SCANNER

NEWSLETTER OF THE AMERICAN SOCIETY OF HIGHWAY ENGINEERS

Fall 2003-4

Ohio Adopts Smoothseal: A Thin-lift Asphalt P.M. Strategy

James P. Jurgensen, TRIKO Valley Chapter ASHE President

Preventive maintenance is a topic of much interest around the country as DOTs do their best to get the most out of aging roads under increasingly tight budgets – and for good reason. A P.M. treatment on a pavement exhibiting surface distress today can prevent the need for more radical measures in the future, and at a fraction of the cost.

For many pavement engineers, microsurfacing and chip seals are the "defaults" when considering preventive maintenance treatments. In Ohio, however, these aren't the only options. In fact the Ohio Department of Transportation is finding that a thin asphalt overlay—or Smoothseal, as the material has come to be known in the Buckeye state - can provide a cost-effective answer to pavement preservation.

ODOT Supplemental Specification 854, Fine Graded Polymer Asphalt Concrete – dubbed "Smoothseal" is a non-proprietary material comprised of a blend of high-quality aggregates with a polymer-modified asphalt. Longevity was a primary goal in ODOT's development of Smoothseal and as such polymer modification was a must. Smoothseal can be placed as thin as three-quarters of an inch and has demonstrated the ability to preserve the life and drivability of structurally sound pavements.

ODOT Smoothseals US Route 23, Lucas County, as part of nighttime paving project.

Why Smoothseal was added to the Platter of Ohio's other Preventive Maintenance Treatements

One answer is cost. In July of last year, ODOT let to bid US Route 23 in Lucas County near the Michigan state line, inviting bids for asphalt and microsurfacing preventive maintenance processes. Gerken Paving of Napoleon, Ohio submitted a bid for placing a 1-inch thick Smoothseal, which came in 20 percent cheaper than bids for a double-course microsurfacing.

Cost is not the only reason Smoothseal is being used. Smoothseal improves ride quality by correcting minor rutting and filling in surface depressions. This improvement to ride quality has been duly noted by pavement engineers. Because Smoothseal is a product placed using an asphalt paver free-floating screed, cross-slope is restored and drainage improved.

An advantage of Smoothseal over that of surface treatments is the fact that by adding additional thickness in the form of a thin asphalt overlay, you will increase the structural strength of the pavement. This means Smoothseal does more than just solve short-term pavement degradation and ride issues. Albeit the additional thickness the treatment provides is nominal, however it does serve to make the pavement structure last longer and increase its load carrying capacity. The reason for this is simple. As pavement thickness increases, pressure per square inch on the subgrade decreases, thanks to the increased size of the load's footprint.

As previously mentioned, ODOT's objective in developing Smoothseal was to obtain greater surface life. To accomplish this end, polymers have been added to the mix to provide enhanced wear resistance and resistance to weathering. SBR latex asphalt mix has been used on Ohio highways for the past 30 years, and more recently SBS asphalt mixes have been prevalent. The performance history of these pavements has given ODOT confidence that polymer modified asphalt mixes result in longer surface life.

Smoothseal is a fine-graded material, and it takes advantage of the positive ride attributes associated with asphalt paving. The free-floating screed of the asphalt paver allows the material to compensate for the roughness of the pavement by filling in the low spots and trimming off high spots. The use of polymers

"Smoothseal" continued p. 7

Thank you

I want to thank all of the ASHE membership for your support and help during my term as President. What a wonderful experience...all the new friendships...great visits with many of you...new ideas for ASHE.

This year we looked into the future and saw a need to refocus and redirect our energies to make ASHE the vibrant, professional National organization all of you expect. We are attempting to do this by reexamining our Strategic Plan in order to give a clear and defined direction to our organization.

We have identified the need to focus on establishing New Sections and growing our existing Sections with new members. The New Section Committee has reworked the New Section Startup Procedures so that a clearer understanding of the guidelines is available to the New Sections committee members and potential leaders of New Sections.

Another direction for our attention deals with our image and our need to be nationally recognized and respected as a force in the highway industry. Many of you have expressed an interest in having ASHE's voice heard on highway concerns at the Federal and State levels. The National Board members, with the help of Section leaders, are exploring possible contacts at all levels of government so we do have our ideas, comments and recommendations as part of the record.

As I have visited the numerous Section and Regional events this year, I have been so impressed with the people I have met. I want to say a special thank-you to all the Section and Region officers, as well as the National Board officers, for all your time on behalf of ASHE. The time, your free time in many cases, that you give to ASHE and ASHE functions, is inspiring.

Such talented, enthusiastic and dedicated folks we have in our organization – I am so proud to be part of ASHE.

Thank you all again.

Sandy Ivory
ASHE Past President

National Board News

National board members met for a regular board meeting on October 25, 2003, at the Hilton Hotel in Christiana, Delaware. National President David W. Jones, P.E. presided over the meeting. The following are highlights of the committee reports and board actions:

Secretary's Report

There was a decrease of 138 members since the June board meeting, as reported by Secretary Conner. Total ASHE membership stands at 5,400, representing 34 local sections.

President's Report:

President Jones had attended the Triko Valley Section Meeting on September 30, 2003, and provided opening remarks at the Region 6 Seminar at the College of New Jersey on October 21, 2003. This very successful Seminar was attended by over 300. He is scheduled to attend many Section Dinner Meetings and Recognition Banquets throughout the coming year.

Legislative Review:

Director Perry Schweiss discussed ways to expand the committee's involvement and effectiveness outside the board. Sections are encouraged to support local, state and federal transportation organizations to increase their effectiveness in promoting the interests of the highway industry. Currently many sections are active in organizations that monitor and provide support to legislative activities at these levels of government. It was noted that ASHE National also provides up to $500 per year, per Region for society exposure.

Director Schweiss noted that on September 30, 2003, President Bush signed a 5-month extension of the nation's surface transportation law (TEA-21). This extension takes place beginning October 31, 2003 and will expire on February 29, 2004. The extension law provides $14.4 billion for five months of spending on highway programs at a rate of $33.8 billion compared to $31.6 that was provided in FY 03.

Public Relations/Membership Committee:

Director Steven Tidwell reported on the Committee's goal to develop a list of ten ideas for a marketing plan and ten ideas on increased membership. The committee discussed the two ASHE display booths that are made available for use through Wanner Associates, and will look into updating the booths and the ASHE Sections/Regions Map. Also, the committee will finalize a "standardized" version of the ASHE crest and develop an ASHE logo that includes the crest. Tidwell passed around a 1½ " ASHE crest that the Tampa Bay Section developed for the plaques that they use to recognize sponsors. The committee will develop a one page "shopping list" for the website to order ASHE materials.

Conference Committee:

Director Robert Hochevar provided a report on the Conference 2003 profits and provided a check for the ASHE National distribution.

Director Steven Tidwell reported that the Conference 2004 Website is linked to the ASHE National home page and an article on the conference will be included in the Fall SCANNER.

Director Perry Schweiss reported that the conference committee for Conference 2005 in Pittsburgh, PA is considering having educational seminars/technical sessions on Thursday to entice early participation.

Continuing Education Units (CEU's):

Director Richard Prentice reported that an IACET reviewer performed a rather detailed site visit to determine ASHE's compliance with IACET's standards and to examine the processes that ASHE put in place to administer and issue IACET CEU's. By letter dated October 17, 2003, ASHE was approved and will receive its certificates.

Director Prentice petitioned the board and was approved to begin executing a training plan to visit all 9 regions by June 2004. Sections will coordinate the issuance of CEU's with the National CEU Committee and will receive an electronic version of the certificates for distribution.

