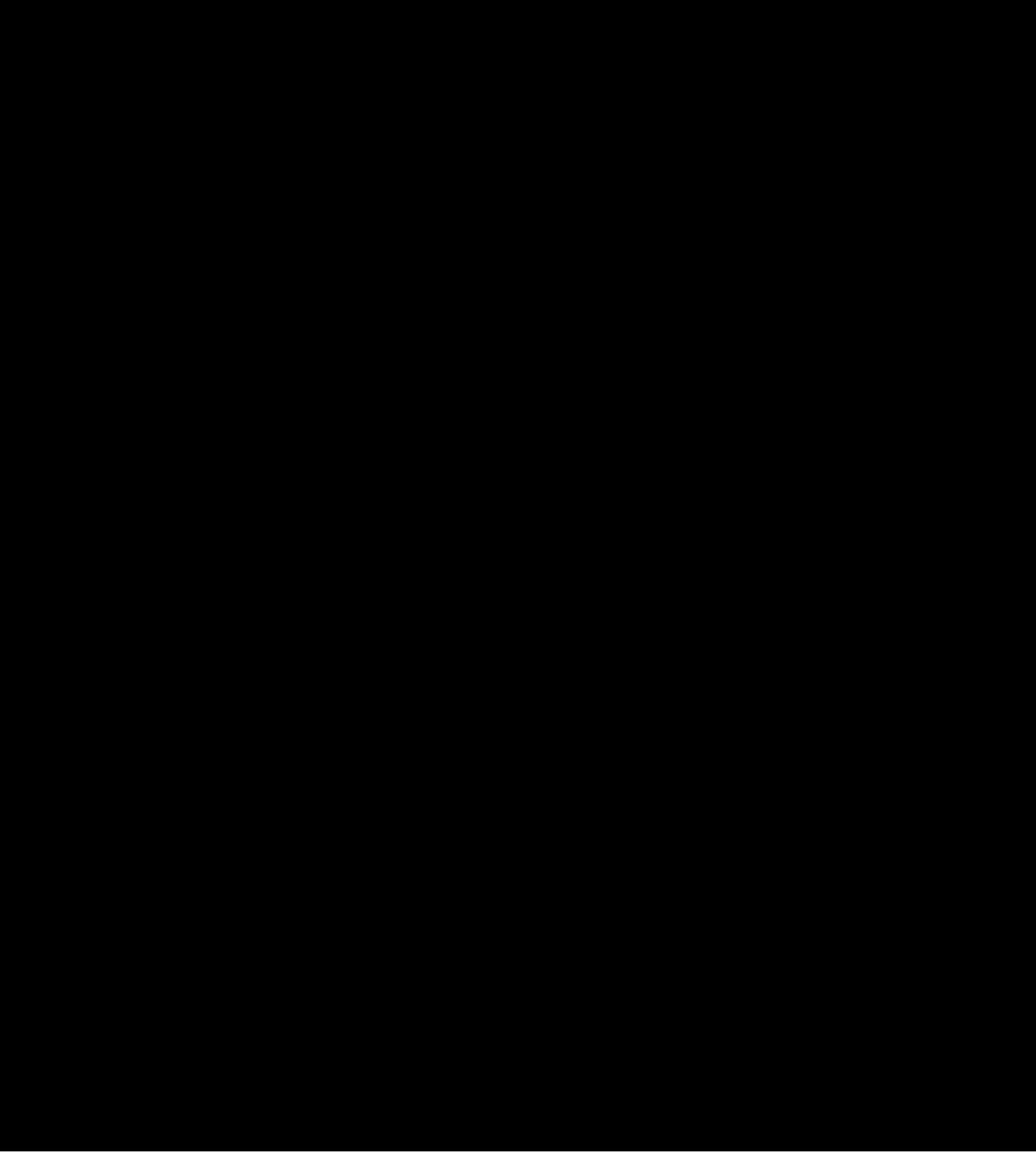




Pure Lead and Oil Paint Helps Build Thriving Business

FINNAREN & HALEY, INC., is one of Philadelphia's largest paint dealers and enjoys an exceptionally enviable reputation. From a modest start nineteen years ago the firm now operates four fine paint stores. The secret of this remarkable success has been a thorough knowledge of paint and painting and an earnest desire to give customers quality products at fair prices.

