

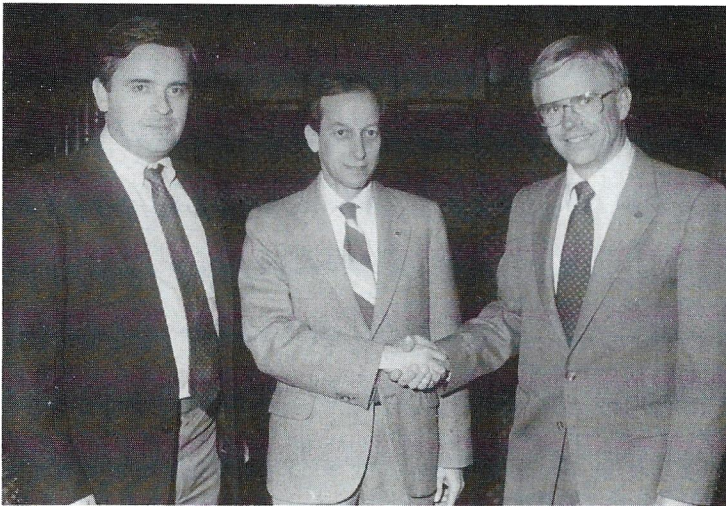
SCANNER

NEWSLETTER OF THE AMERICAN SOCIETY OF
HIGHWAY ENGINEERS



APRIL 1987

Yerusalim: New PennDOT Head



PennDOT's new Secretary, Howard Yerusalim, was the featured speaker at the February meeting of the Franklin Section. Pictured with Secretary Yerusalim are Franklin Section President Jack Baker (left) and District 1-0 Engineer Lewis Gurley (right).



PHIA President Ralph Peters (right) presents a shirt to PennDOT Secretary and ASHE-Harrisburg member Howard Yerusalim at a PHIA forum earlier this year.

In March, PennDOT Secretary and ASHE member Howard Yerusalim spoke to the more than 170 friends of PHIA at the first forum, the day following his unanimous Senate approval. He set the following priorities for his administration:

- * Spur economic development through the highway and transportation network.
- * Restore the existing system.
- * Ensure safety of Pennsylvania's roadways.
- * Build a team spirit among the PennDOT employees.
- * Develop a cooperative relationship with the Pennsylvania Turnpike Commission.

ASHE and Frankie PHIA (Pennsylvania Highway Information Association) have been together for more than 25 years. And with the Allentown convention this close, the working relationship

will be evident since PHIA will present one of the many educational exhibits on display.

Since economic development usually results from highway construction, PHIA this year will carry its program across the state emphasizing this point and providing forum opportunities.

PHIA Managing Director Bob Hetherington has stressed this subject at three ASHE meetings during 1987 at Pittsburgh, Harrisburg and Lamar.

The relationship of good highways to the economy has been recognized by the Pennsylvania Highway Information Association since 1982 through their "Good Highways are Everyone's Business" forums. These forms are held in all parts of Pennsylvania and have featured prominent speakers including Senator John Heinz, former Lieutenant Governor William Scranton, III, Congressman Bud

Shuster, and former PennDOT Secretary Tom Larson.

PHIA is a Harrisburg-based, non-lobbying statewide organization of more than 400 businesses and individuals working for better, safer Pennsylvania highways and bridges. PHIA's members come from the engineering and construction fields, the business community, labor, local government and many other areas.

The "Good Highways are Everyone's Business" forums also serve as a platform for PennDOT to outline highway and bridge projects in all areas of the Commonwealth to PHIA and guests.

If you'd like more details about PHIA's forums, ask Dave Hunt behind the PHIA booth at ASHE's National Convention in Allentown. Watch for details about the "Good Highways are Everyone's Business" forum in your area of the state!

25th National Convention May 14-17, 1987 — Allentown, PA

The Convention is almost upon us, so don't delay sending in your reservations. Hosted by the East Penn Section and held at the Allentown Hilton and Conference Center, it offers an outstanding mix of technical sessions and social time. Following is a detailed schedule.

Thursday, May 14, 1987

- 9:00 a.m. to 12:00 Noon
Exhibitors set up
- 12:00 Noon to 9:00 p.m.
Registration
- 1:00 p.m. to 9:00 p.m.
Convention Exhibits
(Calder Gallery and Ballroom D)
- 3:00 p.m. to 5:00 p.m.
Technical Sessions
(Rockwell Suite)
EXHIBITORS TECHNICAL
PRESENTATIONS
Dinner (on your own)
- * 7:00 p.m. to Midnight
Music and Dancing by
"The Good Times," D.J.'s

Friday, May 15, 1987

- 8:00 a.m. Breakfast
- 8:45 a.m. to 9:30 a.m.
Business Meeting
- 9:00 a.m. to 7:00 p.m.
Registration
- 9:00 a.m. to 5:00 p.m.
Convention Exhibits
(Calder Gallery and Ballroom D)
- 9:30 a.m. to 10:15 a.m.
Technical Session
(Rockwell Suite)
INTERSTATE 78 OVERVIEW
Neil J. Dekker, P.E.,
Liason Engineer
Pennsylvania Department of
Transportation; Allentown, PA
- 10:15 a.m. to 11:30 a.m.
Technical Session
(Rockwell Suite)
NOISE WALLS
John C. Galbraith, P.E., Partner
Yule, Jordan Associates;
Camp Hill, PA
TRAFFIC CONTROL &
OFF-SYSTEM IMPROVEMENTS
Dr. Robert B. Anderson, P.E.,
Engineering Manager
GAI Consultants, Inc.;
Monroeville, PA
- 10:15 a.m. to 11:30 a.m.
Technical Session (Opera Club)
DELAWARE RIVER BRIDGE
Dr. John M. Kulicki, P.E., Partner &
Russell W. Christie, P.E.,
Senior Associate;
Modjeski and Masters;
Mechanicsburg, PA
SOIL NAILING
James W. Sigourney, P.E., President
Earth Support Systems;
Leesburg, VA

Friday, May 15, 1987 (continued)