Strategic Plan/Operations Oversight:

Past President Charles Flowe conducted a special meeting on October 24, 2003 to review and finalize the "2003 – 2006 American Society of Highway Engineers, Strategic Plan". The board adopted the strategic plan at the October 25, 2003 board meeting and will post it on the National website. The board discussed establishing a set of measures that will be reviewed at each meeting to ensure the timely delivery of action items. President Jones thanked Charlie Flowe for his efforts in completing the plan along with the assistance of the entire board.

Website Committee:

Directors Robert Hochevar and Robert Peda discussed progress that was made in providing a way for consultants, contractors and suppliers to advertise and/or place a link to their companies on the ASHE National Website. Procedures are being finalized with Wanner Associates and an annual advertising rate of $200 per year was established. A separate web page will be created along with instructions for new firms to advertise. So far three companies requested to participate.

Director Hochevar reported that the website was updated for current National Officers and Section Secretaries; several updates to the Section Operating Manual were completed; and, a link from the home page was provided to the ASHE Conference 2004, ASHE Region 6 Technical Workshop and the International Conference on Highway Pavements. So far, twelve section websites are linked to the National website, as follows: Lake Erie, Pittsburgh, Harrisburg, Altoona, Williamsport, First State, Potomac, Chesapeake, Old Dominion, Carolina Piedmont, Carolina Triangle, and Gold Coast. Also, the Region 6 website is linked. ■

Call for Presentations

American Society of Highway Engineers
ASHE 2004 Annual Meeting and Exhibit
June 16-20, 2004
Marriott Sawgrass Resort
Ponte Vedra Beach, FL

Abstracts due by January 15, 2004

The American Society of Highway Engineers invites you to submit an abstract of a paper that you would like to have considered for presentation at the ASHE 2004 Conference and Exhibit to be held in Ponte Vedra Beach, FL, USA, June 16-20, 2004.

Possible Topics

The following is a list of probable topic areas. You will need to assign your abstract to one of these topic areas.

- Transportation Security Issues
- TEA-21 Re-Authorization Synopsis
- Public/Private Partnerships
- State DOT/Local Partnership
- Environmental Streamlining
- Design/Build-Lessons Learned
- Fast-Track Design and Construction
- Mega-Projects
- Innovative Contracting Methods
- Maintenance Management Systems
- Traffic Calming
- Pedestrian and Bicycle Safety
- Asset/Resource Management
- Transportation Financing

Submittals

Preferred Method: Please e-mail to ASHE 2004 Technical Programs at janglin@hntb.com. Send an electronic copy of your abstract in PDF or MS Word format. Your abstract should be a maximum of 250 words in length. You also will be required to identify the topic of your abstract from the previous list. In the event that you do not have access to the Internet or an e-mail address, send your abstract to:

2004 Technical Program
ASHE
c/o Jim Anglin
HNTB Corporation
1615 Edgewater Drive
Suite 200
Orlando, FL 32804

Your one-page abstract should be a maximum of 250 words in length. Complete professional contact information, your name, title, organization, mailing address, phone number, fax number and e-mail address must appear in the text of the abstract.

Deadlines

Abstracts must be e-mailed or received by postal mail no later than January 15, 2004. For those persons without Internet access or e-mail addresses, your abstract must be received no later than January 15, 2004. You will receive an acknowledgment of your submission(s) on or before February 15, 2004. You will be notified by March 1, 2004, as to whether your abstract has been accepted for presentation. ■

AMERICAN SOCIETY OF HIGHWAY ENGINEERS
2004 NATIONAL CONFERENCE
June 16-20, 2004
Sawgrass Marriot Resort Beach Club
Ponte Vedra Beach, Florida
http://ashe2004.org

Discover Florida's First Coast...
History, Culture, Sightseeing, Shopping, Dining, Waterways, Beaches, Recreation!

Help Start New Sections

Ron Purvis, Chair, New Sections Committee

National highway policy is of great importance to our membership. Increased influence in policy formulation is an ASHE goal. Our new strategic plan identifies geographical growth as a major priority in improving national recognition and influence. Geographical growth requires chartering new sections. Ideally, this expansion would occur in states along the perimeter of existing section boundaries. However, if there is sufficient interest new sections may be chartered anywhere.

Our organization has traditionally expanded as members move to a location without a section. Interest in a new section is also stimulated by "word-of-mouth" between branch offices and other highway contacts. We recognize the value of our organization for professional growth and networking. There is no quicker way to integrate into a local highway community than involvement in chartering a new section.

Your National Board is available to help with new section start-up. The first step is to identify a local champion or champions who will contact and help organize charter members. The National Board is available to work with local champion(s) to organize and lead a start-up meeting.

High priority new section start-up locations include: Columbia, SC; Nashville, TN; Southern Florida; Boston, MA; NYC, NY; Charleston, WV; and Texas. The key part of the process is identifying a local person interested in helping at these, or other, locations. We need your help in identifying potential candidates. Please contact your National Director with suggested locations and a name of a local candidate to help. National will take it from there unless you choose to remain involved. You may also contact the chair of the New Sections Committee - Ron Purvis (703)378-0321 or ronpurvis@erols.com. Ron is also available to answer any questions regarding new section start-up. Thanks for your support. ■

"Smoothseal" continued from p. 1

and crushed stone in the mixture enhances its stability and stiffness. A silicon dioxide requirement for the sand portion of the mix helps ensure good skid resistance.

Flexible Pavements of Ohio, the trade association for the state's asphalt industry, presented its 2002 "Master Craftsman Award" to a pavement in the City of Shaker Heights. The award was presented for the paving of Shelburne Road – a pavement that was surfaced with Smoothseal and provided 28 years of service. The Master Craftsman Award is the association's highest honor, recognizing projects that demonstrate the best characteristics of asphalt paving, especially those with long service lives. The product used in this project has come to be known as Smoothseal "Type A."

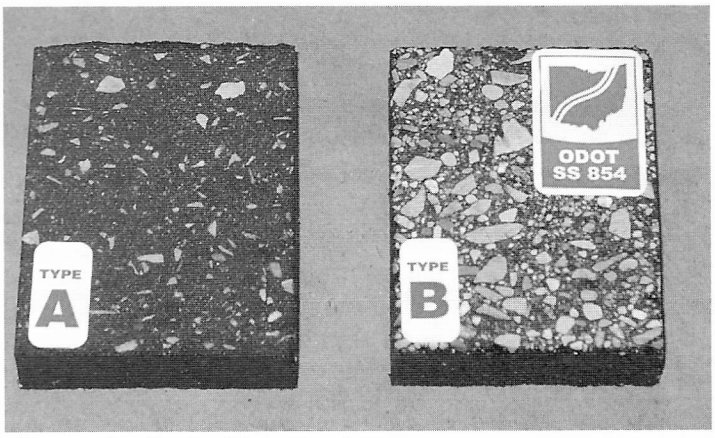
In 1993, the industry introduced Smoothseal "Type B" on an experimental project in Logan County. Smoothseal "Type B" was designed for both moderate and heavily trafficked pavements. It uses 100 percent two-faced crushed coarse aggregate, which acts to provide internal friction to the mix, and therefore greater stability. PG 76-22M ("M" is an ODOT designation indicating polymer modification), SBS polymer modified asphalt binder or SBR latex rubber polymer is added to improve Smoothseal "Type B" resulting in a toughness superior to finely graded hot mix asphalt.

The interest in Smoothseal continues to grow. Last year Flexible Pavements of Ohio sponsored workshops to expose city and county engineers to preventive maintenance using ODOT's Smoothseal product. Since that time local governments in Ohio are adopting the material as another tool in their preventive maintenance toolboxes. The most recent is the City of Wooster which has taken keen interest in the material and constructed projects.