For those of its customers who desire to buy ready-mixed house paint, Finnaren & Haley has always made up its own paint, starting with pure white lead paste as the base. This paint is marketed under the firm's own name, and on this product its reputation is banked. The pigment of this paint has always contained at least 80 per cent pure white lead, and for about seventeen years has been 100 per cent white lead. This is the paint that the members of the firm are quick to admit has been one of the most important factors in building its fine business.

In this way Finnaren & Haley has given its customers absolutely the best mixed paint available. The effect of this upon its business is readily understood by remarks, referring to other products sold,



One of Finnaren & Haley's fine paint stores. Notice what an advertising point they make of their pure lead and oil paint

often heard in its stores, such as, "I know if Finnaren & Haley recommends it. I can rely on it."

This firm realizes that white lead is the only pigment upon which it can depend to yield a paint of the quality it is willing to sell. Despite the fact that this paint is sold at approximately the same price as other good house paints and that the ingredients actually cost more, the profit

is as great or greater because the intermediate profit of a grinder is eliminated. Years of study of paint formulation have taught that the greater the white lead content of a paint the longer will be its useful life and the better will be the surface for repainting. Over a period of years the customers, too, have learned this, and the firm has reaped the benefit accordingly. Likewise, every can of this paint sold under Finnaren & Haley's name has been an advertisement that has brought new customers to its stores and widened its reputation. The firm is equally careful of the quality of every product it handles, and its success clearly demonstrates the value of this policy in the long run. They have capitalized the fine name of pure lead paint.

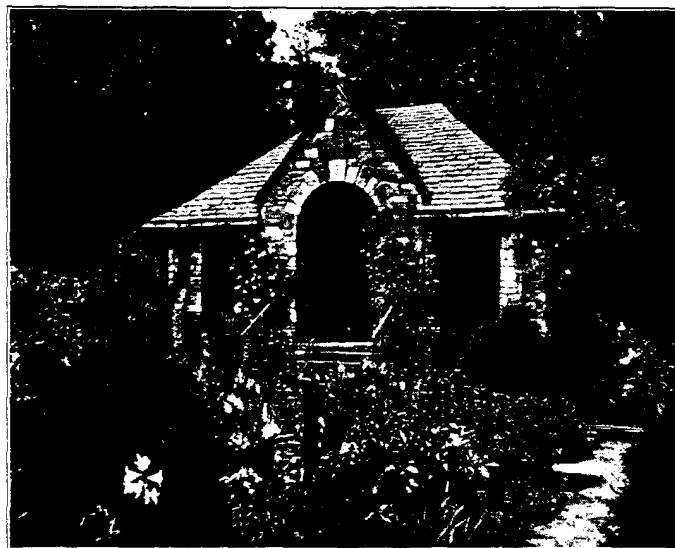


Finnaren & Haley's other stores. The slogan, "The Home of Pure Lead and Oil Paint," is proudly and prominently displayed.



Lead in a Garden

THIS photograph and that on the cover show better than words can tell the distinguished beauty of lead gutters, leader-heads and leaders. What they cannot show is the pleasing color scheme formed by the soft gray of lead contrasting with the brilliance of the garden and blending with the stone and slate of the little house. Lead leader-heads may be purchased from stock designs or they may be modeled from the designs of the architect. And lead roof-drainage systems are exceptionally practical, for they require no maintenance or repairs.



W. F. DOMINICK, NEW YORK, ARCHITECT

WURTS BROS.

Century Old Lead-Calked Joints in Water Mains

IN the City of Philadelphia are to be found several miles of lead-calked bell and spigot cast-iron pipe more than 100 years old. The remarkable feature of these water mains is that they are still in use and giving perfectly satisfactory service. Running under each side of Chestnut Street from Broad to Delaware is a line of 10 in. pipe extending for more than a mile. One of these lines was laid about 1821 and the other about two years later. As far as may be learned these lines have served with minimum repair to pipe or joints for about 110 years and are still going strong.

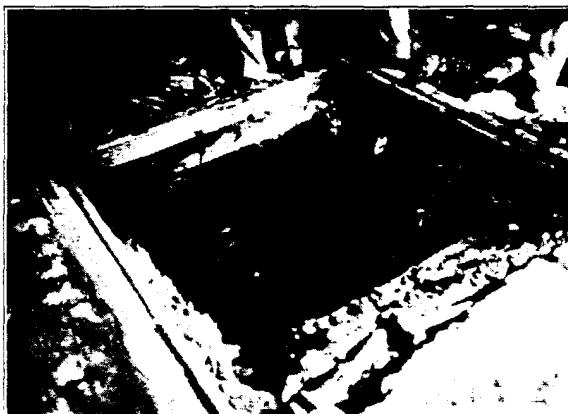
Recently the city uncovered a small section of another line 100 years old at Fifth and Federal Streets.

