

FRANK SPANGLER

100' WELL IN CANYON  
ALL IN KEASBY

1-30-61

POZZ CEMENT

CON STORAGE  
REVAMPED

CRITICAL FEED →

FBD SPECS

SAME SIZE FEED

JOHN DAY, DAIN NOW

WILL GO INTO GEN PURPOSE WATER  
= SCRAPY PELLETS

POZZ CUTS HEAT BIG DINGS

LESS PERIN FOR CON PIPE

SAVES ↓

SOME STRENGTH LESS CONCRETE

GOOD WORKABILITY



OREGONIAN AUG 11, 1957

## Smithwick Products Plant Dedication Considered Boon to Vernonia Industry



This modern expanded shale processing plant of Smithwick Concrete Products, located nine miles south of Vernonia, will be opened August 15 with state officials participating.

Vernonia, a small town in the upper Nehalem valley, takes a positive step forward Thursday with the dedication of a new basic industry, the Smithwick Concrete Products, at Haydite, about nine miles south of the city center.

The Smithwick plant has been removed from Portland to its quarry with incorporation of a number of new design features, and is scheduled to be in operation just prior to the opening ceremonies.

An open house, with ceremonies commemorating the start of production will be at 4:30 p. m. at the plant site. This will be followed by a hospitality hour and dinner at the American Legion hall in Vernonia, sponsored by the chamber of commerce.

Governor Robert D. Holmes will be principal speaker at the dedicatory rites. Others to appear will be City Commissioner William A. Bowes, representing Terry Schrunk, Portland mayor; David Duncan, president Portland chamber of commerce; State Senator Dan Thiel, Astoria; J. R. Jensen, executive

director of the Oregon department of planning and development, and S. Carl Smithwick, president of Smithwick Products and past president of the National Concrete Masonry association.

Mayor D. E. Bayley, Vernonia, will give the welcoming address and Glen Hawkins, Vernonia, will be master of ceremonies.

To make the dedication an inter-city event, mayors of various Oregon cities have accepted invitations. These include Peter G. Cosovich, Astoria; S. Howard Davis, Hillsboro; Lester U. Raw, Seaside; S. H. Heumann, St. Helens, and Clifford P. Rowe, Forest Grove.

### Death Notice Scorned

It was earlier this year that Vernonia was written off as a town destined to become desolate because its lone major industry was a sawmill built in 1924 and which closed operations this year.

Residents of Vernonia, with a fast-talking chamber of commerce membership, scorned the

death notice and started seeking new industry.

The Smithwick plant is the first of what residents believe to be a brand new, diversified industrial expansion.

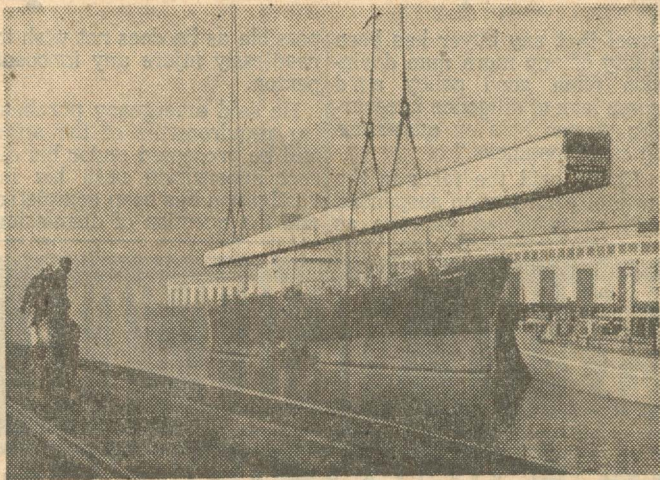
The new processing plant will produce lightweight aggregate which is often used in concrete in place of sand and gravel in order to reduce the dead weight of structures and to increase insulation.

The material is extensively employed in the manufacture of lightweight masonry units. Among the monolithic concrete structures in the Pacific Northwest using this lightweight aggregate are the decks of the Tacoma Narrows bridge and the Interstate bridges at The Dalles and Umatilla; the University of Oregon medical hospital in Portland; the NEW Ridpath hotel of Spokane, and many structures in western Canada.

Headquarters of Smithwick will remain in Portland as will the block manufacturing plant. The firm also has a block plant in Eugene.



## *Pile Arrives for Job*



First of a series of 120-foot prestressed concrete piles has been delivered to Terminal No. 4 for test-driving at new bulk unloading pier. Piles are 20 inches square and are hollow through centers to save weight. This pile, made by Empire Pre-Stressed Concrete of Oregon, Inc., weighed 19 tons when lowered over side of dock to barge. Piles will be driven next week by General Construction Co. under contract with Commission of Public Docks.

# THE BEND BULLETIN

and CENTRAL OREGON PRESS

Robert W. Chandler, Editor and Publisher

Entered as Second Class Matter, January 6, 1917, at the Post Office at Bend, Oregon, under Act of March 3, 1879

Phil F. Brogan, Associate Editor

William A. Yates, Managing Editor

Riley D. Allen, Business Manager

Loren E. Dyer, Mechanical Supt.