Interest in Smoothseal is growing on a national level as well. Ohio industry leaders are getting requests from other states and the National Asphalt Pavement Association to share Smothseal's success story with a broader audience.

The Ohio Department of Transportation's Fine Graded Polymer Asphalt Concrete (a.k.a. Smoothseal) is no "silver bullet," however it has struck a cord with pavement maintenance engineers seeking long-term preventive maintenance fixes. ■

Smoothseal placed in residential application, City of Englewood, OH



Cross-sectional cuts of Smoothseal types.

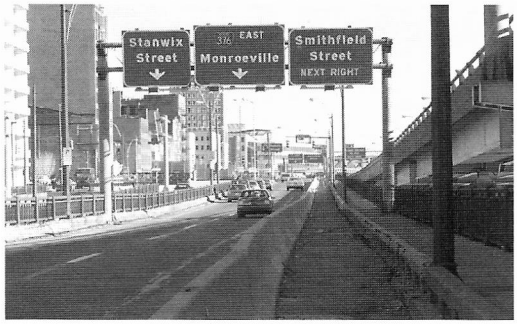
Constructing a Missing Interstate Link in Downtown Pittsburgh

By Glenn D. Stickel, PE
Pittsburgh Section
Project Manager, SAI Consulting Engineers, Inc.

When the Fort Duquesne Bridge over the Allegheny River was opened in 1968, traffic flow from points north of Pittsburgh was greatly improved. Motorists now had convenient access to downtown Pittsburgh and the Fort Pitt Bridge. However, to connect to I-376 East (know locally as the Parkway East), vehicles were forced to use a local street (Fort Pitt Boulevard Eastbound) and negotiate a series of 3 signalized intersections.

The demand on Fort Pitt Boulevard increased to over 15,000 ADT with the connection of I-279 Southbound to the Fort Duquesne Bridge in 1985. Traffic flow was compounded in the mid 1990's when the right lane of the Fort Pitt Boulevard viaduct was closed due to structural deterioration, reducing the three-lane cartway to two lanes.

Pittsburgh city officials were faced with the burden of an aging, deteriorating structure that played an important role in the traffic network in the Mon Wharf corridor. Through a collaborative effort between City and PennDOT engineers and planners, a creative solution was developed — reconstruct the Fort Pitt Boulevard viaduct in such a way as to provide a dedicated interstate lane, separated from local traffic. Thus, traffic from I-279 and the Fort Duquesne Bridge could access I-376 eastbound unimpeded by traffic signals and weaving with downtown traffic.



Schedule

Once the decision was made to proceed with the "Interstate Connector" project, the focus turned towards planning and scheduling. PennDOT was already in the process of reconstructing the nearby Fort Pitt Bridge. It was ultimately decided to phase the Fort Pitt Boulevard/Interstate Connector project within the framework of the Fort Pitt Bridge timetable.

The two main stages of the Fort Pitt Bridge project were scheduled to occur in 2002 and 2003. It was decided to reconstruct Fort Pitt Boulevard in 2002, concurrent with the "outbound" portion of the Fort Pitt Bridge, so that the newly constructed Interstate Connector would be available as part of the detour route for "inbound" Fort Pitt Bridge traffic in 2003.

In 2000, the City of Pittsburgh selected a final design team lead by prime consultant SAI Consulting Engineers, with key assistance from Michael Baker Jr., Inc., and final design began in November of that year. To take full advantage of the available calendar time in 2001 (for design) and 2002 (for construction) it was decided to bid the construction phase as two contracts.

A demolition contract was bid in October 2001. The contractor, GASA, Inc., removed the superstructure and portions of the substructure on the main viaduct as well as the adjacent Market St. Bridge. Work began in January 2002 and was completed by April 2002, thus providing a clear site for the second contractor to immediately begin foundation construction.

The second construction contract was bid on February 28, 2002 and was awarded to Brayman Construction Corp. Construction began April 29, 2002.

Due to the importance of completing this project with respect to the second season of the Fort Pitt Bridge project, the contractor was required to meet a series of six milestone dates.

Innovative Bidding was utilized. The AA-B Method@ (a modified version of the usual A+B method) allowed the bidders to present a time factor in addition to price. Selection of the low bidder was based on the dollar amount of the bid (A) minus the time factor (B).

Incentive/Disincentive provisions were also included in the contract. For four of the milestones (1, 4, 5 and 6) the contractor was entitled to earn an incentive for each day of early completion (with a maximum of 15 days each); conversely, disincentives would be charged for each day of late completion. Brayman successfully completed each milestone by the maximum early completion date, thus earning the full incentive.

Project Details

This project involved the reconstruction and/or rehabilitation of seven bridges (including the 1900' main viaduct), one retaining wall and one tunnel, along with associated improvements to the adjacent approach roadways. The construction cost was in excess of $34 million ($2.67 million for the demolition contract and approximately $31.5 million for the reconstruction contract).

The focal point of the project was reconstruction of the 1940-vintage Fort Pitt Boulevard Eastbound viaduct. Originally a 37-span structure that terminated at Smithfield St., it was rebuilt as a 35-span bridge that now passes beneath the Smithfield St. Bridge. The original cartway had three lanes of traffic and one sidewalk. On the reconstructed deck, traffic has been separated to provide a dedicated Athrough lane@ that creates direct access from I-279 Southbound (from the Fort Duquesne Bridge) to I-376 Eastbound, and two lanes of local traffic. To accommodate the local traffic connection to the Smithfield St. Bridge and points east, a new 3-span bridge was constructed from Wood St. to Smithfield St.

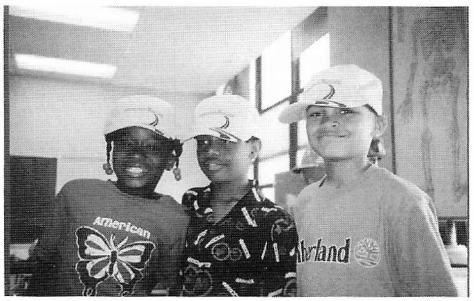
Reconstruction of the piers was a significant structural aspect of the project. The original 2-column concrete piers were modified by removing the concrete cap, constructing a new center column (slightly offset from the centerline, to allow parking operations below) and a new concrete cap (supported on the original columns with pot bearings and rigidly attached to the new column, to attract more load to the new foundations).

"Ft. Pitt" continued p. 19

Kids Explore Transportation Construction Industry at Summer Camps

by Laura Brightbill

It is no secret that the transportation construction industry is suffering from a shortage of qualified workers. Two major contributing factors include an aging workforce, and very little education offered to young students to foster excitement for careers in construction. The Associated Pennsylvania Constructors (APC) responded by creating a workforce development initiative to cultivate interest in the transportation construction industry with children in the Harrisburg, PA area. APC partnered with the Harrisburg Chapter of the American Society of Highway Engineers (ASHE) in an effort to recruit members to become involved in a series of math and science camps to achieve the goals of the initiative.

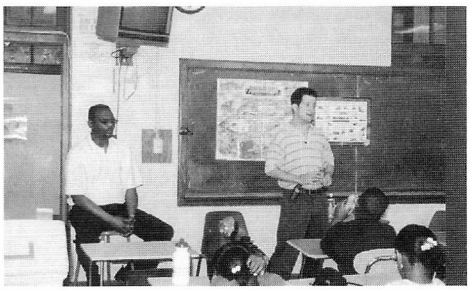


Campers proudly show off hats they won for correctly answering questions about bridges.

