

ASH AT WORK

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1972

Bottom Ashes In Major Road Construction

1/4 Million Tons Used

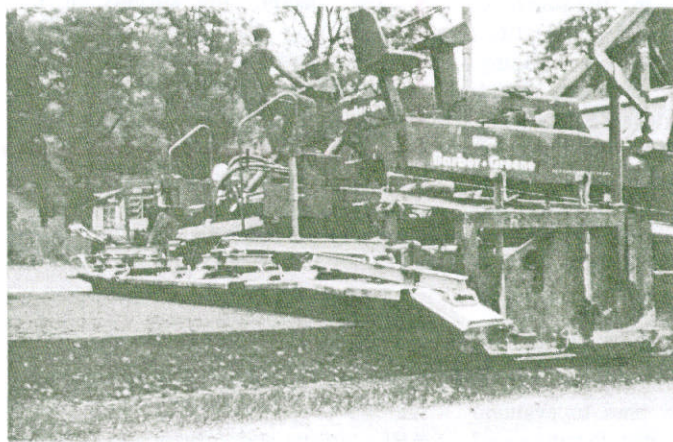
In West Virginia Route 2

A major road construction project currently underway in the upper Ohio Basin in West Virginia's Northern Panhandle will utilize approximately 1/4 million tons of bottom ash and boiler slag from nearby power plants in both Ohio and West Virginia plus blast furnace slag from Pennsylvania in the widening and relocation of a portion of that state's Route 2. This job is one of the few in the country constructed almost entirely of by-product materials. No natural aggregates were used.

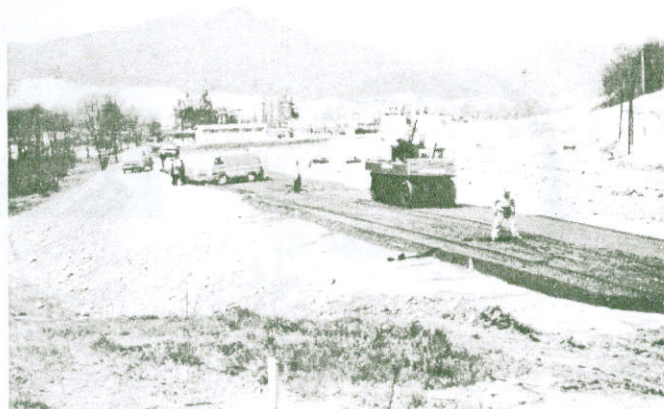
The bottom, cement-treated base course in the 4-mile long project is now being constructed and consists of 45% cyclone slag from the nearby Kammer Plant (Ohio Power Co.) and 42% dry bottom boiler ash from Appalachian Power's new Mitchell Plant. These two materials are mixed with 5% Type I Portland cement and 8% water to form the final mix. The cement-treated material is placed in one lift and compacted to a final thickness of 6". Density measurements have met or exceeded the state requirement of 97% of Proctor.

The overlying course, an aggregate base course, is placed in two lifts to a final thickness of 9". The mix is composed of 80-85% bottom ash and 15-20% AASHO #3 blast furnace slag.

The surface course, a bituminous concrete, is 2" thick and contains both boiler slag and blast furnace slag as aggregate.



All courses in the road construction project contain ash to fulfill several functions.



The Route 2 project demonstrates the versatility of bottom ashes when quality control and performance engineering are emphasized.

50,000 tons of boiler slag from Ohio Power's Cardinal Plant, 40 miles up-river at Brilliant, Ohio, will be used to produce the shoulders and base for lightweight "feeder" or access roads. Preliminary tests show the material will compact to 98-99% of Proctor density, well exceeding the state's 95% requirement. The shoulders will be covered with consecutive layers of AASHO #3, #7, and #8 blast furnace slags, with oil treatment between aggregate layers.

Ash is effectively being used in a number of areas in the country to conserve dwindling aggregate resources. State inspectors have expressed their pleasure in the quality of this job and the performance of the material. The Route 2 project is expected to result in considerable savings to the state as well as produce a good road.