An Independent Newspaper

---

4 The Bend Bulletin, Thursday, July 31, 1958

---

## *Lloyd Williamson, 1897-1958*

A new industry, the quarrying and processing of pumice, was in its infancy 16 years ago when Lloyd A. Williamson came to Bend. Pumice at that time was largely being "mined" in the Crescent country, where debris of ancient Mt. Mazama covered the earth.

Lloyd Williamson had great faith in the future of pumice as a light weight aggregate for construction use. But he was not satisfied with the product that was going out from Central Oregon. Nor was he satisfied with the process used in making the light-weight building blocks.

Much research was needed before pumice could be fully accepted as a building material, Williamson realized. Through the efforts of William E. Miller, also of Bend, and Williamson, studies were launched, and properties of several Oregon pumice deposits were studied.

Slowly, pumice regained most of the recognition it had lost in earlier years. It became accepted as a good building material. Out of Central Oregon were shipped carloads of Deschutes pumice, to many parts of the west, and, in some cases, to the east.

It was in 1955 that Lloyd Williamson was recognized for his engineering and research work in the pumice field. He was elected first president of the National Pumice Institute, at a meeting in the southwest.

In the early years of the quarrying of pumice in this region, it was the tendency of many to refer to pumice as "volcanic ash". Such reference greatly aroused Lloyd Williamson. Pumice, he stoutly maintained, was not an "ash"—it was a fine building material with a history that dated to ancient days. Pumice was used in the concrete used in building the Roman Pantheon, and the Colosseum.

Lloyd Williamson was a pioneer in pumice in the region. But he found time for civic activities. Also, he served his church faithfully. And he was known throughout Oregon for his leadership in American Legion work, especially in earlier years.

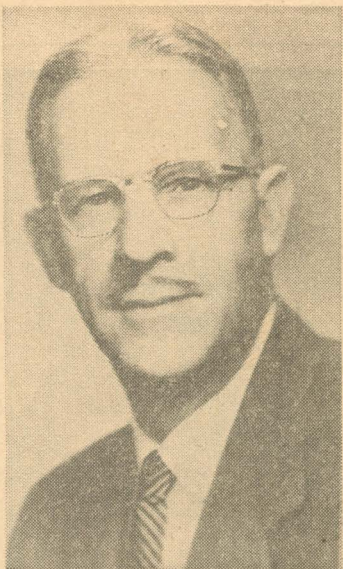
Lloyd Williamson was just preparing to take life a bit more leisurely when he was injured in an accident, at a pumice plant. Death came Tuesday night, result of a heart attack.

The industry he served so faithfully through the years will suffer as the result of his death. The community will miss him.



DIED

7-29-58



LLOYD A. WILLIAMSON

Funeral on Friday

## Williamson Rites Due on Friday

Funeral services for Lloyd A. Williamson, 61, will be held Friday at 10 a.m. at Trinity Episcopal Church. Mr. Williamson died Tuesday night at St. Charles Memorial Hospital, after suffering a heart attack. He had been a patient there since being injured in a fall July 11.

Mr. Williamson, a Bend resident 16 years, was a native of Muncie, Ind., and a veteran of World War I. Long active in the American Legion, he was a past commander of the Medford post and a past district commander in southern Oregon. He was an Episcopalian, and served a number of times on the vestry of Trinity Church here. He was former owner of Cascade Pumice, Inc.

He is survived by his wife, Clare E., 701 Broadway Avenue, and a sister, Mrs. Louise Isaacs, Medford.

Burial will be in Deschutes Memorial Gardens. Niswonger-Winslow is in charge of arrangements.

LABORATORY CERTIFICATE

CHARLTON LABORATORIES

2340 S. W. Jefferson Street

P. O. Box 1048  
Portland 7, Oregon

*Keasey Shale  
from Sunset Tunnel  
Haydite Plant*

Atwater 9663

TO: Empire Building Material  
1205 S. E. Grand Ave.  
Portland 14, Oregon

LABORATORY NO. 22061

SUBJECT: Shale

DATE February 18, 1949

CORRECTED COPY

Moisture	26.8 %
	<u>% dry weight</u>
× Loss on Ignition	6.83
× Silica (SiO <sub>2</sub> )	57.90
× Aluminum (Al <sub>2</sub> O <sub>3</sub> )	16.40
× Iron (Fe <sub>2</sub> O <sub>3</sub> )	5.33
× Calcium (CaO)	3.32
× Magnesium (MgO)	1.63
× Sodium (Na <sub>2</sub> O)	2.82
Potassium (K <sub>2</sub> O)	0.76
× Sulfate (SO <sub>3</sub> )	2.32
Sulfide (S)	0.08
Phosphate (PO <sub>4</sub> )	0.08