The youth programs, held at both Camp Schikellimy in upper Dauphin County, and the William Penn Campus in Harrisburg, were organized by APC and the Camp Curtain YMCA. The camps featured a variety of math and science projects relating to highway, bridge, and building design and construction. Seven APC/ASHE members from Harrisburg area engineering firms teamed up with four volunteers from PennDOT and three volunteers from APC's staff to serve as instructors.

Thanks to a generous grant by the APC Educational Trust Fund (ETF) Trustees, funds earmarked for promoting careers in transportation construction were used to purchase the curriculum programs used at the camps. The instructional programs, entitled *Build-Up!* and *On Site!*, were developed by the Associated General Contractors (AGC) of America in partnership with Scholastic Publishers. The programs are in the form of large plastic toolboxes, and include a wide assortment of valuable hands - on math and science related lessons. Activities included in the kits are the construction of popsicle stick bridges to teach the strength of varying geometric shapes; the mixing of concrete to show the use of chemistry in highway construction; and a lesson that employs an instructional video, a book, and a crossword puzzle to explain the multitude of careers available in the transportation construction industry. Volunteer Crystalann Harbold of Johnson, Mirmiran & Thompson noted, "Through our mini-discussions, activities and the bridge video, we opened their [students] eyes to all the possibilities available in the construction industry."

Camp commenced on July 7, 2003, and lasted for four weeks. Camp Schikellimy was a residence camp, accommodating nearly 90 children over the three weeks that the math and science sessions were held there. The Harrisburg camps at William Penn were also well attended with about 70 children participating in the camps over the four-week period.



Volunteers Brian Fraley, (standing) of APC and Donald Cox, PennDOT respond to questions about various machines used in construction.

All told, the volunteers, along with APC and the YMCA, were able to enlighten 160 children about the worlds of transportation construction and civil engineering. When asked why he volunteered, Gannett-Fleming's Nicholas Siegl responded, "I volunteered because I get a lot of satisfaction out of my job designing highways and bridges, and believe most kids in Harrisburg would also get pretty excited about this type of work if someone would take the time to tell them what it's all about and where the opportunities are." He and his counterparts who volunteered their time played a part in triggering the beginning of a very bright future for the transportation construction industry. ■

Camp Volunteers

(Members of ASHE-Harrisburg Section):
Rebecca Burns, P.E., PennDOT
Brian Fraley, APC
Ron Geist, APC
Crystalann Harbold, EIT, Johnson, Mirmiran & Thompson
Steve Karl, P.E., Johnson, Mirmiran & Thompson
Terry Linsey, PLS, Buchart-Horn
Brehan McBride, Gannett-Fleming
Erin O'Brien, EIT, Greenhorne & O'Mara
William Pickering, P.E., So-Deep, Inc.
Nicholas Siegl, P.E., Gannett-Fleming

(Non-ASHE Member Volunteers)
Laura Brightbill, APC
William Kerney, PennDOT
Donald Cox, PennDOT
Steve Davidheiser, PennDOT

Special thanks to:

Kim Meyers at Pennsy Supply for giving the students a guided tour of Pennsy Supply's quarry in Hummelstown, PA.

Cleveland Brothers Equipment Company for donating an "I Love Cat Machines" video to teach the children about construction equipment.

How You Can Get Involved

The Build Up! and *On Site!* kits can both be purchased for individual use, or can be sponsored by a company for a specific classroom, such as APC-sponsored kits for the summer camps. If you are interested in purchasing or sponsoring a kit, call the APC office at (717) 238-2513, or go to www.agc.org and click on Education and Training – Construction Futures.

The American Society of Highway Engineers
North-East Penn Section

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PennDOT Engineering District 10 Construction Unit Implements a Quality Management System

H. Daniel Cessna, P.E., Assistant Construction Engineer, PennDOT and Charlie Cianfrani, ARBOR E&T, LLC.

On July 22, 2003, PennDOT Engineering District 10 Construction Unit was certified as meeting the requirements of International Organization for Standardization (ISO) 9001:2000 by KEMA-Registered Quality, an ANSI-RAB NAP accredited organization. PennDOT Engineering District 10 is the first District in the State to receive the ISO 9001:2000 certification. The District's Construction Unit received the official certification for its Quality Management System (QMS) in construction activities. ISO certification is a rigorous process that requires a third party external audit. The Construction Unit underwent this audit process in June, 2003, to determine its degree of conformance to ISO standards. The goal was achieved through the establishment of a QMS for all operations associated with the Construction Unit including field services and office support.

District 10's Construction Unit, led by Joseph J. Szczur, P.E., Assistant District Executive for Construction, is tasked with the responsibility of managing and inspecting contract work on State roadways and bridges in Armstrong, Butler, Clarion, Indiana, and Jefferson counties. The Unit employs 83 people in 7 functional areas and has the responsibility for ensuring that all road construction in the District is performed in accordance with Federal, State and Local regulations in addition to adhering to all contract mandated requirements. About 25% of the personnel are engineers, 65% are technical and management staff directly involved in road construction with the balance being support staff attending to the many fiscal and administrative aspects of highway construction. By earning ISO 9001 certification, the District is ensuring that quality is integrated into the processes used to monitor contractor activities and administer contract requirements. Quality certification also helps to ensure that Commonwealth residents get efficient and effective use of their tax dollars. This year, the District has nearly $200 million in transportation improvements underway.

The organization pursued the development of an ISO compliant QMS in an effort to consolidate quality management systems, processes, and philosophies into a globally accepted standard set. As a result of this all of the unit's business planning processes, process mapping, key process investigations, measurement systems, and customer inquiry and complaint handling and tracking have been consolidated into one management review process focusing on continual improvement.

Aside from the conventional activities such as forming an implementation team and performing a gap analysis, we identified our key processes and sub-processes for every activity within our scope of responsibility. Those responsible for each key process started with the existing in-place process map or a blank piece of paper; all inputs to the process were identified, the activities were evaluated to ensure internal and external customer requirements were met, and the expected outputs from the process were identified. To demonstrate that the outputs conform to requirements and to ensure that the process was performing to expectations existing metrics were evaluated and revised or created if necessary. We also identified all interfaces and all records that were required by State or contract mandate.

At this point, process flow charts or process maps were developed, except for the simplest processes. We decided that it was a worthwhile investment to document most processes with detailed procedures since the act of writing the procedures provided a check to ensure that all activities were adding value and to provide a reliable reference to train new personnel. In the end, 23 QMS processes and 33 Product Realization processes were developed. Most of the documentation is 2 pages or less (one of our guidelines, since longer documentation is difficult to follow consistently) with an accompanying flow chart. Our system was developed in a manner that others could easily copy or emulate. Additionally, our entire QMS is electronic, to avoid redundancy of paper copies with varying updates.

Procedural aspects of the project implementation such as developing a quality policy, defining and setting objectives, setting-up corrective action and implementing management review were handled in such a way that avoided any duplication of effort. Richard Polenik, Assistant Materials Manager, was assigned as our management representative to coordinate and implement our QMS. After implementation, Lisa Andrus-Peace, District Quality Coordinator, has been working closely with the Construction Unit to insure various aspects of our QMS are handled effectively.

It took 8 months from project start to certification. No additional manpower and limited use of consulting helped to ensure we defined and stayed on an efficient path to implementation. Consultant help was most useful in structuring the project, in providing initial training, in conducting Internal Auditor training for compliance and improvement and in providing a check on the extent and detail contained in our documentation.

Costs that had been readily absorbed in the past were now traced back to root cause in the QMS. We asked, "when this unexpected cost was created, where did our ISO QMS fail? Did we have a quality process for this item? Did we follow our procedures and still endure the cost? Did we fail to follow our own procedure or process?" Using this logic, we have a repeatable and rationale method to cut costs.