Credits:

General Contractor S. J. Groves & Sons, Inc.
Paving Contractor Tri-State Asphalt, Inc.
Ash Supplier Highway Materials, Inc.
Ash Sources Appalachian Power Company
Ohio Power Company

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Personal Profiles — Allegheny Power Ash Representatives

The Allegheny Power System, Inc., has begun a program designed to take advantage of the potential use of fly ash and bottom ashes.

Allan W. Babcock and Bernard G. Hawkins have been assigned the responsibility for the promotion of ash sales throughout the utility's service area.

Babcock, who is located in Fairmont, West Virginia, will handle the output from APS stations located in the Monongahela Power Company and The Potomac Edison Company service areas, and Haw-



Al Babcock

Ash-Based Aggregate In Roadbuilding

Highway officials in West Virginia recently heard presentations by several experts on the value of using synthetic aggregate in roadbuilding. Dr. L. John Minnick, G. & W. H. Corson, Inc., explained the process developed by the Corson Co. which uses fly ash, sulfate sludges and lime as ingredients in a quality roadbuilding aggregate.

The success of the material at TRANSPOT '72, coupled with previous extensive research and testing by Corson researchers, has prompted the Federal Highway Administration (FHWA) to encourage expanded use of the fly ash-sludge-lime mixture on regular highway projects. This encouragement by FHWA is a part of the broad-based goal of demonstrating the use of several specified waste products.

kins will direct sales from West Penn Power Company headquarters in Greensburg, Pennsylvania.

Bernie Hawkins has been meeting with Pa. state highway officials and reclamation officers to promote the use of ash materials in roadbuilding and land reclamation. Preliminary work is underway on three landfill and subsidence projects.



Bernie Hawkins

Since taking his new responsibility, Al Babcock has worked with federal, state and local officials, and diverse private industry people—all of whom play a potentially important role in reaching the Allegheny Power System's goal.

Babcock and Hawkins are establishing and promoting uses for ash that will be of benefit to all concerned—citizens, industry and utility—in the APS service area.

The importance of such demonstrations and ultimate utilization is magnified in view of such real problems as mounting pollution in some areas and the shortages of natural materials for such applications as, in this case, aggregate in roadbuilding. At the West Virginia Highway Dept. meeting, Dr. David Maneval, Science Advisor, Appalachian Regional Commission (ARC), emphasized that southern West Virginia is, indeed, aggregate-short at this time. To further clarify the specific needs for using such materials, the ARC is sponsoring a consultant evaluation of the factors relating to the process.

After hearing the presentations and discussions, West Virginia highway representatives decided on a plan to evaluate the technical and economic feasibility of the fly ash-sludge-lime aggregate in local service roads and repair jobs within the state highway system.

Based on the findings of the ARC-

IN MEMORIAL

Paul G. Viall — Paul passed away Friday, August 25, 1972 of a heart attack. He had been confined in the hospital for several weeks. The fly ash community has lost a diligent ash promoter, family man and friend.

Mr. Viall founded Viall-Ohio Fly Ash Company Incorporated a number of years ago in the Akron area. Through his efforts, the company has expanded operations, working with several utilities on ash disposal and utilization in Ohio and neighboring states. Paul Viall, Jr. will continue to operate the business from the Akron offices:

2101 N. Cleveland-Massillon Rd.
Akron, Ohio 44313

Alex Wilson — News of the death of Alexander Wilson on Wednesday, August 30, 1972 has been received from his office in London, England. Alex had suffered a stroke in 1969. However, he had recovered to resume his professional activities. He had undergone an emergency appendectomy just prior to his passing.