CHARLTON LABORATORIES

( J. M. Hogl ) signed

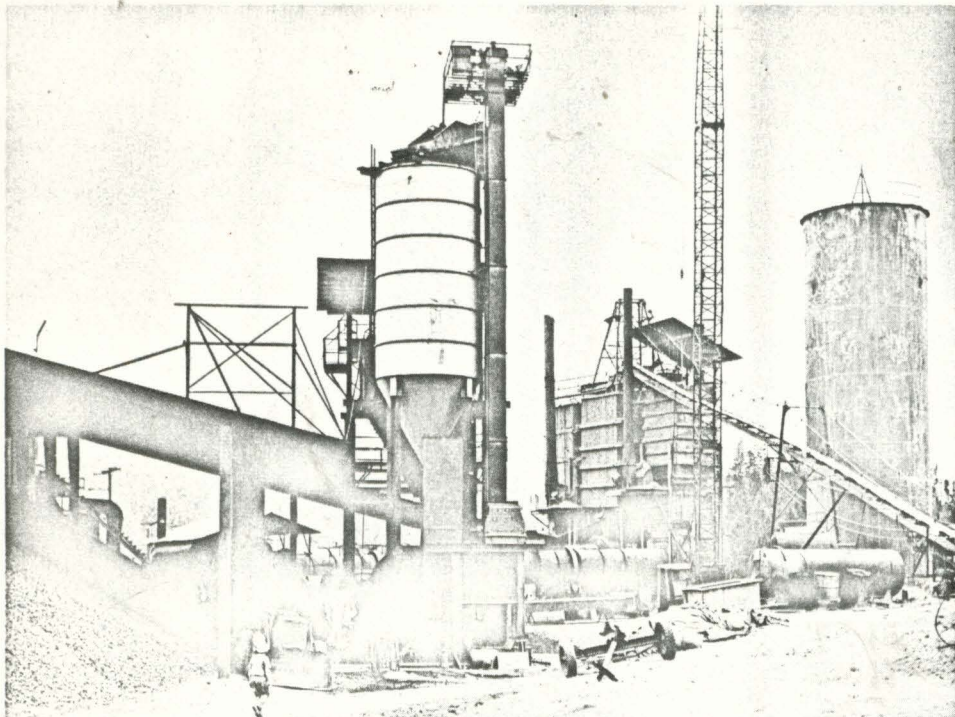
J. M. Hogl  
Chief Chemist

jmh/da  
3c

*Courtesy of  
Mr. H.L. Priest  
EA 5121*



## EMPIRE LITE-ROCK COMPLETES QUARTER-MILLION EXPANSION



A quarter-million dollar expansion of plant and equipment has been completed by Empire Lite-Rock, Inc. at their location on the Sunset highway near Banks. The new facilities will be used primarily for the processing of pozzolan, a finely ground cementitious material used as a partial replacement of Portland cement in concrete.

Empire Lite-Rock, Inc. has completed a quarter-million dollar plant and equipment expansion of their facilities on the Sunset Highway near Banks, according to their president, Frank Spangler. The new facility has a capacity of 150 tons of pozzolan per day.

Processing of pozzolan, a finely ground cementitious material used as a partial replacement of Portland cement in concrete, is the primary purpose of the new plant. It will operate on a 24-hour, three-shift basis, seven days a week, to meet production requirements.

Although thousands of tons of pozzolan have been supplied for dams built in the Pacific Northwest, the new Empire plant is the first built specifically to serve the commercial and industrial market.

Main office of the firm and other plant facilities are located in Portland.

### GROUP FORMS TO AID ARLINGTON DEVELOPMENT

Formation of a community development corporation has been announced by a group of Arlington area business and agricultural leaders. Purpose of the organization, known as the Arlington Builders Corp., will be to foster economic growth of the community.

The corporation will provide assistance to new and expanding industry in the area, according to Lee D. Connor, president. Other directors of ABC include Marion T. Weatherford, rancher; Jack Harford, former mayor of Arlington; John Krebs, rancher and bank director, and Henry W. Krebs, rancher.

## TEKTRONIX FORMS NEW DIVISION TO SERVE DATA, OFFICE FIELDS

Formation of a new division of Tektronix, Inc. which will design and manufacture display instruments and large-screen monitors has been announced by Howard Vollum, president of the Beaverton-based firm.

Feasibility studies conducted during the past year resulted in the decision to form the new division which will capitalize on one of the company's major technical advances in recent years: development of a simplified, rugged storage cathode-ray tube.

Establishment of the new division marks Tektronix' first diversification into a field other than laboratory cathode-ray oscilloscopes, in which it is a worldwide leader.

Development of a simplified, rugged storage cathode-ray tube and the company's resulting storage technology indicates applications in fields such as the computer industry and office equipment market.

Vollum said that among possible developments would be large-screen monitors to provide remote, rapid readout of information for computers and instruments capable of transmitting written data over both long and short distances. These instruments also could provide permanent copies of such information.

### White Stag, Warner Merger Contemplated

Merger of Warner Brothers Co. and White Stag Manufacturing Co., Portland-based apparel firm, has been agreed upon in principle on a pooling of interests basis. The agreement is subject to the approval by the boards of directors and shareholders of both firms. Individual organizations of the companies and their product identities would be preserved, under terms of the plan.

White Stag's net sales for the nine months ending Aug. 31 were \$25,875,776, an increase of approximately 15 percent over the corresponding period of 1964.