Achieving ISO 9001:2000 compliance was an exhilarating journey, accompanied by a less than expected level of resistance throughout the organization. Long term employees (many of our staff have over 20 years experience), SAP implementation, an unusually high construction portfolio and several other factors could have been the basis for resistance. But our team chose to "just do it". As one of our staff said ..." if the ISO process is viewed as meaningful for 600,000 mostly private sector organizations, we should be able to use it effectively here."

The good news and the bad news is that in going through the process, we identified many more improvement projects than we have time or resources to attack. But through time we will attack these as well and the Management review process is our vehicle for setting priorities and allocating resources.

A quality manual was developed to create uniform processes that integrate quality into all aspects of the Construction Unit. The manual is available for public review on District 10's website by going to www.dot.state.pa.us, click "Regional Information," click "10," click "District 10 Initiatives," and then "Construction ISO 9001 Manual." ■

iFlorida Shines the Nation's Spotlight on Florida's Transportation System

L.A Griffin
Manager, Expressway Operations
Orlando Orange County Expressway Authority (OOCEA)

Earlier this year, the Federal Highway Administration awarded an Intelligent Transportation System "model deployment" grant to the state of Florida to demonstrate the value of transportation system conditions information. Florida DOT competed against 16 other states in winning this highly innovative model deployment grant, officially titled the "Surface Transportation Security and Reliability Information System Model Deployment," and proposed a $21 million project, called "iFlorida." OOCEA is one of many partners working with Florida DOT to bring this project to fruition. This article provides an overview of the iFlorida project.

Project Elements

Over the past few months, we have been refining the concepts proposed in our application to FHWA to deliver the project in the most expeditious, cost-effective and risk-managed manner. When completed, key accomplishments of iFlorida will include:

- The monitoring of travel times on all limited access highways in the Orlando area;
- The monitoring of travel times on roughly half of the key arterial mileage and video on monitoring of all key intersections in the Orlando area;
- The complete monitoring of the SR 528 evacuation corridor, which is one of the state's five approved emergency contra flow (one-way) corridors;
- Statewide reporting system aggregating in one system significant safety and capacity restricting conditions along the Florida Intrastate Highway System;
- Statewide 511 traveler information telephone system and enhancements to the existing Central Florida 511 system to include all monitored roads, transit and airport information;
- Statewide traveler information web portal and enhancements to the Central Florida regional web site to include all available information;
- A one-stop source for third parties that wish to access and utilize iFlorida data, either for real-time or historical applications;
- Enhanced weather information specifically tailored for transportation uses, available to both agency operators and the traveling public; and
- Security monitoring on two critical bridges in Florida.

For more detailed and current information on iFlorida, please visit the iFlorida project web site at www.iflorida.net.

Project Schedule

Initiated on May 1, 2003, there is a two-year design and deployment phase, followed by a two-year operational evaluation period in which the cooperative agreement between Florida DOT and FHWA dictates that all project elements shall be operational between May 1, 2005 and April 30, 2007, to support the national evaluation that will be ongoing during this period. Afterwards we anticipate that most of the iFlorida project elements will become permanent fixtures supporting transportation operations in Florida. By May 2005, iFlorida will be serving users of Florida's transportation system by providing safer and more reliable travel. ■

The Serious Business of Birdwatching

Bob Muir, P.E. of First State Section of ASHE
Harry Roecker of DMJM+HARRIS

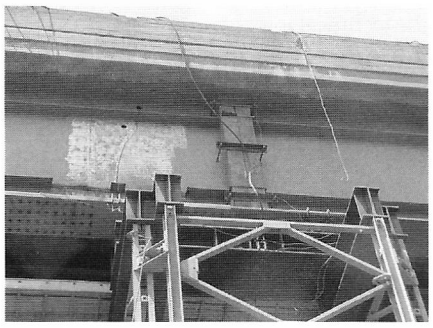
By their very nature, birdwatchers are meticulous observers. In this case, that diligence proved to be a lifesaver.

Looks can be deceiving. And by most appearances, the bridge over Brandywine Creek on I-95—a stretch of interstate that carries 100,000 vehicles daily—looked fine. That is, until a birdwatcher wandering through Brandywine Creek State Park happened to look up from his position below the bridge. He discovered daylight glinting through an inch-wide crevice between the span and one of its supporting girders. Not exactly sure of the implications of his discovery, the birdwatcher called the Delaware Department of Transportation (DelDOT).

Knowing exactly what that observation could mean, DelDOT officials responded to the scene within minutes. As soon as they examined the bridge, DelDOT officials knew they had a serious problem on their hands: An acute fracture had stretched the exterior girder supporting the northbound traffic lanes of the I-95 Brandywine Creek Bridge.

"I couldn't sleep that night after seeing the crack," explains DelDOT Bridge Engineer Jiten K. Soneji. "I still remember that night. Our main concern was the first interior girder. We didn't want the first interior girder to get overstressed. Everyone was asking why and how this happened. I told them, 'At the moment, "why" is my least concern. I'm most concerned about what we can do to keep our motorists safe."

DelDOT immediately closed the third, outer lane of traffic. Upon deploying an Under Bridge Inspection Vehicle (UBIV), it quickly became clear that this crack was no minor anomaly. The 8-foot-deep steel girder had cracked from its bottom to approximately 7 inches from its top. The edges of the crack had widened to approximately 1 inch at the bottom of the girder, and the girder had dropped almost 2 inches from its original position. But DelDOT needed more in-depth information. They had to determine whether the bridge could remain open at all.



This bridge carries I-95—and 100,000 vehicles per day—over Brandywine Creek in Wilmington, Delaware.

"We assessed the load-carrying capacity of the damaged bridge. And the analysis revealed that the bridge could safely carry only two lanes of traffic until permanent repairs of the girder were completed," explains John Milius, P.E., a senior structural engineer for DMJM+HARRIS. "But we needed to apply a temporary fix as well. What we really wanted to do with this temporary fix was to arrest the progression of that crack. We did not want to lose the girder. If we were able to close that crack, we knew that we could restore the girder to its original strength."

Even before the crack came to light, a project team consisting of DMJM+HARRIS, contractor Greggo & Ferrara, DelDOT, and the Federal Highway Administration (FHWA) was already performing repairs and architectural improvements on the bridge. In addition to creating concrete barriers with synthetic stone and adding ornamental street lighting, the project team was repairing severely spalled parapets and median joints. Originally the work was to be done in two phases. Phase I called for the third traffic lane to divert to the outside shoulder. Phase II would shift traffic toward the median to allow for construction work in the shoulder. But as soon as the crack was discovered, the girder repair became the top priority. The JD Eckman firm was added to the team, specifically to fix the cracked girder. But a question naturally arose: with engineers actively working on the bridge, how could a crack like this go unnoticed? Milius explains.

"There had been a bridge inspection just two months earlier and this crack was not discovered. At that time, it could not have been visible. Something of this magnitude—even something much smaller than this—would certainly have been discovered. So, once this crack began to form, it must have progressed very quickly, probably within a matter of a few days. Fortunately, someone in the park just happened to see it and had the excellent good sense to call DelDOT when they discovered it."

Later inspection proved Milius's belief to be correct. The steel girders are I-shaped elements constructed of a vertical plate (or web) located between top and bottom flange plates. Analysis revealed that the crack began in a weld in a nonstructural stiffener plate attached to the web of the girder on its outside vertical face. During construction of the bridge in the 1960s, the weld was used to attach a decorative element to the bridge. Temporary changes in loading caused this weld to fracture. Once the weld cracked, the crack propagated quickly through the girder web and flange. But the analysis revealed more.