- 9:30 a.m. to 3:00 p.m.
Tour of Historic Bethlehem
- * 12:00 Noon to 1:30 p.m.
Annual Luncheon &
Keynote Speaker
(Ballrooms A & B)
Keynote Address:
"WHITHER THOU GOEST —
THE FUTURE OF OUR
NATIONAL HIGHWAY
PROGRAM"
Robert G. Bartlett, President
National Stone Association;
Washington, D.C.
- * 2:00 p.m. to 5:00 p.m.
Interstate 78 Field Trip
(Construction Sites)
- 2:00 p.m. to 5:00 p.m.
Technical Sessions
(Rockwell Suite)
SAUCON PARK VIADUCT
Dr. Arthur W. Hedgren, Jr., P.E.,
Technical Director for Steel
Bridges and Vice President
HDR-Richardson Gordon, Inc.;
Pittsburgh, PA
PAVEMENT DESIGN
John C. Miller, P.E.,
Plans Engineer
Pennsylvania Department of
Transportation; Allentown, PA
TIEBACK WALLS
Dennis L. Boley, P.E., Manager
of Research and Development
Nicholson Construction Co.;
Bridgeville, PA
LEHIGH PARKWAY BRIDGE
Piyush P. Amin, P.E.,
Assistant Vice President
and Manager
Michael Baker, Jr. Inc.;
Harrisburg, PA
SOILS — EMBANKMENT
CONSTRUCTION
Ronald M. Duffy, Soils Engineer
Pennsylvania Department of
Transportation; Allentown, PA
- 2:00 p.m. to 5:00 p.m.
Technical Sessions (Opera Club)
SINKHOLES
Michael Perlow, Jr., P.E.,
President
Valley Foundation Consultants, Inc.;
Allentown, PA
REPLACEMENT WETLANDS
Anne D. Marble, President
A. D. Marble & Company;
Wayne, PA

Friday, May 15, 1987 (continued)

- HIGHWAY RUNOFF
POLLUTANTS
William T. Guy, P.E.,
Senior Associate
Yule, Jordan Associates;
Camp Hills, PA
CORPS OF ENGINEERS
PERMIT
Richard Hassel;
U.S. Department of the Army
Corps of Engineers;
Philadelphia, PA
SCHANTZ SPRING
MIGIGATION MEASURES
Thomas A. Caramanico, P.E.,
Vice President
McCormick, Taylor & Associates, Inc.;
Philadelphia, PA
- 6:00 p.m. to 7:00 p.m.
Cocktail Party
- * 7:00 p.m. to 9:00 p.m.
Banquet
- 9:00 p.m. to 1:00 a.m.
Entertainment
(Tony Santoro, Comedian),
Music and Dancing by
"Just Friends" Band

Saturday, May 16, 1987

- 8:00 a.m. Breakfast Buffet
- 8:45 a.m. to 9:30 a.m.
Business Meeting
- 9:00 a.m. to 10:00 a.m.
National & Section
Officers Meeting
- 9:00 a.m. to 5:00 p.m.
Registration
- 9:00 a.m. to 12:00 Noon
Convention Exhibits
(Calder Gallery and Ballroom D)
- 9:00 a.m. to 10:00 a.m.
Technical Session (Ballroom C)
DELAWARE RIVER BRIDGE —
FABRICATION AND ERECTION
Videotape;
High Steel Structures, Inc.;
Lancaster, PA
- 9:00 a.m. to 10:00 a.m.
National & Section
Officers Meeting
- 10:00 a.m. to 11:30 a.m.
Chinese Cooking Demonstration
- * 10:30 a.m. to 5:00 p.m.
Golf Tournament (Golfing
awards to be presented at either
cocktail hour or entertainment
intermission.)
- 12:00 Noon Lunch (on your own)
- 1:30 p.m. to 5:00 p.m.
Free Time (shopping, visiting
local points of interest)
- 6:30 p.m. to 7:30 p.m.
Cocktail Party
- * 7:30 p.m. to 9:30 p.m.
Banquet
- 9:30 p.m. to 12:30 a.m.
Entertainment, Music and
Dancing by "George Boylan" Band

Tunnel Bypass Will Complete West Virginia Turnpike Upgrading

When the massive 1.72-mile "open cut" replacing the Memorial Tunnel and Bender Bridge is opened to traffic late this summer, it will mark the completion of upgrading of the West Virginia Turnpike to four-lane Interstate standards.

Once considered "a miracle of engineering" when its 88 miles through the mountain wilderness between Charleston and Princeton were completed in only two years, the 33-year-old road provided only two lanes of traffic when it was officially designated as part of Interstate 77, also carrying Interstate 64 from Charleston to the state's eastern section of the superhighway beginning at Beckley.

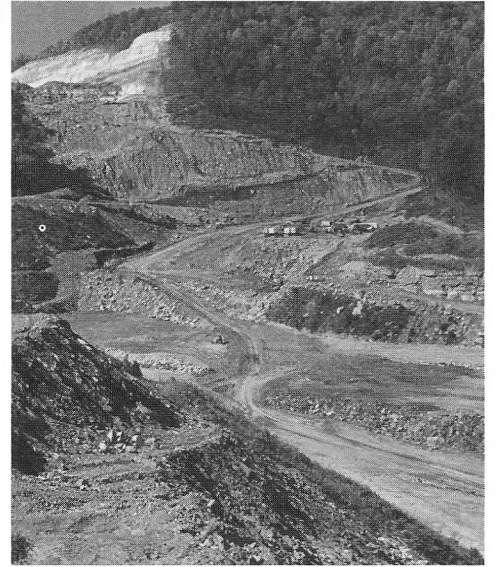
Construction to upgrade the road began late in 1976 and will end, 25 projects and nearly \$700 million later, with the opening of the giant cut-and-fill project that involves nearly one-fifth of all the earth that has ever been moved on the turnpike.

While the original cost to build the tunnel was \$5 million, Mashuda Corporation of Evans City, Pennsylvania bid \$35 million to construct its replacement, which covers the area from slightly north of the tunnel to slightly north of the Sharon interchange. Nearly 10 million cubic yards of rock and dirt will have been moved when the work is complete, carving out a 400-foot-deep cut in the mountain almost a quarter-mile across at its top followed by a 400-foot-deep fill of the valley of Fourmile Creek to replace the bridge named for a state Congressional Medal of Honor winner.

Rerouting the creek was the first step, accomplished by drilling a nearly 1900-foot tunnel through the mountain to carry the stream. Construction of a haul road of enormous dimensions was the next step. Requiring as much earthmoving as some normal-size Interstate projects, the 60-foot-wide road allowed dump trucks carrying 85-ton loads to pass each other—on a grade that began at a frightening 24 percent but is now nearly level.

With West Virginia's seemingly impenetrable terrain, closure of the tunnel would have meant a detour of nearly 70 miles for the road's heavy average daily traffic. For this reason, the extensive blasting necessary to change the mountain's profile was conducted with the utmost caution, particularly when it reached the point at which it was closest to the 2,265-foot tunnel which it parallels at an average of 350 feet to the side, on a plane about 60 feet higher.