### TRUCKING COMPANY EXPANDS TERMINAL

Bend-Portland Truck Service has purchased an additional three acres adjoining its present two-acre terminal site in the Port of Portland's Swan Island Industrial Park for expansion of terminal facilities.

The additional land will be used for immediate expansion of the firm's service and maintenance shop facilities, according to Wilfred E. Jossy, president. The expansion is needed to provide for rapid growth of the company's business volume, he said, noting that total revenues will exceed \$2.3 million this year.



CARL SMITHWICK

1-15-59

LOTS OF ORDERS ON BOOKS

92  
2/15/59  
DUNNING SPARKS THERM WINTER

SKYSCRAPER IN SEATTLE

LLOYD CENTER

ALL - FLOATING BRIDGE HOOD CANON

~~REFRAC~~ DECS

REFRACTOR - IN BAGS HI-AL CEMENT

2000° F - OIL REFINERIES - POLICE PLANT

BLOCKS - DECORATIVE UNITS

CHAS BRUCE SHAW WINDON

100 STYLES OF BLOCKS PRODUCED

BY SMITHWICK.

CUSTOM HOUSE.



FRANK SPANGLER  
AL-4 6535

1-15-59

NOT RECORD FOR 5' BEAMS

112' x 12" - 85,000 LBS EACH PRESSURE

SARE BEAMS - 130" deep LASH

SINGLE T<sup>BEAM</sup> 8' WIDE (SOON)

ROOFS & FLOORS - 100 SPAN

AGG FURNISHED - READY MIX - LOTS OF IT

LEAD CENTER - YWCA - JOHNSON BLDG

STEEL BRIDGE DECK -

ROUNDED B2 GOOD

98% LIVE ROCK BLOCK

SHIP AGG TO SEATTLE FOR READY MIX  
R. B. A.  
MED  
OLYMPIA  
SPokane

STATE HIGHWAY USED HOPE PRESTRESSED

BRIDGES - O-PASS

PRE. S PILING - 13" OETAG - 65' LONG  
20" SQ - 120 - DOCK  
800 PSI



## SHALE FOR LIGHTWEIGHT AGGREGATE

When sampling a shale outcrop to determine the bloating properties of the shale it would be well to remember that the greater the ratio of ferrous iron to ferric iron the greater the probability of a satisfactory bloat. This is the gist of an address by W. Arthur White at the Mid-America Minerals Conference during October 1958. He calls attention to the fact that outcrops are weathered and the iron content of the shale has oxidized but if the weathered material is stripped away the unoxidized material of most of the samples examined was found to be self-expanding, that is, needed no additive. In other words, bring in unweathered material only.

S.L.B.



## PRODUCING AGGREGATE FROM EXPANDED CLAY BY SINTERING PROCESS

A decade of development and pilot plant work on a new lightweight aggregate called Aglite has culminated in the opening of a 30-35 cu. yd. per hr. plant at Marietta, Ohio. Interest is centered on the claim that virtually any type of clay in the country may be used in a unique sintering process to produce a cellular, high strength, inert aggregate. Briefly, the process involves mixing raw clay with pulverized coal and feeding this mixture onto a grate traveling through a gas-fired ignition chamber. Steam and gases from the burning coal puff up the clay, leaving a cellular mass. Production costs are claimed to be substantially less than for other manufactured aggregates.



March 24, 1960

TO: H.M.D.  
FROM: R.S.M.

SUBJECT: Ross Island Sand & Gravel interest in expanded clays

Mr. Muirhead of Ross Island was in the office yesterday inquiring about deposits of expandable clay in northwest Oregon. Ross Island is going into the pre-cast and pre-stressed field. They also export considerable quantities of aggregate from this area, much of it by river barges.