The decorative weld that fractured was not unique to one point on the girder; similar welds existed every 25 to 30 feet along both sides of the 1,875-foot bridge. Milius and his project team inspected the entire bridge for evidence of similar weld failures. It took two weeks, but every problematic weld was located and drilled out of the structure. But before that could be completed, the girder problem needed to be addressed.

To immediately arrest the progress of the crack, the project team drilled several small-diameter holes at the tips of the crack. Then, using specially fabricated steel splice plates, the project team reunited the bottom flange of the steel girder. Less than 48 hours after the fracture was discovered, the project team had the plates securely in place and had ensured the temporary safety of the bridge. Now it was time to make the temporary repairs permanent.

A team of researchers led by Dr. Michael Chajes—Chair of the University of Delaware's Civil and Environmental Engineering Department—began to test the amount of live load (strain from vehicular and truck traffic) that was stressing the bridge girders and the temporary splice. After clamping strain gauges onto the fractured girder as well as onto undamaged nearby girders, the team brought in large trucks with specific, known weights. Results from the damaged northbound lanes were compared with results from the undamaged southbound lanes. The tests revealed that the live load was being distributed to the bridge girders normally; the temporary splices were helping the fractured girder function normally. That addressed the live load. But what about the weight of the bridge itself? Again, Milius explains.

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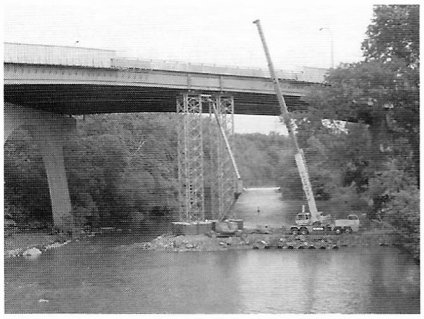
"We improved the girder to take the live load. And that saved the girder. But the one thing that we hadn't done in the temporary fix was to restore capacity for the 'dead load,' the weight of the bridge itself. The only way to bring this load capacity back was to restore the girder to its former position, and that's the main difficulty with a permanent fix. We had to find a way to get the girder back into its original position."

A challenge unto itself, there was added pressure as well. The July 4 holiday weekend—a period of extremely high traffic volume—was only weeks away. Any permanent solution had to be as quick as it was effective.

"What was unique about this was that we were already under contract," explains Lance Wilgus, P.E., the project engineer for FHWA. "When you have something unexpected like this come up, your main focus has to be the safety of the traveling public; you have to fix the problem. But if at all possible, you also want to make sure that you don't delay the original project that is under way either." Every day of delay costs people time, lengthening their daily commutes. Getting the emergency repairs done before July 4 would make sure that the original project wouldn't get delayed either, and it would keep all three lanes available for one of the busiest travel times of the year.

Executing the repairs meant that the project team would have to jack the mammoth structure. They considered five options for this challenging task: (1) lifting the bridge using a beam extended above; (2) jacking with a beam connected to the other girders below the bridge; (3) post-tensioning, with draped cables and lever arms on both sides to lift the girder; (4) jacking the bridge from towers constructed below the fractured beam; and (5) complete girder replacement.

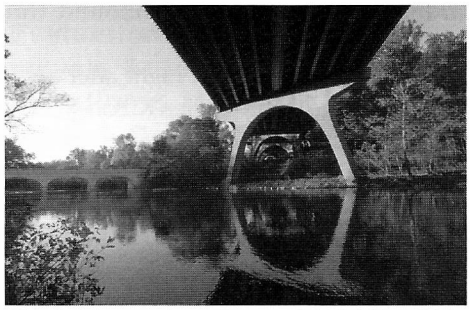
The team quickly determined that both post-tensioning and jacking with a beam were not practical. Complete replacement of the girder would require removing the bridge's concrete deck, a time-consuming and fiscally prohibitive option. Jacking the bridge was the only practical, time-sensitive, cost-effective solution.



This temporary rock island and causeway in the middle of Brandywine Creek were used to access the jacking towers during construction.

Two jacking towers were placed on either side of the crack. Erected from below the bridge in Brandywine Creek, the jacking towers would rise approximately 80 feet from a temporary foundation in the stream. The two towers consisted of four columns separated by 8-foot-long supports. Once the girder was jacked, the permanent repair splice would be attached and minor modifications would be made to the diaphragm crossbeam adjacent to the crack. After quickly obtaining a permit from the Delaware Department of Natural Resources and Environmental Control (permitting the team to secure the towers in the creek), the project team put their plan into action. Working at a frenetic pace, the team completed the permanent splice in time for the July 4 holiday.

In addition to providing holiday travelers with a safe trip, the Brandywine Bridge Project now serves as a platform for education. In a paper presented at the New York City Bridge Conference (Oct. 20–21, 2003), Dr. Chajes documents the contribution this project will make in the study of how load redistributes to other areas when a major area of a bridge is lost.



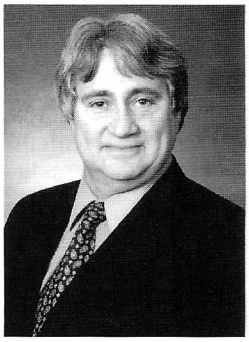
This bridge carries I-95—and 100,000 vehicles per day—over Brandywine Creek in Wilmington, Delaware.

"In addition to the technical insights, this project and this paper demonstrate the clear benefit of joint partnership," explains Dr. Chajes. "And the partnership between the university, DelDOT, DMJM+HARRIS, and the FHWA was invaluable. When something like this happens, the important thing is to fix it quickly. Unfortunately, working at such speed often prevents researchers from studying the problem and its causes. But this project serves as a great example of how both can be accomplished."

FHWA's Wilgus agrees, "This was a great demonstration of how a close partnership can develop an effective solution in an efficient and timely manner. It took a lot of cooperation to make that happen, but the end result speaks for itself. The state was able to implement a repair solution without adversely affecting another project already under way. And that's remarkable."

Close, effective, innovative teamwork made this project successful. But one team member may never know how important his contribution really was. For most birdwatchers, meticulous observation is just part of their hobby. But in this case, that diligence proved to be a lifesaver that actually helped advance the state of the art in bridge repair. And that certainly wasn't for the birds. ■

As the Wheel Turns



Thomas H. Suthers, PE, has been hired as Senior Project Engineer in the Bridge and Structural Department in Burgess & Niple's Dulles, Virginia, office. He brings nearly 25 years of experience in bridge inspections, material testing techniques, structural evaluations, and bridge design. He is responsible for managing bridge design and inspections as well as structural evaluations for public and private clients.

Suthers's past experience includes nearly 4,000 bridge inspections, 600 load ratings, and 70 deck evaluations for various clients throughout the United States. He has managed statewide bridge inspection quality assurance programs. Suthers was lead instructor for National Highway Institute (NHI) training courses in inspection of fracture critical bridge members and bridge maintenance.

Suthers graduated in 1976 from Old Dominion University, with a bachelor's degree in civil engineering. He is a registered Professional Engineer in Virginia and Maryland.

Suthers and his wife, daughter, and two sons have been residents of Prince William County for the past 20 years. Most of his time outside of work is spent with his family and keeping up with his children's activities.

Matthew C. Marquardt,. PE, has been promoted to senior vice president. He had been vice president and deputy director of Urban's highway and bridge division. As senior vice president, Marquardt will oversee the firm's highway, bridge, airports, and site development practices. He is a board member of the American Society of Highway Engineers.

In 1998 the American Society of Highway Engineers Pittsburgh Section established its "Hall of Fame" to recognize members whose service and dedication to ASHE has been exemplary, long-standing, and extraordinary. At this year's Past Presidents Banquet held October 25, 2003, the Pittsburgh Section bestowed this honor to **Lisle E. Williams, PE-PLS** – only the third member (of more than 600 members) in the Section's history to receive this recognition.