Any distress in the tunnel, closed an average of twice a day for blasts that usually yielded 10,000 to 15,000 cubic yards of rock, was quickly registered on the barrage of equipment monitored by Department of Highways geologists. Extensometers measured the movement of the bedrock envelope of the tunnel liner, while convergence meters determined if the the sides of the tunnel were moving closer together or farther apart and seismographs measured the shock of the blasts, with all data fed into a computer.



EARLY IN PROJECT, haul road used by 85-ton dump trucks had a grade of over 20 percent. Now, with the majority of 10 million cubic yards of earthmoving completed, base for roadway construction has leveled out near midpoint of the nearly 900-foot mountain.

Earthwork is nearly complete, allowing contractors to look forward to "the easiest part," building the concrete roadway that will close the final gap between Cleveland, Ohio and Columbia, South Carolina.

Article: Courtesy of
Charleston Section

Photos by: David M. Bowen



BENDER BRIDGE and southern entrance to Memorial Tunnel at left are dwarfed by massive "open cut" nearing completion on the West Virginia Turnpike.



NEARLY A QUARTER-MILE wide at the top, the 400-foot-deep cut replacing the 33-year-old tunnel is followed by a 400-foot-deep fill replacing the Bender Bridge, named for a state Congressional Medal of Honor winner.

“Customized ENGINEERED FILLS Provide Specialized Alternate Solutions to Difficult Soils and Site Problems”

Many State Highway Departments and private consultants have utilized specialized ELASTIZELL EF to solve difficult site problems. These problems may include poor soils, excessive loads on existing structures, the ability to raise grade without adding a great deal of dead load, and providing a material which will completely fill voids and not require compaction.

These ENGINEERED FILL applications are value engineering alternatives to other “standard” solutions which include removal and replacement of poor soils, piling applications through the poor soil to an acceptable foundation, “bridging” an area of poor soil, surcharging these bad soils over periods of time, and strengthening structures to carry the excessive,

heavy dead loads of standard fill materials.

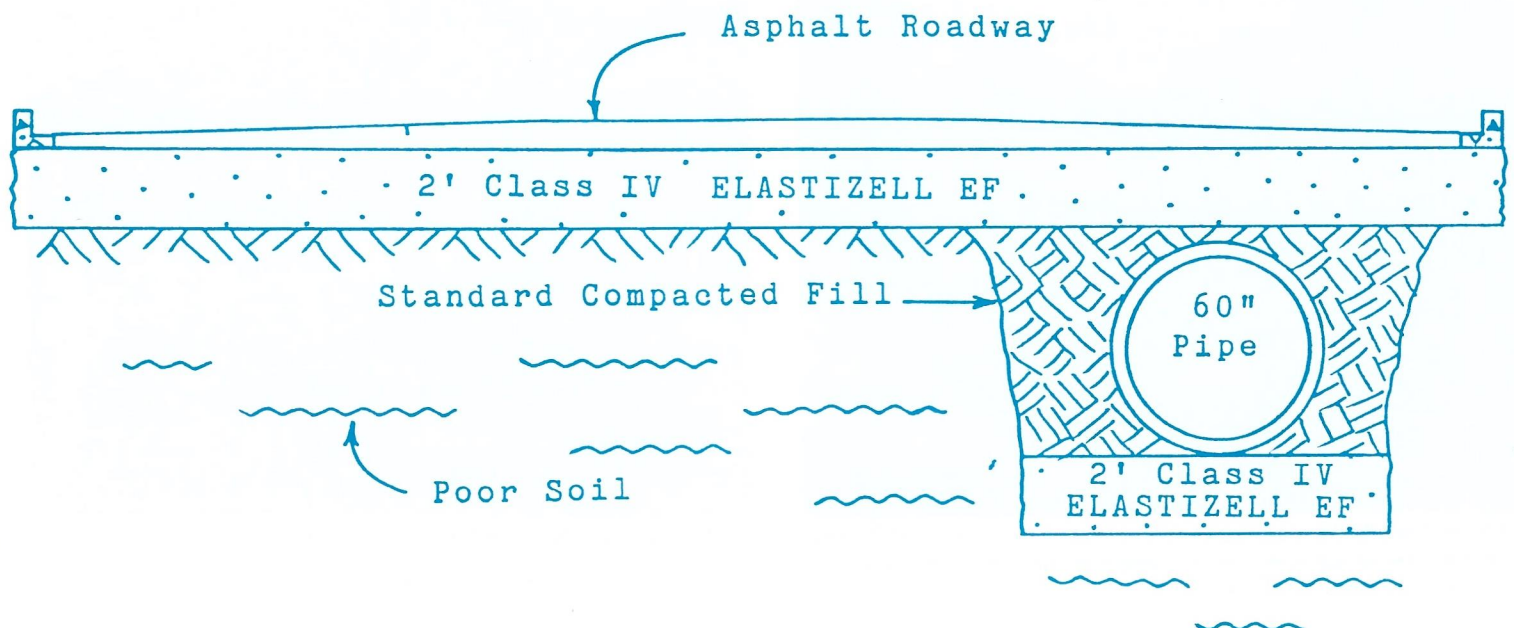
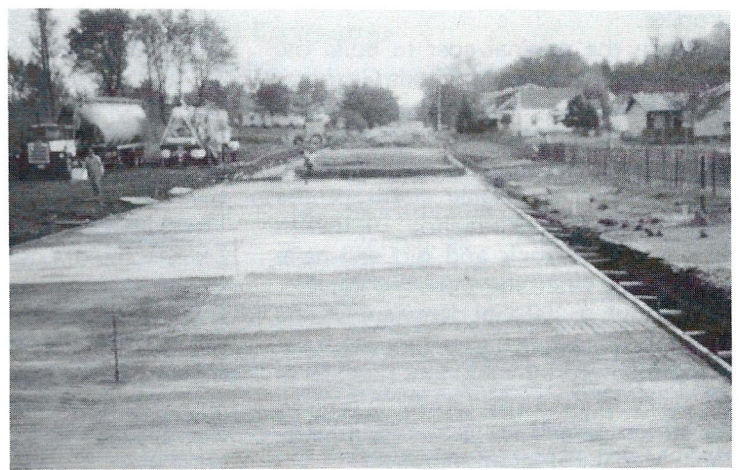
The major advantage of these ENGINEERED FILLS is their significantly lighter weight when compared to other fill materials. They have unique characteristics which result in innovative solutions to these engineering problems.

A roadway reconstruction project in Akron, Ohio illustrates the flexibility of this material. When a 60” sewer was being placed on the Gorge Blvd. reconstruction, it immediately began to sink under its own weight into the poor soils.