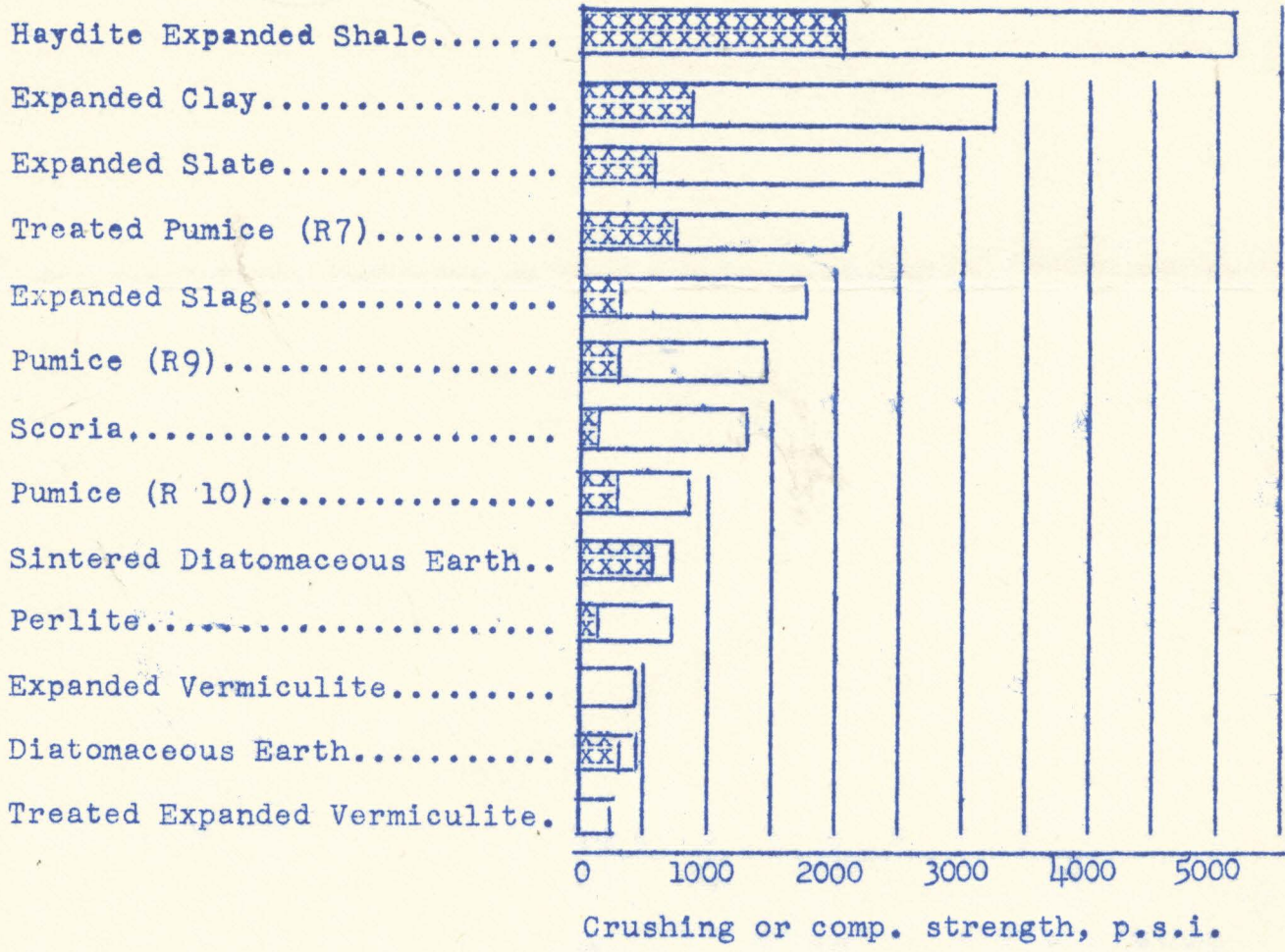
I showed them the Lightweight Aggregates Short Paper (which they bought) and Oil and Gas Investigations Map 42 on NW Oregon which shows the distribution of the Keasey etc.



Ross Island would like a deposit fairly close to the river so that they could lower their transportation costs. They realize that it might take considerable looking and even more testing to first locate and then appraise a property which might be suitable. I told them we would help them all we could, but did not offer them anything concrete, pending your return. They will probably call in the near future.

Incidentally Muirhead was quite appreciative of your efforts in connection with the sand and gravel bill last session.



COMPARISON OF CRUSHING STRENGTHS OF AGGREGATES TO COMPRESSIVE STRENGTHS OF CONCRETES \*



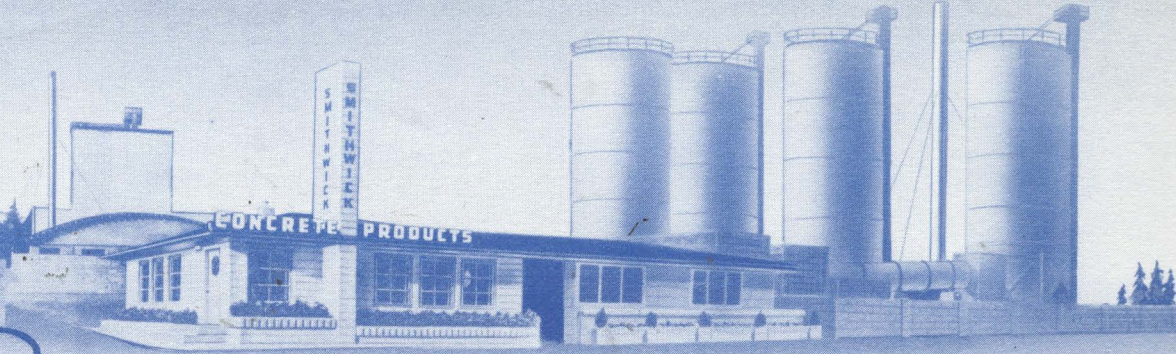
 Aggregate, average strength for 1 in. compaction  
 Concrete, average of 28 day strengths for 5 & 7 bag mixes

\* From tests conducted by National Bureau of Standards published by Housing and Home Finance Agency.

SMITHWICK CONCRETE PRODUCTS  
 1750 N. E. LOMBARD PLACE WEBSTER 7723  
 PORTLAND, OREGON



PERMANENT AS MT. HOOD



# Smithwick Concrete Products

PORTLAND ☆ EXCLUSIVE MANUFACTURERS OF *Haydite* ☆ EUGENE  
1750 N. E. LOMBARD PLACE • PORTLAND 11, OREGON • TEL. WEBster 7723

May 21, 1952

## I M P O R T A N T    A N N O U N C E M E N T

### Pre-Blended Haydite Now Available

TO THE BUILDING INDUSTRY OF THE PACIFIC NORTHWEST:

We are happy to announce that we are now in a position to blend the two finer sizes of Haydite aggregate here at the plant - - the 3/8" to 3/16" and the 3/16" to 0" - - to any ratio you or your customers or clients desire. This will permit the utmost in flexibility of operations and the optimum in workability, strength and density.