Lisle's membership and service to ASHE dates back to 1966 when the Section was established. He is a Life and Charter Member and has served with distinction as Section President, 1st Vice President, 2nd Vice President, Board Director, Chair of numerous Committees, and General Chair or key Committee Member on ASHE National Conferences hosted by the Pittsburgh Section in 1969, 1974, 1984, and 1995. He has served for 11 years as National Director, and is Co-Chair of the 2005 ASHE National Conference that will be held in Pittsburgh.

Lisle represents ASHE on the Construction Legislative Council, was Co-Chair of the committee responsible for upgrading the Society's Section Operating Manual, and prepared updates to the National Conference Guidelines. He has twice been awarded the ASHE Pittsburgh Section President's Award, in addition to ASHE's National President's Award.

Lisle's contributions and dedication, not only to ASHE, but to the engineering profession and the development and betterment of the region's highway infrastructure, spans 39 years. He spent 27 years with the Pennsylvania Department of Transportation and 12 years with various international consulting engineering firms prior to joining DMJM+HARRIS in 1998. The Pittsburgh Office is proud of his contributions and accomplishments, and proud that he's part of our team. ■

"Ft. Pitt" continued from p. 9

Also included was the rehabilitation of the adjacent Stanwix St., Wood St. and Ramp B bridges and the three north approach spans of the Smithfield St. Bridge. The adjacent Market St. Bridge was replaced. The 2400' concrete retaining wall supporting Fort Pitt Boulevard Westbound above I-376 Westbound (Wall "A") was repaired.

Context Sensitive Design was implemented in several elements of the project, including Vierendeel trusses for the sign structures; selective paint colors for sign structures, light poles, bridge girders and steel handrails; and the use of open-type bridge parapets.

Summary

To celebrate the completion of construction, two opening ceremonies were held. PennDOT opened the Interstate Connector on December 6, 2002 and on December 17, 2002 the City of Pittsburgh conducted a ribbon-cutting to mark the opening of the reconstructed Fort Pitt Boulevard Eastbound.

A tremendous amount of design and construction was performed in slightly more than two years. Despite the accelerated schedule, this $34 million endeavor was successfully completed in a high quality manner. ■

Replacement of the Lane Avenue Bridge Franklin County, Ohio

David W. Jones, PE, Central Ohio

With football season fast approaching at the Ohio State University, one can just hear the legendary sportscaster, Keith Jackson saying "Whoa Nelly, what a beautiful fall day for college football in Columbus, Ohio." To most of the 100,000 plus people returning each home game to Columbus, the new bridge on Lane Avenue (Champions Lane) will add to the excitement. While construction of the $15.6M bridge replacement project started in the summer of 2002, most of the visible progress has occurred after the past football season. The new bridge will be a two-span cable stayed bridge that will frame the west campus entrance to the university. Designed by Jones-Stuckey Ltd., Inc. under the direction of the Franklin County Engineers Office, this bridge is the crown jewel of the bridges along the Olentangy River. The CJ Mahan Construction Company of Grove City, Ohio City is constructing the bridge.

In replacing the historic arch bridges along the Olentangy at Third, King and Lane Avenues, the Franklin County Engineer, Dean Ringle, used the public involvement process to sculpt the bridges for the future in the area. In doing so, the County, in cooperation with the Columbus Department of Recreation and Parks, is revitalizing the river corridor by giving the public access to additional green space in an urban environment. This investment of public funds is expected to yield high civic value to the surrounding neighborhoods, which are enjoying a revival. The County leveraged local funds with Ohio Public Works Commission funds and federal funds to create this project.

While the main function of the bridge will be to carry six lanes of traffic, handling pedestrian traffic around the University was a major concern. Two 12' 6" sidewalks will handle the surface pedestrian traffic while four circular staircases make it possible to safely move under the bridge without crossing the six lanes of traffic. The staircases provide for a bicycle track to allow cyclists to walk their bikes to the Olentangy Trail. The two 200 foot spans with the split towers open the underside of the bridge to create a highly visible and safe environment for the pedestrians.

The two symmetrical towers are 118 feet above the roadway surface and 160 feet above the footing. Each tower anchors ten stays. The steel tower anchorages, weighing 48 tons, were the heaviest steel pieces galvanized to date in the United States. The superstructure is composed of reinforced concrete post-tensioned edge girders that support a composite reinforced concrete deck and transverse welded plate floor beams. The 76-foot long welded plate girders were galvanized by double dipping the girders. High durability, a life span of greater than 100 years and low maintenance were three of the many goals of the project. All materials and details were studied to maximize these goals. The reinforced concrete deck will be post-tensioned longitudinally and transversely and be composed of high performance concrete. Stainless steel sconces and precast architectural panels designed by Mark Sherman, the County Deputy Engineer, in addition to specially designed lighting will be featured on the bridge. Mr. Sherman is a past president of the Central Ohio Section. The bridge is scheduled to be open for traffic on November 15, 2003. ■

Moving Lincoln

Robert M. Wright, P.E.
Engineering Manager
City of Philadelphia Department of Streets

The City of Philadelphia has the largest urban park system in the United States. Fairmount Park, the centerpiece of this network, was created in the 19th Century along both sides of the Schuylkill River. It extends from Spring Garden Street north to the Montgomery County border at City Avenue. The park's original purpose was protection of the Schuylkill River, the City's main supply of potable water at the time, from encroachment related to development and pollution. The park remains intact today as a resource for recreational users.

The Schuylkill River through the park is a major venue for rowing activities and competitions. Many rowing clubs are based in Boat House Row, a collection of boating club buildings along the east side of the River, just north of Fairmount Water Works. At the southern end of Boat House Row, a statue of Abraham Lincoln is located at the intersection of Kelly Drive, Sedgley Drive and Waterworks Drive.

In 2001, the Kelly/Sedgley/Waterworks Drives intersection was slightly realigned from what loosely resembled a traffic circle to a conventional four-legged intersection. The project was handled by the City of Philadelphia Department of Streets and its design consultant, Urban Engineers Inc. While this intersection work was in and of itself not very notable, what made it interesting was that the Lincoln statue had to be moved to permit the removal of the circle. The statue formerly sat in the center of the oval in the intersection. It was moved just over fifty feet to its new location in the southeastern quadrant of the intersection.

The statue itself has historic significance as the first known sculpture of Lincoln, created in 1871, six years after his assassination. The statue was presented to the City by a group which commissioned it. The City, in turn, considered several possible locations for it, but could not agree on one. A final decision was made to place the statue alongside East River Drive, where it remained for the next 130 years.

At the time, East River Drive was a little-used park drive. This changed radically with widespread use and ownership of automobiles in the 1910's and 1920's. As traffic increased, East River Drive was widened. At the Sedgley Drive intersection, northbound lanes of the widened drive could only be accommodated by an alignment of these lanes on the east side of the statue. The result was the creation of a small traffic circle at this intersection. Southbound lanes of East River Drive remained in the original alignment and therefore merely skirted the western edge of the statue's new oval.

This situation remained until the present day. As a parallel route to the often-crowded Schuylkill Expressway (I-76), Kelly Drive is now a busy commuter roadway, with about 25,000 ADT. At the Sedgley Drive intersection, most drivers probably swung around Lincoln on a daily basis without not knowing who the statue honored, as they were too busy watching the road and the busy traffic.