In this emergency situation, it was necessary to find a very lightweight fill material which would not overload the soil and distribute the pipe loads to the supporting soil. The solution was either

an ENGINEERED FILL or an expensive deep piling solution. Time was of the essence.

Utilizing specialized equipment, Place-Crete, Inc. of Dayton (a certified ELASTIZELL EF applicator) cast a 2’ thick pad of Class IV (36 pcf) ELASTIZELL EF in the excavated trench. The pipe was installed to the proper elevation on a 6” thick sand pad which was placed over the ELASTIZELL EF. Then, standard backfill material was compacted around the pipe. Finally, 2’ of Class IV ELASTIZELL EF was placed over the compacted fill and pipe to serve as a light-weight and solid base for the final roadway.



Technical Bulletin

Truck Escape Ramps

Gravel pile escape ramps, also referred to as runaway truck sandpiles or arrestor beds, provide a safe and successful means to stop a runaway truck. The Pennsylvania Department of Transportation currently is responsible for over 15 such ramps throughout the Commonwealth. These truck ramps have dramatically reduced property damage and more importantly have saved lives. Recent analysis of past ramp use indicates over a three dollar savings in property repairs for every dollar spent in ramp construction and maintenance.

Although these ramps safely stop out-of-control trucks, the design standards are overly conservative and construction procedures indicate a need for increased efficiency. Improved ramp designs could significantly reduce construction costs and still maintain or enhance safety features.

To investigate the potential for construction savings, the Department funded a preliminary research study of truck escape designs. This study identified alternative methods to the escape ramp but concluded that what Pennsylvania now maintains is by far the most effective means for stopping runaway trucks. The report ranked the gravel-type bed as the most effective type of ramp, followed by the sandpile and gravity ramps. The study recommended further investigation into areas such as the relationship between drag force and vehicle speed, contact pressure or tire size; minimum and maximum bed slopes; bed drainage; and tire performance.

Based upon this recommendation, the Department initiated a second

research project which is currently being performed at the Pennsylvania State University Truck Escape Ramp Facility. Field testing is also being conducted at various ramps across Pennsylvania.

Anticipated results of the current study include new design procedures, guidelines for aggregate selection, winter maintenance procedures, and an improved system for removing trucks from the gravel beds. Although it is too early in the study to accurately estimate benefits, preliminary findings suggest potential savings of 40%-50% over present construction costs. The Department intends to construct at least four more beds in the near future. Therefore, with construction costs ranging from \$100,000 to \$1,000,000 per bed and averaging \$350,000 each, the potential savings will be significant.

This project is sponsored by PA DOT and the Federal Highway Administration. The estimated completion date is June 1986.

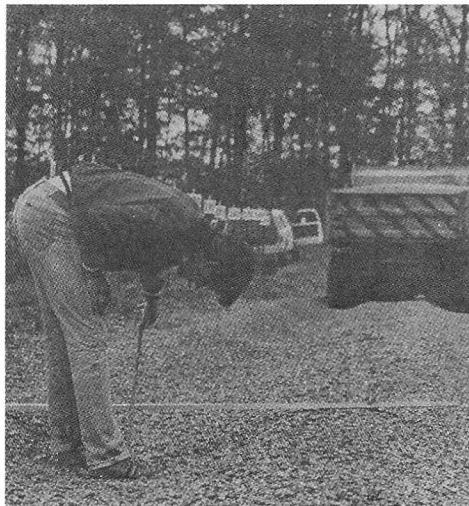
Further information on this or any other Innovation Through Research and Technology Summary may be obtained by contacting the PA Department of Transportation, Office of Research and Special Studies, Technical Reference Center, Room 903 Transportation and Safety Building, Harrisburg, PA 17120, telephone number 717/787-6527.

Reference #83-04 — Preliminary Study of Truck Escape Ramp Design Methodologies

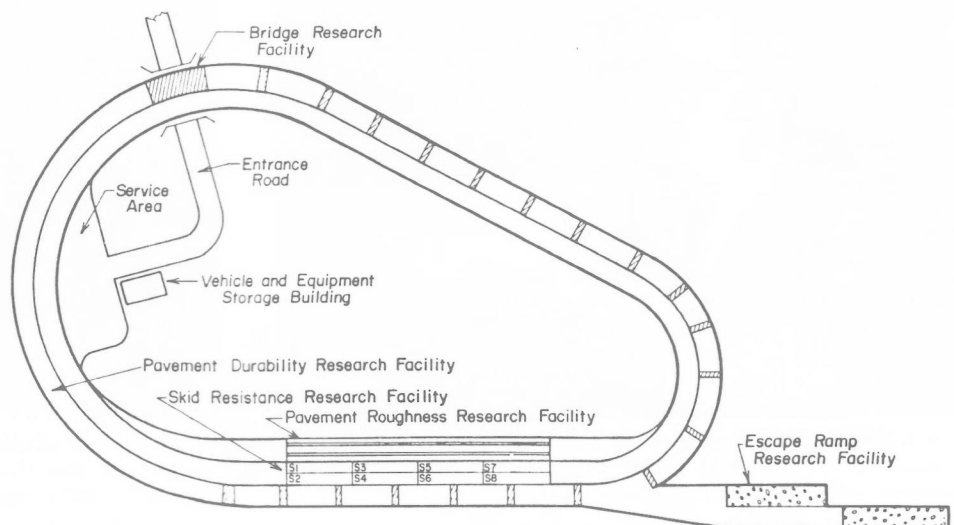
#83-26 — A Field and Laboratory Study to Establish Truck Escape Ramp Design Methodologies



Test at Puxsutawney Escape Ramp Site.



Measuring Ruts Left by the Escape Ramp Test Truck.



Harrisburg Section News

Four dinner meetings and an annual Engineers Week Program highlighted the Winter season of the Harrisburg Section.

Thanks to many new members, guests, and cooperating weather, all programs held locally were well attended by upwards of 80 individuals.

The December dinner meeting featured an illustrated talk by Phil Malachowski of High Steel Structures on the planning and design of the Lewisburg River Bridge. The speech detailed behind-the-scenes thinking and planning for this multi-million dollar structure, the first major bridge turnkey project in Pennsylvania.

The first ASHE program of the New Year focused upon the History and Challenges of Interstate 476. A long discussed and much litigated 20 mile section of highway in the Philadelphia area, Mr. Jack Smyth of the Delta Group detailed state-of-the-art design, environmental, and

impact reduction strategies incorporated into the recent design of the \$400 million highway. Construction of the I-476 facility is expected to begin in the Summer of this year.