And may we also remind you that - -

1. Our freight rates on expanded shale are the lowest to any point in the Pacific Northwest?
2. That for uniformity of quality, including strength, lightness of weight, workability and density, our Haydite is among the finest obtainable anywhere in the world?

Our material was chosen for some of the most outstanding new projects in this region in recent years, including:

The Tacoma Narrows bridge  
The nationally famous Caravan Inn in Spokane  
The new University building in Missoula, Montana  
The 13-story Ridpath Hotel in Spokane  
The deck of the bridge to span the Columbia river  
at The Dalles, now under contract  
Hundreds of other structures in Canada, Oregon,  
Washington and Montana.

We'd be pleased to furnish you with complete information concerning our products upon request.

Yours very sincerely,

S. CARL SMITHWICK, President

SCS:m1  
CL 52a

NO OTHER BUILDING MATERIAL OFFERS SO MUCH FOR SO LITTLE



## EXPANDED SHALE STUCCO.

Frank Spangler reports (May 15, 1952) that his company is experimenting with stucco prepared from expanded shale aggregate. The shale is crushed after firing to 8- mesh and is used for both coats. Spangler indicated that if the material proves satisfactory they could undoubtedly recover the fines lost in the kiln and use them for this purpose. The aggregate apparently trowels well and has good adhering qualities in addition to being considerably lighter than standard plaster sand.





INSULATING VALUE OF VARIOUS TYPES OF MASONRY WALLS \*

Rating as to Value of U. on Walls or Insulating Value	First X= 8 in. Haydite Value U.	Second X= 8 in. Clay Tile Value U	Third X = 8 in. Brick Value U.	Fourth X = 8 in. Concrete Value U.
Description of Combination of Materials Used in Walls and Value of U				
8-in. Wall, 2 coats cement base paint exterior, no interior finish..... U=	.243	.409	.500	.560
8-in. Wall, 2 coats cement base paint exterior, 1/2-in. plaster direct..... U=	.235	.385	.460	.520
8-in. Wall, 2 coats cement base paint exterior, Furred 3/4-in. Wood Lath and plaster..... U=	.185	.266	.300	.320
8-in. Wall, 1-in. Stucco Exterior, 1/2-in. plaster direct interior..... U=	.230	.370	.446	.500
4-in. Brick, 8-in. backup, furred, 3/4-in. Wood Lath and plaster..... U=	.171	.240	.240	.280
4-in. Brick, 8-in. backup, No Interior Finish..... U=	.220	.340	.360	.440
U = B.t.u. Conducted Through One Sq. Ft. of Wall per Hour per 1° Difference.				

VARIOUS TYPES OF COMMONLY USED WOOD FRAME CONSTRUCTION

Type of Construction	Wall Conductance
Wood Siding, Paper, 1-in. Sheathing, 2x4 Studs, Wood Lath, 1/2" Plaster	U = .250
1-in. Stucco, Paper, 1-in. Sheathing, 2x4 Studs, Wood Lath, 1/2" plaster	U = .300
4-in. Brick Veneer, Paper, 1-in. Sheathing, 2x4 Studs, Wood Lath, 1/2" plaster	U = .270

\* From tests conducted by J.C. Peebles, Armor Institute of Technology



TRANSMISSION OF SOUND BY WALLS

From Tests by Paul E. Sabine, Ph.D., of Riverbank Laboratories, Geneva, Ill.

Type of Construction Tested	Weight Per Sq. Ft.	*Average Reduction 128-4096	* Average Reduction 128-1024
4-in. Haydite Partition Unit & total of 1-in. Gypsum Plaster.....	23.2	38.0	36.1
8-in. Haydite Building Unit and 1-in. Gypsum Plaster.....	43.5	40.1	37.2
2x4-in. Wood Stud, Wood Lath, Plastered.....	18.0	29.4	28.0
3½-in. Gypsum Plaster on Metal Lath.....	32.5	36.1	34.3
2½-in. Gypsum Plaster on Metal Lath.....	23.2	33.3	30.5
4-in. Clay Tile and ½-in. Gypsum Plaster.....	22.0	32.0	30.8
3-in. Hollow Gypsum Tile, Unplastered.....	11.1	24.0	22.3
3-in. Solid Gypsum Tile and 1¼-in. Gypsum Plaster.....	25.4	34.3	32.6

\* The "Average Reduction Values" are in "Sound Sensation Units" and are taken as the Measure of their Relative Sound Insulating Merits.