It was 6 in. cast-iron pipe. Both pipe and joint were in excellent condition. A section of the pipe was cut out and removed as a relic of historical and scientific interest. Incidentally, the lead was cut out of the joint and used again, testifying to the everlasting quality of the metal.

The Chestnut Street pipe lies on either side of a street-car track and under one of the city's busiest thoroughfares, yet vibration had failed to affect adversely the lead-calked joints in 110 years. The joint uncovered at Fifth and Federal was exactly under the middle of a car line, but it, too, was unaffected by vibration.

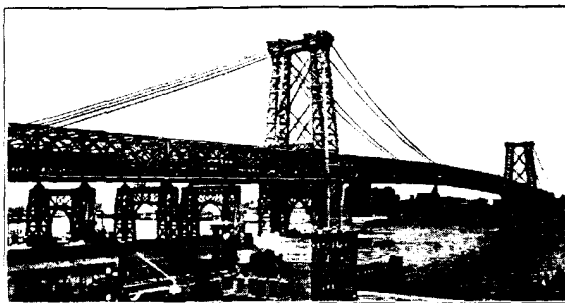
This truly astounding service can not be matched by any other jointing material. Aside from being unaffected by age, lead is pliable enough to allow for settlement of the ground without injury either to joint or pipe. Hard, rigid jointing materials, if they do not themselves crack under stress, are liable to cause the pipe to crack, because something must give. Likewise, as this experience indicates to perfection, vibration does not affect the efficiency of leaded joints. No other calking material possesses the combination of desirable characteristics found in lead.

Lead for jointing purposes can also be obtained in the form of lead wool, which needs simply to be calked into place without the use of heat. It can therefore be used under water and in other places where a molten material can not.



COURTESY, U. S. PIPE AND FOUNDRY CO.

Where a section of 100-year-old cast iron pipe was removed from between street-car tracks, lead from the century-old joint was used again



COURTESY, DEPT. OF PLANT & STRUCTURES, NEW YORK
Williamsburg Bridge, East River, New York

AS a result of the article which appeared in the March issue of LEAD entitled, "Lead Paints Give Lasting Protection to New York Bridges," the Association has received a number of requests for the exact formulæ of paints used by the New York City Department of Plant and Structures in painting the numerous great bridges under its supervision. Feeling that others may be interested in these formulæ, they are printed below:

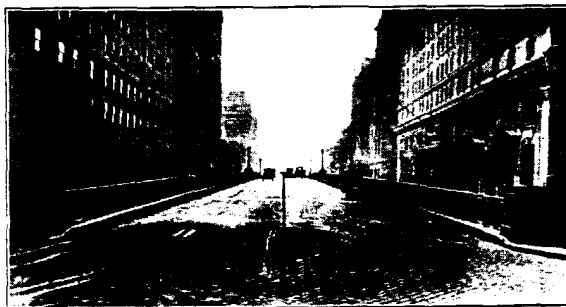
- Undercoats—25 lb. dry red lead
 $\frac{1}{2}$ gal. raw linseed oil
 $\frac{1}{2}$ gal. boiled linseed oil
 1 gill petroleum spirits
 Finish Coats—100 lb. commercial hard paste white lead carbonate
 2 gal. raw linseed oil
 2 gal. boiled linseed oil
 2-2 $\frac{1}{2}$ oz. Chinese blue in oil
 19 oz. burnt umber in oil

These quantities make about 7 gal. of paint.



COURTESY, DEPT. OF PLANT & STRUCTURES, NEW YORK

Park Avenue ramp at Grand Central Terminal, New York. Even the concrete ceiling is painted with white lead.



COURTESY, DEPT. OF PLANT & STRUCTURES, NEW YORK

How a Great City Protects Its Bridge

Of course, to get the excellent results obtained by the Department of Plant and Structures, careful selection of the materials used to make up these paints is essential. To this end, New York City has drawn up very comprehensive specifications which assure them of getting only the best materials for these purposes. These specifications are too long to reproduce in full here, but some of the important points will be mentioned.