The February meeting featured an informative overview by Mr. M. G. Patel of PennDOT of advanced bridge design techniques and new methodologies now being incorporated into the Department's Design Manuals. Mr. Patel is coordinating the complete rewriting of the PennDOT Bridge Design Manual, a task which involves upwards of seven consultants and considerable in-house staff. Publication of the new manuals is expected by the end of 1987.

In February, ASHE was one of ten local engineering societies which sponsored the annual Central Pennsylvania Engineers Week Dinner. The event, held at the New Cumberland Army Depot, featured an illustrated talk by Mr. Denis

duBreuil of the U. S. Army Corps of Engineers. The speaker discussed the \$175 million Eastern Distribution Facility to be constructed on a 30 acre site at the New Cumberland facility. During the dinner, Mr. Felix Kitlinski of Harrisburg was presented the Engineer of the Year Award for 1987. Mr. Kitlinski works in the area of soil mechanics, foundations, and geotechnical engineering, and is President of his own firm.

The final Winter program of 1987 featured a talk by Mr. Bob Heatherington of the Pennsylvania Highway Information Association. On March 2nd, Mr. Heatherington addressed the topic of ongoing section involvement in highway affairs at both the state and national levels. The speaker conveyed optimism regarding the current and future highway program in Pennsylvania.



Mr. Phil Malachowski, Senior Design Engineer for High Steel Structures, discusses design and construction of the Lewisburg River Bridge during a December meeting of the Harrisburg ASHE Section.



Bob Heatherington, Managing Director of the Pennsylvania Highway Information Association, addresses a Harrisburg ASHE meeting March 2, 1987.



Mr. Jack Smyth, Vice President of The Delta Group and Design Coordinator for PennDOT's I-476 project, addresses the design challenges of the "Blue Route" during a January talk in Harrisburg.



State Transportation Secretary Howard Yerusalam, a longtime member of the Harrisburg ASHE Section, was on hand at the March 2, 1987 dinner and received Section plaudits. Yerusalam was recently selected by Governor Casey to head PennDOT.

The GHOST Run

On October 11, 1986, over 120 runners opened Pennsylvania's first section of the Southern Tier Expressway. The GHOST Run (Grand Highway Opening of the Southern Tier), Pennsylvania's first foot race held to commemorate the opening of a highway, was sponsored by the Franklin Section of ASHE.

The new two-lane highway in Erie County, also called Route 17, was completed in two sections over two years at a cost of \$22 million. The third and final section of the road, planned for completion in 1988, will link Pennsylvania's portion of the expressway to New York State's Southern Tier.

Pennsylvania Department of Transportation District Engineer and ASHE Vice-President (Franklin Section), Lewis Gurley, was among those who ran in the five mile out and back run.

"The special opening of the new highway represented the continued progress of the transportation system in northwestern Pennsylvania over the past several years," Gurley said. "Residents of Pennsylvania and New York are moving closer to having convenient interstate access to major metropolitan and recreational areas in both states."

The race was successful and many of the participants are awaiting a proposed follow-up race to open the final section some time next year.

A registration fee was collected by ASHE, which entitled entrants to a commemorative T-shirt. Awards were given to the top three men and women finishers in six age groups. Refreshments, donated in part by local merchants, were on hand following the race.

The following industry related organizations showed their support for the race and we are grateful to them: Allegheny Automobile Association, Cross and Company, Foster Grading Company, Hasbrouck Sand and Gravel Company, Highway Construction Products, Inc., IA Construction Company, Joseph McCormick Construction Company, Lane Construction Corporation, McCormick Materials, Salvucci and Associates, and Schneider Construction Company. "As a result of the GHOST Run, over \$400 was donated to the Franklin Section's Scholarship Fund," Gurley said.

The 3.5 mile link between Interstate 90 and Route 89 near North East was completed by Lane Construction Corporation of Meridan, Connecticut, and Cold Springs Construction of Akron, New York.

Letter to The Editor

As directed by the membership of the East Penn Section, at our regularly scheduled meeting on October 14, 1986, I have been instructed to forward to you our feelings on the new direction taken by the Scanner so far as the coverage of social events and functions.

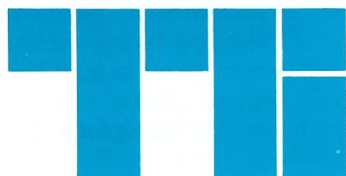
The general feeling, of this section, is that social events should be covered within the Scanner as it informs the various Sections of activities outside of their area.

We support the Scanner's new direction of including more technical articles, but also wish the Scanner to continue including some social event coverage. A balanced coverage of articles such as 50% technical and 50% social would be most desirable.

Finally, it was felt that Convention coverage should be included in the next Scanner published after the Convention as it was with the 1986 Convention coverage.

We extend to you and your staff a well done and look forward to future Scanner coverage of both technical articles and social events.

Dennis G. Engelmann P.E.
Secretary, East Penn Section



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Jay Hammerschmitt

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Akron Stops Bridge Deterioration With Cathodic Protection

Nearly twenty years ago, highway and bridge engineers recognized corrosion of reinforcing steel as a major contributor to the deterioration of concrete bridges. The City of Akron, Ohio, like most municipalities, was concerned with finding a solution to this serious problem.

In 1979, Akron installed a "cathodic protection" system on a bridge deck to stop the corrosion on the steel reinforcement. Cathodic protection of steel in concrete was a very new idea. Few systems had been installed at this time.

To understand cathodic protection, the corrosion mechanism must be understood. Corrosion is an electrolytic process by which all refined metals return to their natural state. All metals have an inherent electrical potential, as illustrated in chemistry books as the electromotive series. The corrosion cell can most easily be described as a battery. (Diagram A) the corroding metal (anode) discharges current through a conductive medium (electrolyte) to a non-corroding metal (cathode). Finally, the anode and cathode are connected by a conductive path. These four elements of a corrosion cell are all present in reinforced concrete: anodic and cathodic areas on the rebar; moist, chloride contaminated concrete serves as the electrolyte; and the rebar mat is the conductive path which completes the circuit. (Diagram B) When a metal corrodes, the buildup of ferrous oxides, or rust, occupy a greater volume than the original piece of corroding steel. This creates internal pressure in the concrete and delaminations and spalls occur. (Diagram C)

Cathodic protection works by simply altering the natural corrosion cell. A long life, low resistance anode material is introduced into the corrosive environment. A rectifier (powered by AC) provides DC power to the anodes. The anodes discharge more current than the natural galvanic current of the steel, therefore reversing the current flow. This renders the entire steel mat cathodic, or non-corroding.