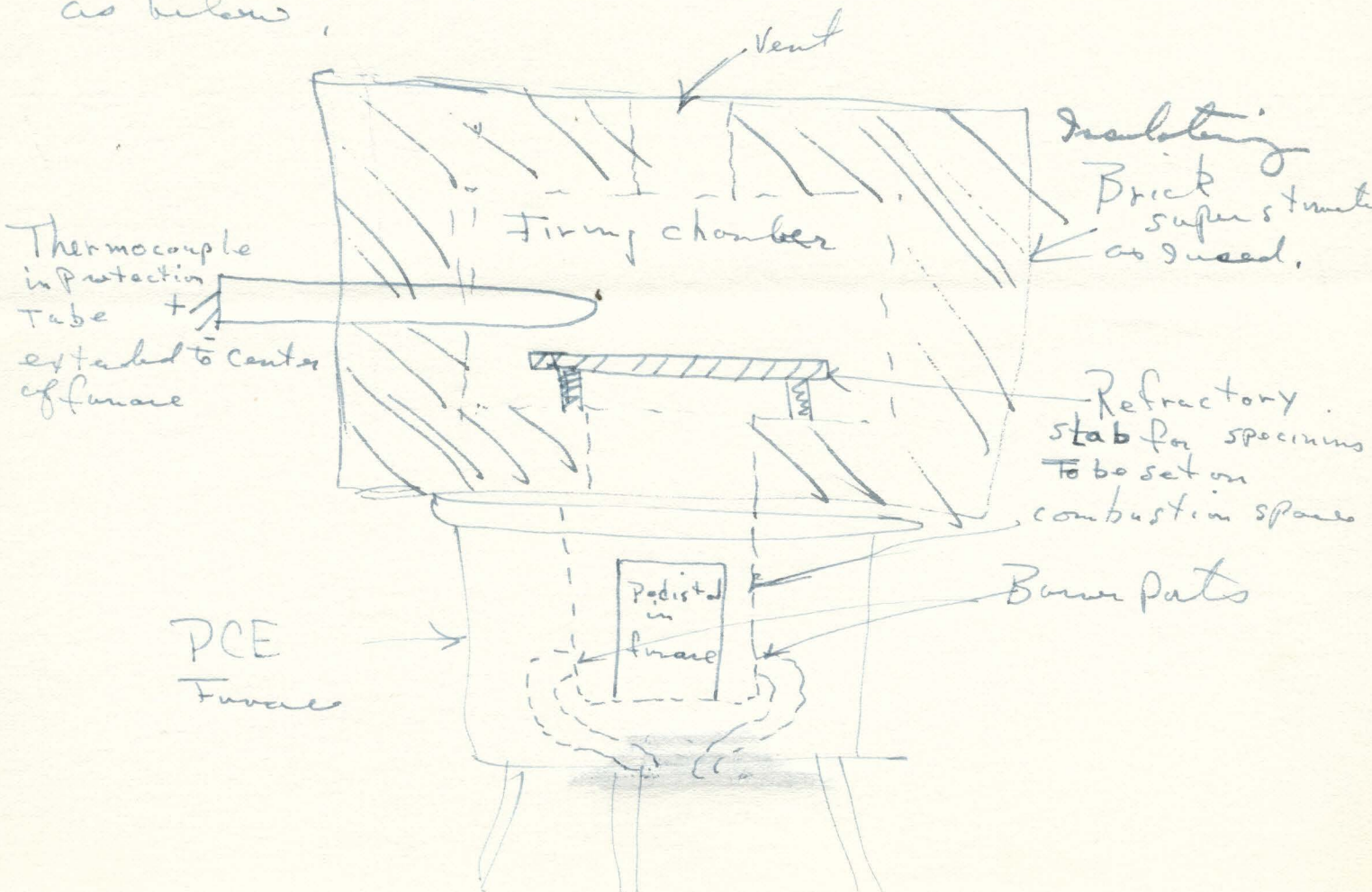
# Time-temperature data

The time-temperature data obtained from the laboratory-furnace runs are of the greatest importance in indicating the likelihood of commercial usefulness + in predicting the correct conditions to be followed in rotary-kiln operation.

(and)

Dear Ralph:

The above is a good standard group of tests + data collection method. The kiln I would suggest using is the super on top of the PCE Furnace, as below.





Buffalo, N.Y.  
December 27, 1950

Dear Ralph, Jones & all,

Received your letter asking about the P.C.E. Furnace as a test kiln for bloating. If you install the superstructure of insulating brick I used, on top of the P.C.E. Furnace it will be O.K. but without the super, the wind & convection in the firing chamber are too great & you can't keep the specimens in any one place.

I looked up the literature in the A.C.S. Journal & found the enclosed article. I think with perseverance, & thought June or Sam's can translate it for you.

The complete article is in the Portland library but I have extracted the laboratory method from the article for you.



It is the only explanation I know of that is simple + direct. Also the test of PH solves a lot of trouble in screening out unbleached clays or shales. I don't think you have to crush the shales as they suggest + reform into pellets. But you do as you wish.

I don't think you expected to get such a involved explanation of that little second paragraph in your letter but this is what happened.

(You should like this) The way the weather has been Portland isn't bad. Temperature today was about 10 above zero + Humidity was 95%. Damp + Cold.

Get that wood in edgewise + then wedge it in well. The rest isn't what we cracked it up to be.