Activity in the park and at nearby Boathouse Row also increased. The boathouses, the center of the rowing activities of the Schuylkill Navy, local collegiate and high school crew teams, have little off-street and limited on-street parking which is inadequate for the user population. Most park on roads in the adjacent Lemon Hill section of the Park, which requires them to cross the busy Kelly Drive on foot with no traffic control to get to the boathouses. Park users must also cross the drive to get to park paths. A solution for this was desperately needed.

The first proposal for a solution was a pedestrian bridge. This would grade-separate the pedestrian crossing from the busy Kelly Drive motor traffic. Unfortunately, the bridge would be in the Park and its aesthetics were a serious consideration for visual impact. Additionally, the bridge only addressed one point of entry (Lemon Hill) and did not solve the problem of foot traffic from other areas. While the need for such a pedestrian crossing was very obvious, the solution was not.

A second possibility was suggested, namely the signalization of the Sedgley Drive intersection. The existing traffic circle was stop-controlled on the Sedgley Drive and Aquarium Drive approaches, but through traffic on Kelly Drive flowed freely, which did not offer a controlled pedestrian path across the busiest road in the intersection. This would require fairly extensive signal hardware to provide the requisite clearout phasing for motor traffic. The added overhead mast arm structures and poles were also felt to be too intrusive in the park setting, as they would detract from the aesthetics of the area.

An alternative was considered which would take all existing constraints into account. This would effectively both realign and signalize the intersection. Realignment would create a standard four-legged intersection and this would happen through the removal of the circle. Northbound Kelly Drive lanes would no longer need to traverse the reverse curve through the circle. Cross traffic from both Sedgley Drive and Aquarium Drive would be able to move more predictably and orderly with a signal. This was an important consideration, especially with new development in the Waterworks area along Aquarium Drive that would increase traffic on it (and, since Aquarium Drive was effectively a cul-de-sac, any ease of movement on the exit end would be advantageous). Pedestrians would be able to cross Kelly Drive with the protection of traffic signal control. However, removal of the circle would necessitate relocation of the statue from the center of the intersection to a possibly less prominent location at the side of the road. While this would be historically accurate, there would be a need to preserve existing sight lines to the statue in its new location.

This alternate was well received and signalization concepts began to be developed in 1992. Four basic options were presented, with the statue to be moved into (1) a new area on the northeast quadrant of the intersection, (2) a new island in the Sedgley Drive approach, and (3) and (4) in two separate locations in the southeast quadrant, in two slightly different orientations. The southeast quadrant, the historically accurate one (where the statue was before the road was realigned to surround it), got the nod. Approvals were required from the City's Fairmount Park Commission, Historical Commission, and Art Commission, and these were

"Lincoln" continued p. 22

"Lincoln" continued from p. 21

obtained as part of the design process. Since the project would be utilizing Federal Highway participation, environmental clearances were obtained through PennDOT.

The Department of Streets and Urban Engineers worked to finalize the West Park project, a major roadway restoration project primarily concentrated on West River Drive and Montgomery Drive in the portion of Fairmount Park on the west side of the Schuylkill River. The project was advertised for construction bids in August 1993, and work started in January 1994. General consensus was that the problems at the Lincoln Statue were finally solved and the solution would soon be implemented. Unfortunately, the work became embroiled in last-minute controversy with a local civic group. As a result, the City decided to extract the statue work from the contract in May 1994 and reconsider alternatives.

While the controversy stopped work, it did not stop the problems at the intersection. There was a heightened level of attention to the location and many clamored for solutions. There was some fear that a non-attractive basic signalization of the location might be the only option, and a forced one at that. The designers again consulted with both the City Historical Commission and State Historic and Museum Commission for direction to address the newly-raised concerns.

In the meantime, a second project was developed for roadway lighting modernization on Kelly Drive to replace an unreliable system. In 1998, a decision was made to resurrect the statue relocation/intersection realignment and implement it as an element of the lighting project. Plans were resurrected with slight modifications. Environmental and historic clearances were once again obtained, this time with no controversy. Statue work went to bid for a second time in February 2001. The second time proved to be the charm, as construction work finally began in May 2001.

From the beginning of the statue relocation design efforts, much of the work was based on assumptions, since no records of construction were available. Similarly, there was no non-invasive way to investigate statue construction extensively. New foundations and support pedestal for the statue were designed based on previous similar work. An art conservator was brought in to evaluate the relocation scheme during the design phase and make recommendations. It was determined that the work had so many unknowns that it would be best to have a conservator on site full-time to supervise the relocation.

The statue consists of the actual sculpture seated atop a granite pedestal. The pedestal is decorated with several bronze elements and plaques. The original approach to relocation was that the statue and pedestal would move as one unit, if it were determined to be feasible after more detailed examination of the piece. As final bid documents were being prepared, however, the staging of construction dictated that the new statue location would not be available until the new northbound roadway could be constructed. The new roadway could not be built until the statue was moved, since the statue's oval would be needed for the new alignment. Thus, it would be necessary for the artwork to be moved off-site, stored, and returned once grading and related work was completed at the new location. This introduced a new complication – transport of the statue and storage.

It was assumed that the pedestal was supported by a masonry structure inside the outer granite cladding, as was the case in many similar pieces. When the statue was removed, it was found that there was no support structure, and the granite cladding was actually a structure in itself. Additionally, there was no attachment hardware securing the statue to the pedestal, the statue was merely resting atop the granite blocks on a course of mortar. The granite blocks of the pedestal were also found to be resting on grade with no foundation. All pieces were wrapped and packed, then carefully lifted onto flatbed trucks and moved to the storage site, roughly five miles away, for further examination.

Remarkably, the pieces were found to be in good condition despite over 125 years of exposure to the elements. The conservator recommended that the disassembled granite be cleaned. Some minor cracks were noted in a few of the bronze elements but none were found to be serious or detrimental to the structure.

After careful examination of the sculpture, decisions were made to reattach the statue with a reversible method using bronze pins. This would allow the statue to be secured to the pedestal while also permitting its removal without any effect on the pedestal should the need arise. The pedestal had a number of iron anchor cramps holding several courses of granite together. These were found to be in remarkably good shape. All were replaced with stainless steel for continued longevity and function.

After the statue was removed, crews moved in to begin roadway construction. The initial thrust was to remove the circle and island which housed the statue. Once this was completed, traffic was shifted to the new northbound roadway and the new roadside area for the statue was graded and prepared. This grading was modified to some extent to raise the elevation of the statue.

The new traffic signal hardware was installed simultaneously with the roadway work. The signal was designed carefully and poles were located so as not to interfere with sight lines of the statue to the maximum possible extent.

The goal for completion of the intersection realignment was Labor Day 2001, and this goal was met. The statue, however, was not returned by that date. Several issues arose which needed resolution. One concerned the base of the statue. After evaluation, a decision was made to install a concrete base that would be covered by granite block in an oval shape replicating the previous oval in Kelly Drive. The granite curb from the oval was found to be in good condition, and was reused for the new statue plaza. Another consideration was the support structure within the granite pedestal. The original structure was redesigned slightly to account for the new statue base.

The statue was returned in early October 2001. As part of a related effort to illuminate statues along Kelly Drive, light poles and fixtures were placed in June 2003, and the statue in its new location can now been clearly viewed at night as well as in the daytime.

Construction cost for this work amounted to approximately $600,000. The general contractor for the project was Carr and Duff, Inc., with Tony DePaul and Son handling grading and paving aspects and George Young Inc. charged with movement of the statue and pedestal. ■

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- 62% are Engineering Consultants
- 10% are Contractors
- 10% are Related Professions
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Central Florida 258
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PROFESSIONAL STATUS	= 49%
DEPARTMENT OF TRANS	= 18%
CONSULTANT	= 62%
CONTRACTOR	= 10%
OTHER	= 10%