Akron's first cathodic protection system consisted of disk-like anodes that were affixed to the deck. Then a conductive overlay was placed. On top of that was placed an asphalt overlay wear surface. The system was, and still is, providing corrosion control of the steel. However, the disadvantages of the system were the increased thickness and deadload. In 1982, Akron used cathodic protection again. This time the anode material was placed in slots cut into the deck. This eliminated the need for the additional overlay. This past construction season, two more bridges received cathodic protection. This application utilized the platinum wire, carbon filament, and conductive polymer concrete. The anode materials were placed directly onto a scarified deck surface. A latex modified concrete was used as the overlay. (Diagram D) Next spring, three more decks will receive cathodic protection with up to five more being proposed.

New anode materials are being developed. Today, there are mesh anodes that can be rolled out onto a scarified deck and overlaid with a wear surface. Also, sprayable paints and mastics are being used for application of the underside of decks and for substructures.

In 1982, three years after the City of Akron had installed their first system, the Federal Highway Administration issued an internal memorandum stating "The only rehabilitation technique that has proven to stop corrosion in salt contaminated bridge decks regardless of chloride content of the concrete, is cathodic protection."

If you would like more technical information on corrosion and cathodic protection, contact Harco Corporation, 1090 Enterprise Drive, Medina, Ohio 44256, phone number 216/725-6681.

DECK SPALLING FROM CORROSION

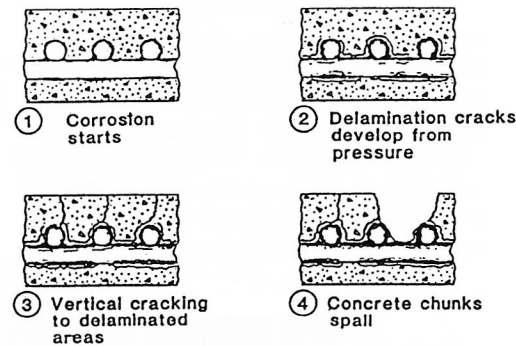


Diagram C

A CORROSION CELL IS A BATTERY

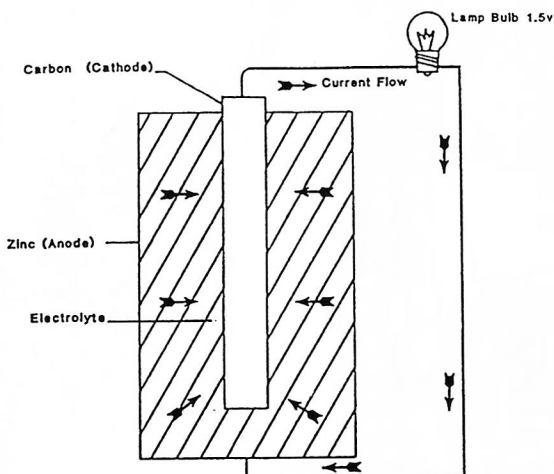
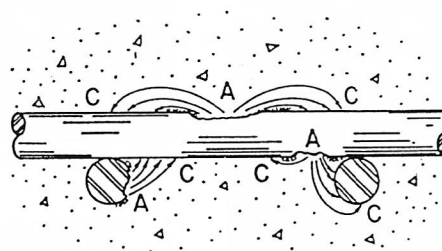


Diagram A



Anode (A) = Corroding Areas
Cathode (C) = Non-Corroding Areas

Diagram B

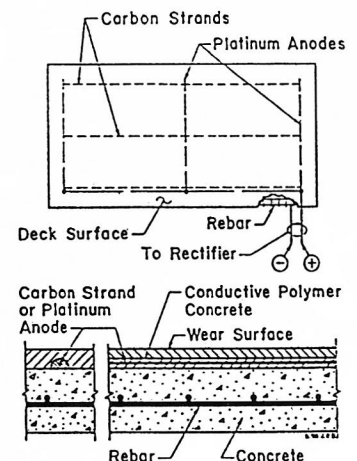


Diagram D

ASHE National Director Receives Distinguished Engineer of the Year Award



Harry Bisco, P.E.

Harry Bisco, P.E., City Engineer and Public Works Director for the City of Allentown, has been chosen "**Engineer of the Year**" by his peers in the Lehigh Valley Chapter of the Pennsylvania Society of Professional Engineers.

In addition to recognizing his engineering achievements, he was chosen for contribution to engineering literature, participation in professional organizations and involvement in community organizations and projects.

Mr. Bisco has been employed by the City of Allentown for the past twelve years, and is responsible for Allentown's Waste Water Collection and Disposal Plan System, its Water Supply and Filtration Plant, Bridges, Streets, Engineering Bureau, Solid Waste Collection and Disposal, and Municipal Equipment Maintenance Garage.

Since coming to Allentown, Mr. Bisco has been a pioneer in the introduction of an innovative Pavement Management System, and has constructed one of the first of its kind Odor Control Systems used at the Waste Water Treatment Plant. With new raw water intake on the

Lehigh River, he made the City's water supply secure by providing an alternate source.

His installation of a permanent pavement de-icer, imported from Europe five years ago, was the first of its kind in Pennsylvania, and one of the most successful installations on this Continent. These five (5) installations prevent snow, ice or sleet from binding to the pavement of the streets and bridges, allowing safe traction for vehicles. This process should become a very important safety aid for motorists in snow areas.

Active in many organizations, he is a National Director for the American Public Works Association and the American Society of Highway Engineers. He has been honored as Central Pennsylvania Chapter Man of the Year on two occasions for community work and developing the Professional Engineer.

4-Years Experience with Cold Recycled Bituminous Material

District 1-0 of the Pennsylvania Department of Transportation, which includes six counties in northwest PA, has been cold recycling bituminous pavements now for four years with very successful results.

The original reasons for performing cold recycling projects was for the conservation of asphalt and aggregate materials and to recondition low-volume roads more economically.

Subsequent benefits were also discovered and will be the emphasis of this report. District 1-0, in its northern PA climate has been experiencing quite a bit of reflective and thermal cracking of new bituminous overlays, often as early as six months after placement.

We have discovered that by cold recycling an older brittle pavement approximately 2" to 3" in depth and then overlaying this with virgin hot mix material that the cold recycled material acts as an interlayer and retards reflective cracking.

Examples of these projects are Gore Road in Erie County between T.R.'s 97 and 8; placed in 1983 that involved 2½" of cold recycled material mixed with E-5 emulsion (2.6%) and then overlayed with 2" binder and 1½" ID-2 top. Practically no

cracking was evident on this 2½ mile roadway section after three years with a daily volume of traffic of 4000 with 10% trucks.