Sincerely  
Charles.



1- or 2-inch lumps are selected, & the remainder of sample (2) is ground to pass 20 mesh screen. Ordinary clays are ~~not~~ Ground to pass 20 mesh also.

The ground material is mixed with water to a plastic workable state & water needed & workability in general is recorded. These data may be of commercial importance if pelletizing is necessary.

The plastic mass is made by hand into small briquets or cubes about  $\frac{1}{4}$ " x 1" x  $\frac{1}{2}$ " : a brass or steel mould is employed as it is difficult to avoid laminations, or slickensides or uneven density in large specimens when worked by hand.

the small briquets are dried until hard.

### Heat Treatment

The lumps & dried briquets are divided into two sets of specimens. one set is placed in a cold furnace & heating is started. The initial stage of heating should be slow through the water of crystallization stage; about 2 hours should be taken to reach 1000° to 1200°F. Full heat is then applied & firing is continued in 2 hours until a temperature of 2400°F is reached. At 100°F intervals starting at 1800°F draw trials are made & continued until the last piece is removed at 2400°F.

Three trial specimens from the second set are inserted into the empty furnace now at full heat,



and allowed to remain 5 - 10 - 15 minutes respectively. The temperature is then adjusted & the furnace is permitted to reach equilibrium at a temperature 100°F lower. Another set of trials is inserted & drawn at 5, 10, 15-minute intervals. This is continued until the whole temperature range is covered (1500°F) The exact range, of course, depends on the action of the clay. When the clay sags down before reaching the higher temperature, the heat range is naturally cut short, & treatments are made accordingly.

collection of Data

① Relative weights & Volume increases.

These data are obtained by standard water-immersion apparent or bulk specific-gravity determinations. It is necessary to use this method since the quantity of the material run in laboratory furnace is insufficient for making determinations by standard container method. (standard method of test for Unit Weight of Aggregate C29-42, 1948 Book of ASTM standards, Part II, P 474.)

② Type of Surface Structure as Evidence by roughness or smoothness

These data are obtained by visual observation & generally are not of great importance; they do

① however, indicate the degree of vitrification as well as whether or not the material is likely to be absorbent. When whole pellets, are to be used a very smooth glazed surface is essential & the data is more important.

### ② cross section.

an approximate picture of the internal structure may be obtained by breaking a pellet. The most satisfactory method, however, is to slice specimen on a diamond saw & noting structure with binocular microscope & unaided eye.

### ③ Water Absorption

Water absorption data are obtained by the usual method of weighing dry, & weighing again after immersion in water for 24 & 48 Hrs.

### ④ Relative Crushing Strength:

may be determined approximately by breaking the pellets with fingers. To obtain actual compressive strengths, it is necessary to make standard test units of concrete & form in 2" cubes, curing & running compressive tests.



Place specimens on refractory slab and use thermocouple to determine temperature. Cement section of side so as to facilitate removal as desired. Remove specimens with tongs. Keep atmosphere as near neutral as possible or slightly oxidizing, not reducing or in a vitid atmosphere of alkalis or lead.

Don't overload any carbonaceous slates or ~~well~~ shales. The slates expand along the cleavage plane or bedding & swell like accretions Pleats.

## Testing of Clays For Lightweight Aggregate

Abstracts Taken from above covering Laboratory operation.

Pilotplant Rotary Kiln, <sup>also</sup> outlined + determinations + tests necessary for relative comparison of products are described in article.

### Types of Clay

Clays + shales best adapted to production of lightweight aggregates contain certain amounts of impurities to bring about a pyroplastic condition, accompanied by a gaseous evolution. Impurities include iron compounds, alkaline earths + alkalis, carbonaceous material + perhaps water under contained conditions.

A secondary chemical determination, that of pH is about 90% correct in prediction. Clays with a pH lower than 5 seldom float; those with a pH higher than 5 usually do

The quickest way to correlate reaction with pH ~~that~~ is to run an actual bloating test in the laboratory.

### Sample Preparation

about 1 lb of original clay sample is cut out by quartering to obtain a representative portion. This sample is then dried from 12-48 hrs in an oven between  $65^{\circ}\text{C}$  +  $110^{\circ}\text{C}$  + reduced by crushing. If sample is a shale several



August 5, 1960

Dr. Hal J. Kelly, Ceramic Engineer  
U. S. Bureau of Mines  
Northwest Experiment Station  
217 Roberts Hall  
University of Washington  
Seattle 5, Washington

Dear Hal:

Recently I had occasion to visit the McMinnville Brick Company and talk to Mr. S. B. Nicoll, Jr., who is operating the plant. They have the only continuous tunnel kiln in Oregon, and Nicoll is extremely interested in new processes and developments. He mentioned that he was considering doing something with expanded shale and might even set up a small kiln during the slack season. I told him that you could probably give him some assistance, and I also discussed the matter with Hollis. Hollis feels that we should encourage Mr. Nicoll as much as possible, and perhaps the three of us: McMinnville, the Bureau, and our Department can work out something. Have you any ideas?

Sincerely,

Ralph S. Mason  
Mining Engineer

RSM:lk