For many years, Mr. Wilson served as Chief Marketing Officer, Central Electricity Generating Board, England. As an introduction to CEGB's new book, *PFA Utilization*, Mr. Wilson wrote, "The fact that over six million tonnes (sic) of ash... are now being sold annually, by the CEGB, amply demonstrates the commercial viability of the methods of utilization..." This fact amply demonstrates, to a great degree, the success of the dedication and leadership of a world leader in ash utilization and dear friend, Alex Wilson.

sponsored evaluation, the performance of the fly ash-sludge-lime material will be advanced to the West Virginia Department of Highways and others in the Appalachian Region. FHWA resources will be solicited to assist in the evaluation. Following this, a coordinated development plan will be proposed to the states, FHWA, ARC, utility and private industry representatives, to provide for the use of the fly ash based aggregate in primary roads and interstate construction in the Appalachian Region.

Illinois Interstate

Uses Boiler Slag

Recently, Central Illinois Public Service Company, the Illinois Dept. of Highways and Litchfield Bituminous Corp. took a major step toward making constructive use of a valuable by-product—boiler slag.

Boiler slag is a quality engineering material for many applications, including base material for roads. Boiler slag will be used as a base material in the construction of two overpasses on Illinois Interstate 55, where engineers determined that a material was required that was superior to the in situ material.

Boiler slag from CIPS's Coffeen Station was approved as the substitute base material after meeting all gradation specifications in tests conducted by both Litchfield Bituminous and the Illinois Dept. of Highways. Illinois, as well as the Highway Depts. in Indiana and Ohio, has specifications for boiler slag as aggregate. A number of other states have also used the material as base course aggregate, fill and wear-course anti-skid aggregate.

Seaboard Fly Ash

Builds Bagging Plant

Seaboard Fly Ash Company has recently begun operations at a new bagging plant in Baltimore, Maryland.

Ash from the Potomac Electric Power Company is bagged as pozzolan which meets ASTM requirements. The ash is presently being hauled to the plant in Seaboard's aluminum tankers from unit #4 of PEPCO's Potomac River Station. Two other PEPCO stations are future sources of pozzolan ash, according to Seaboard president Harvey Greenwell.

The new operation, with an 80-ton-per-day capacity, is set to produce 50 and 75 lb. bags of pozzolan. The company plans to expand operations to bag grouting mixes and ferro-cement. The material is normally palletized and covered with plastic, ready to haul. Private truckers, as well as Seaboard's own flatbed trucks, haul from the plant.

Seaboard's new testing laboratory provides support for the organization's ash marketing and construction inspection activities. The lab, located at company headquarters in Rockville, Md., is equipped to perform complete analyses and testing of fly ash and other materials as required by ASTM, AASHTO and others.

Approximately 125,000 to 150,000 tons of material will be required to complete the construction of the twin bridges spanning the tracks of the Chicago, Burlington and Quincy Railroad near Litchfield, Ill. Litchfield Bituminous has been hauling over 2,000 tons each day—using up to 24 tandem and dump trucks—to move the 150,000 tons of material from the storage pile at Coffeen Station to four large excavations on the construction site.

Engineering applications for boiler slag have been increasing throughout the country. Interest among state and federal officials and commercial enterprises is high. But a major project on an interstate highway is certain to stimulate even further activity across the country.

The successful completion of this project is certain to expand markets in the midwest, particularly in Illinois, for bottom ash and boiler slag in future road-building projects.

Bottom Ashes In Road Construction In W.Va.

(continued from page 1)



West Virginia State highway officials and a number of interested roadbuilders viewed the Rt. 2 project with a great deal of interest.



The roadbuilder finds boiler slag a welcome sight, especially in view of natural aggregate shortages which are becoming increasingly more acute.

Ultra-Modern Plant Uses Fly Ash To Produce Quality Concrete Block

Fly ash has been an important and profitable ingredient in the manufacture of concrete block for the past 16 years at Hagerstown Block Company. The Maryland company's experience reflects that of many concrete products producers throughout the country.

To Hagerstown Block president Jim Myers, the most important advantage resulting from using ash is the increased life of the working parts—reducing costly down time for repairs.