Another example is T.R. 208 between I-79 and T.R. 19 in Mercer County. This construction section was approximately five miles in length, involved an ADT of 3500 with 9% trucks and the original pavement was extremely heavy laden with alligator cracking and surface deterioration. This project involved 3" of cold recycling, some leveling tonnage, 2" binder and 1½" ID-2 top. The cold recycle operation consisted of a miller, crusher, drum mixer and paver all in one paving train. In this case a 2.5% E-8 emulsion was added along with 4% water (to improve coating of all aggregates). Rolling was performed using rubber tired and vibratory rollers.

Two more projects were constructed in 1986 with cold recycled material used as an interlayer. One on T.R. 6N in Erie County, between Edinboro and Albion with an ADT of 2000 with 12% trucks. The other projects was on T.R. 97 in Erie County, north of Waterford, with an ADT of 3400 and 11% trucks. In the case of these two projects, 4" of cold recycled depth with 1½" ID-2 surface over the RAP material with approximately 3.5% E-8

emulsion was utilized as the bonding agent. These two projects are too recent to determine if there will be any long-range effects of wheel rutting, etc. as the previously mentioned projects did have a binder course.

In summary, the service of the above projects has been excellent to date with practically no preventative maintenance or crack sealing needed on these projects.

The District has also placed numerous other cold recycle projects with success but the projects mentioned above are the most significant with respect to crack retardation on medium volume routes.

The District plans to construct another similar type project in Crawford County, probably in June or July of this year.

If any of our readers are interested in more information on the above projects or procedures used, please contact our Franklin Section Technical Committee representative, Mr. William R. Jones, P.E., at 814-437-4374.

By: **William R. Jones, P.E.**
Technical Committee
Franklin Section

Delaware Valley News

The Delaware Valley Section recently participated in the "Engineering and Technology Conference and Construction Expo '87," which was held at the Valley Forge Convention Center from February 26 through February 28. The annual event is coordinated by the Engineers' Club of Philadelphia, with assistance from other engineering societies in the region, including the Delaware Valley Section of ASHE.

Over two dozen seminars were presented at the conference. These covered a wide range of subjects pertinent to the construction industry, as well as many state of the art, "high-tech" topics.

The exhibition floor was filled with 250 presentations of products and services. The demonstrations and literature made

available provided a wealth of information for the more than 5000 people that attended the conference.

The Delaware Valley Section booth distributed information concerning the Society to hundreds of participants. The ASHE display boards, on loan from National, provided an excellent back-

drop, and gave ASHE a very impressive showing in comparison with the other attending engineering societies.

Participation in the conference was a great success in promoting ASHE with others in the construction and technology fields.

By: **Dan Flint**

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U.S. Route 220 Demonstration Project

by

Craig L. Weaver, P.E., Altoona Section Technical Committee

Albert Bedard, P.E., Erdman Anthony Assoc.

William J. Wilson, P.E., PennDOT District 9-0

A portion of U.S. 220 (Legislative Route 1061) in southern Blair County is being constructed as a Demonstration Project by the Pennsylvania Department of Transportation. The ten mile four lane, limited access highway exhibits State of the Art (SOTA) technology. The SOTA effort was designed by Erdman Anthony Associates of Harrisburg, PA under accelerated highway development procedures, known as Facilitate Acceleration through Special Techniques (FAST).

The demonstration project was funded through the Surface Transportation Assistance Act of 1982. The act established funding to demonstrate the latest high-type geometric design features and new advances in highway traffic control and safety hardware. All design elements were designed to provide the best life-cycle costs.

The SOTA items identified for use on the project include the following:

- Prestressed concrete pavement with special prestressed joints to reduce the number of pavement joints
- Snowplowable recessed pavement markers
- Flexible delineator reflector posts
- Modified three beam guiderail to eliminate vaulting
- Energy absorbing guiderail and treatments

- Low profile safety coupler sign posts
- Debris Rack
- Smooth speed transition geometric design
- Improved decision sight distance
- Simultaneous horizontal and vertical curves
- Superelevation with curved sections
- Telac traffic monitoring system
- Viewshed articulation
- Daylight design treatment
- Buffer and transition zones
- Integrated earthwork
- Collaborative project development
- Internal energy dissipators
- Brush piles and barriers
- Polyethylene corrugated pipe
- Engineering fabrics (nylon erosion control mat)
- Slotted drain pipe in median area to remove accumulated snow melt
- Retention pond (impervious liner & outlet structures)

Bridge

- Cast-in-place lightweight concrete bridge decks
- Prestressed precast, concrete planks or lightweight

- Design for continuity of live loads
- Proprietary abutments and walls
- Spread footings using modern soils techniques
- Precast concrete box culverts
- Blended structural design
- Flexible integral supports
- Precast lightweight concrete parapet
- Superstructure drainage - Type C Gutter Inlet, Special

Twenty-one items will be monitored to determine the effects of using the best available technology on safety and other considerations. Reports to Congress will include recommendations for applying the results to other highway projects as well as any changes in the law that may be necessary to permit further use of such features.

Travelers on U.S. Route 220 will notice more visible aesthetic and landscape elements complementary to the project. Route location, roadside treatments, natural topography, viewsheds and visual perceptions such as color, texture, form, scale setting and context were regarded as important broad level design controls.

Anticipated to be completed in Fall 1988 at a total construction cost of \$75,000,000, the highway is evidence of the highway engineer's ability to complement nature.

Good Government Is Everybody's Business

Good government is the responsibility of the People! By joining the Construction Legislative Council, the Pittsburgh Section of ASHE has taken a positive step in assuring that good government can be instituted. Our experience and expertise must be communicated to those elected officials whose responsibility it is to institute the laws governing our industry. The Council is a multi-discipline coalition of Construction Associations and Professional Societies. The Council serves the legislative concerns of Construction Contractors, Architects, Engineers and Material Suppliers from Western Pennsylvania who are engaged in commercial, industrial, institutional, heavy/highway and utility construction.

There are four main objectives:

1. To improve government through purposeful involvement.
2. To establish a forum for the interchange of views and positions on issues affecting the construction industry.
3. To encourage individuals and associations to actively participate in Legislative activities.