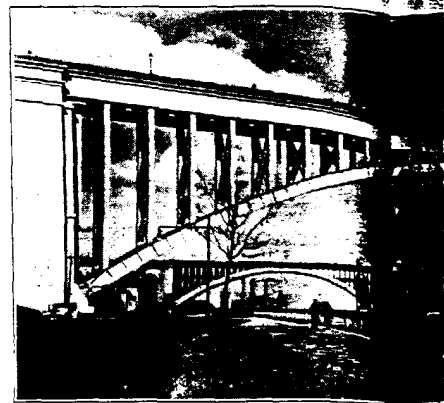
The red lead should contain at least 90 per cent true red lead, the balance practically pure lead monoxide. Following are the requirements for the white lead pigment and paste:

The paste shall show on analysis and test:

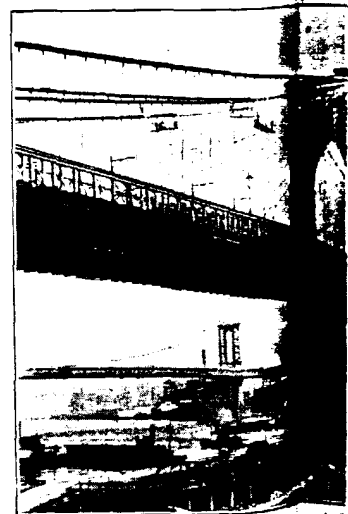
Requirement	Minimum	Maximum
Per cent by weight:		
Pigment	89.0	92.0
Moisture and matter volatile at 105° to 110° C. for 2 hours.....		1.0
Pure raw or refined linseed oil.....	Balance	Balance
Total residue retained on No. 325 screen, per cent by weight of pigment present		1.5
Consistency as oil paint:		
Film factor, milliliters	3.0	
Flow factor, seconds	90	140

The pigment after separation from the paste shall show on analysis:

Requirement	Min.	Max.
Per cent by weight:		
Lead Carbonate.....		
PbCO ₃	65.0	75.0
Total impurities.....		1.0
Lead Hydrate, Pb(OH) ₂	Balance	Balance

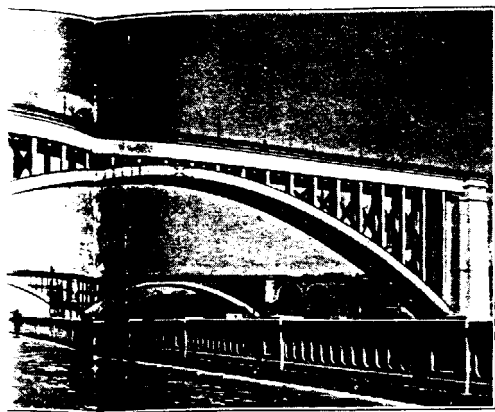


Washington Bridge, seen through the arch of H



Painting Brooklyn Bridge in Manhattan

s Bridges with Pure Lead and Oil Paint



EWING GALLOWAY

the arch of High Bridge, Harlem River, New York

Film factor and flow factor are determined by testing on the Gottsch Consistency Cone, developed in the laboratories of the New York Department of Purchases.

The blue used for tinting is that known as Prussian or Chinese Blue, and it has been found that if it contains about

40 per cent pigment and 60 per cent pure raw linseed oil there will be no tendency to cause streaky paint after mixing. It is also important to see that the burnt umber is equal in quality of shade, tone and brilliance to the best Turkey umber, free from grit and adulterants and containing not more than 5 per cent of lime by weight. If these precautions are adhered to the tinted white lead will hide the red lead nicely in one coat.

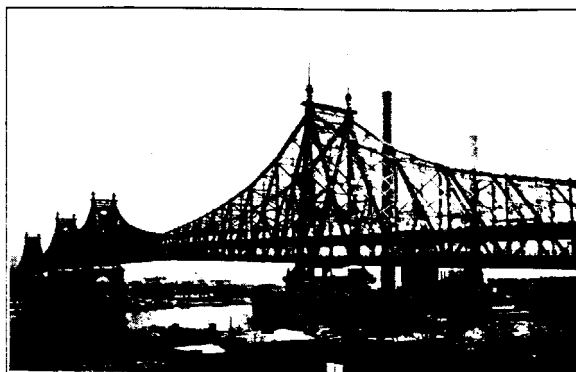
Substantially the same procedure has been followed by the Department for more than 40 years. The paints on these bridges are subjected to the most trying service. In fact, it is difficult to conceive of a locality having more rigorous exposure conditions. Changes of temperature are large and often rapid; salt air, snow, wind, smoke, and rain attack them. But highly adherent, elastic and durable lead paint

films stand up under all kinds of conditions and give the lasting protection that means economical, not cheap, paint. When it is time to repaint all that is necessary is to clean off the occasional bad spots with a wire brush or knife and touch them