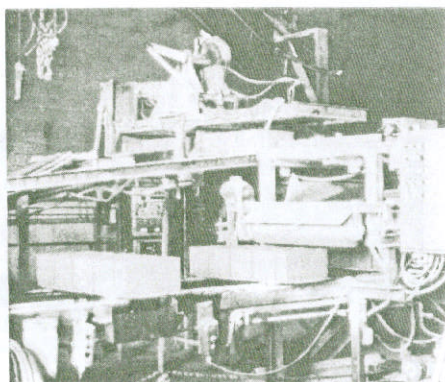
And this is extremely vital to the Maryland firm whose totally automated system, according to Mr. Myers, probably produces more units per machine than any other in the country. Each day, 33 thousand eight-inch equivalents (that's seven cycles per minute) are turned out.

Since coming into full production in August, 1971, Hagerstown's \$700,000 system has operated 20 hours per day and has produced over 5 million concrete blocks. To keep up this rate, the system must maintain constant equipment efficiency and unscheduled repairs must be minimized. Here, fly ash is a key factor. The spherical ash particles decrease abrasion and, therefore, extend the life of working parts. Mr. Myers says many items such as mixer liners and molds last about twice as long when ash is an ingredient.

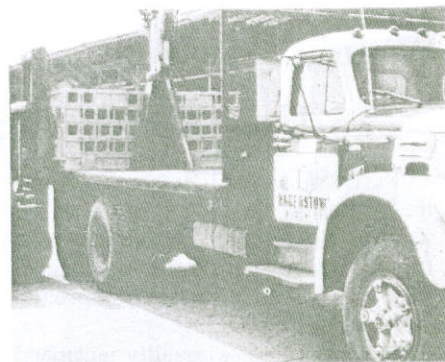
Other benefits found in a fly ash block are color consistency, smoothness, increased strength, lower permeability and decreased production cost reflecting reduced raw materials cost.

Hagerstown Block started using fly ash from Potomac Edison Company's R. Paul Smith Station at nearby Williamsport (six miles from the plant) in 1956.

The typical mix for light weight units, is: 150 lb. of fly ash, 475 lb. of cement, 2700 lb. of limestone fine aggregate, and 1300 lb. of expanded shale coarse aggregate. In their stone units, Hagerstown



Mixer liners and molds last up to twice as long when ash is an ingredient in the block mix.



Fly ash concrete blocks are delivered to a variety of jobs near Hagerstown, Md.

Block uses 150 lb. of fly ash, 450 lb. of cement, and 4600 lb. of limestone. Both Type I and block cement are used. The automated system uses a 12 Hr., 225° gas kiln cycle.

Four manufacturers provided equipment for the new operation—a unique layout engineered by Theodore M. Myers, Jim's dad. Aside from clean-up crews the new system is operated by two men.

The original block plant, started in 1946, also uses fly ash. The older facility, utilizing a standard block plant layout that is less automated, produces about 18 thousand eight-inch equivalents daily. This unit uses a 25-hour steam cure.

Fly ash enables Hagerstown Block to turn out a superior product economically since replacements are fewer and costly down time is reduced.

Reprints Available

"FLY ASH AS A STRUCTURAL FILL," by A. M. DiGioia and W. L. Nuzzo, General Analytics, Inc. The paper summarizes some of the field and laboratory research conducted in the Western Pennsylvania area to determine the engineering properties of fly ash used in structural fill. Reprints of the paper are being offered at no charge from the NAA.

"HOW FLY ASH IMPROVES CONCRETE BLOCK, READY-MIX CONCRETE, CONCRETE PIPE." Reprinted from CONCRETE INDUSTRIES YEARBOOK, 1971-1972. This useful pamphlet provides descriptions of and designs for using fly ash to produce quality concrete block, ready-mix, and concrete pipe. Available on request from the Association.

New Text Describes British Utilization

A new, highly attractive book has been published by England's Central Electricity Generating Board. The text describes the applications for fly ash and explains the methods of commercialization of the uses in the United Kingdom.

Since British ash utilization now exceeds 6 million tons annually (over 60% of production), the key to their marketing success is obviously valuable.

Anticipating the interest in this useful reference (shown at right), the NAA has made arrangements to obtain a bulk order to expedite handling. For those who are interested in obtaining one or more copies from the CEGB, contact the National Ash Association.



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