4. To monitor and report on Legislation of concern to the construction industry.

The Council carries out these objectives by taking an active part in the Legislative process. Typical activities of the Council include:

1. Conduct monthly business meetings September through May and provide luncheon speakers on pending Legislation at the Local, State and/or National level.
2. Recognize and support candidates with construction industry interests.
3. Circulate position statements and hearing testimony.
4. Adopt resolutions and write letters voicing the industry's support on an issue or Bill within the Legislative process.
5. Maintain and develop Legislative contacts with Legislators.
6. Conduct Legislative surveys and questionnaires on key issues.
7. Provide an Annual Legislative Banquet with local Legislators as guests of the Council. This provides for personal contact on a one to one basis.

8. Attendance by Council members to the National Legislative Conference held each year in Washington, D.C.
9. Provide flyers, brochures and other related material for member organizations.
10. Involvement by each member organization by having two delegates and two alternate delegates elected each year for council participation.

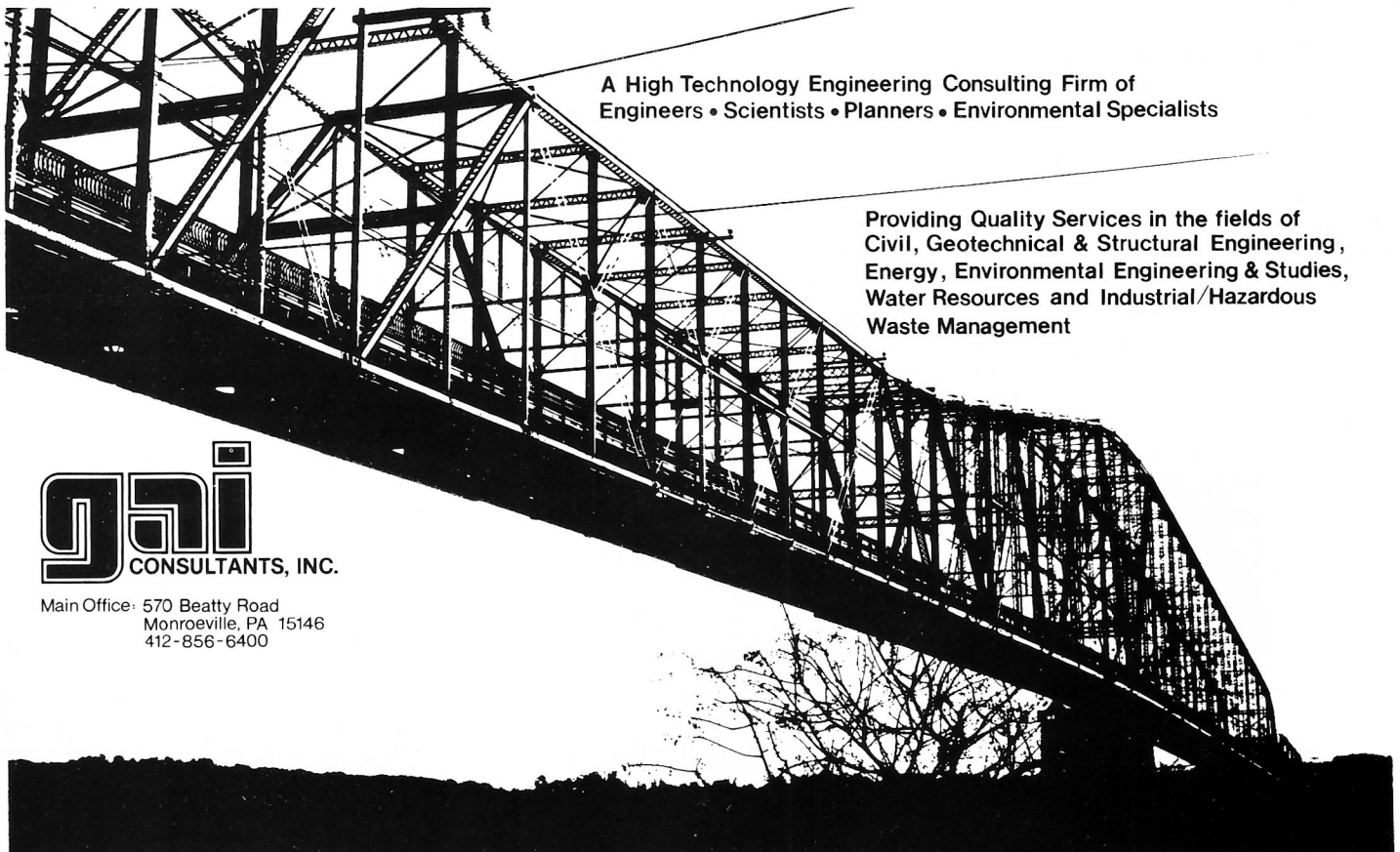
The Pittsburgh Section of ASHE is proud to play a part in this result-oriented group striving to keep the construction industry abreast on current issues and in presenting a unified voice. "We the people . . ." must speak out!

By: **Larry E. Young**
Public Relations Chairman
Pittsburgh Section

Announcement:

DePaul Concrete Company wishes to announce the opening of the second of two DePaul Concrete Co. Central-Mix Plants. The newest plant is:

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Secretary's Corner

The National Convention at Allentown is rapidly approaching which signals the end of another ASHE fiscal year. We are pleased that a new section in Delaware (First State Section) is forming.

With the beginning of the new fiscal year comes the routine book work I must remind you of:

1. Dues invoices for 1987/88 will be mailed about May 1, 1987.

2. Section officers rosters are due to me **no later than** June 15, 1987.

3. Section financial statements for 1986/87 are due to me **no later than** July 1, 1987.

The IRS requires the officers roster and financial statement, so please be prompt with your submission.

Respectfully submitted

Terry Conner
 Natl. Secy.

Pearson Joins ACI Editorial Staff

Robert I. Pearson, a civil engineer and urban planner, has joined the American Concrete Institute as Engineer Editor of the monthly magazine **Concrete International: Design & Construction**.

Pearson's responsibilities as engineering editor will include reviewing and editing technical articles submitted for publication, as well as researching and writing on concrete-related topics. **Concrete International** is one of the Institute's vehicles for providing timely and useful information on recent developments in concrete design and construction.

Pearson studied civil engineering at the University of Sydney, Australia, and received a BE in civil engineering in 1970. During his years as an undergraduate he was employed by the Department of Main Roads, N.S.W. (Australia) as a trainee engineer, and after graduation continued working for the DMR in highway construction and design. In 1976 Pearson immigrated to the U.S.A. and joined Anderson Sales and Service in Bloomfield Hills, Michigan, as a manager. He recently received a Master of Urban Planning degree from Wayne State University, Detroit, Michigan.

The American Concrete Institute is an international, nonprofit society organized to provide research and information to improve the design, construction, use, and maintenance of concrete structures.

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