EWING GALLOWAY

Manhattan Bridge with pure lead paint.
Manhattan Bridge in background.



COURTESY, DEPT. OF PLANT & STRUCTURES, NEW YORK

Queensboro Bridge, East River, New York

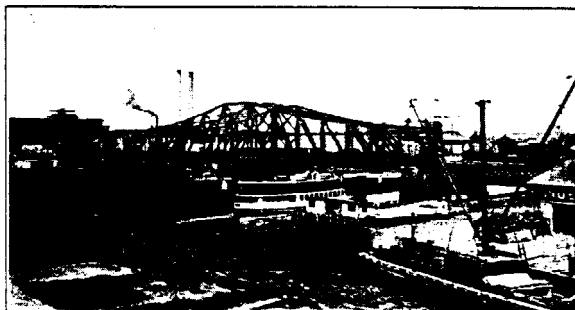
up with the red lead paint. Then the whole structure is gone over with the finish coat of white lead paint tinted to a pleasing bluish gray.

A pigment concentration of at least 28 per cent by volume is generally considered to yield the best lead paint. The formula given in this article for the finish coat figures several per cent less than this for reasons of economy. However, with the present low prices of pigments, the pigment concentration may be increased, giving even a more durable paint, without unduly increasing the cost. Instead of 4 gal. of oil, as shown in the formula, 3 gal., equally divided between raw and boiled oil, is suggested for 100 lb. of hard paste lead. If soft paste lead is used 1 gal. less of oil is required in either case.



COURTESY, DEPT. OF PLANT & STRUCTURES, NEW YORK

Above: 145th Street Bridge,
Harlem River, New York



COURTESY, DEPT. OF PLANT & STRUCTURES, NEW YORK

Left: Madison Avenue Bridge
at 138th Street, Harlem River,
New York

Famous Architects Are Large Users of Hard Lead

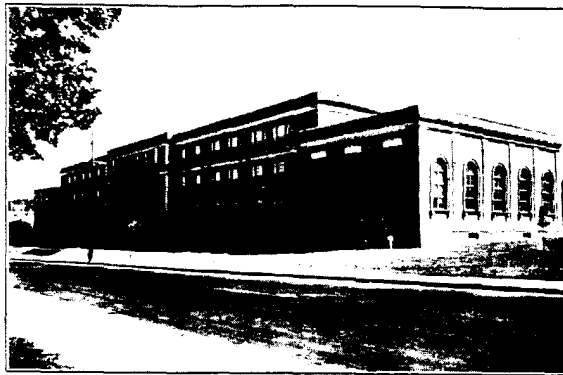
GUILBERT & BETELLE, famed Newark architects, are outstanding authorities on school design and construction. More than \$100,000,000 worth of school buildings in many states have been planned in their offices. The May issue of *Architecture* contains an article on school planning by Mr. Betelle and some twenty-five pages of photographs and plans of their work. Despite slightly higher first cost for material, this well-known firm has found it advisable to specify hard lead on a large number of jobs. They have used it extensively both for ornamental work—crestings and spandrels—and for the more purely utilitarian uses of roofing and flashing. The March issue of *LEAD* described and illustrated one of their most recent buildings, The Essex County Boys' Vocational School, Bloomfield, N. J., on which hard lead was used for crestings, spandrels and flashing.

Hard lead parapet wall flashing may be consid-



State Normal School, Jersey City, N. J.

ered as standard practice with them. An accompanying photograph taken on the roof of the Schuyler School at Kearny, N. J., illustrates this practice. The hard lead sheets used weigh 3 lb. per sq. ft. and measure about 4 ft. long. Through flashing is built into the wall under the coping. Where this emerges it is joined by loose-locked seams to other sheets. On the vertical surface horizontal loose-locked seams are provided every 18 in. and the

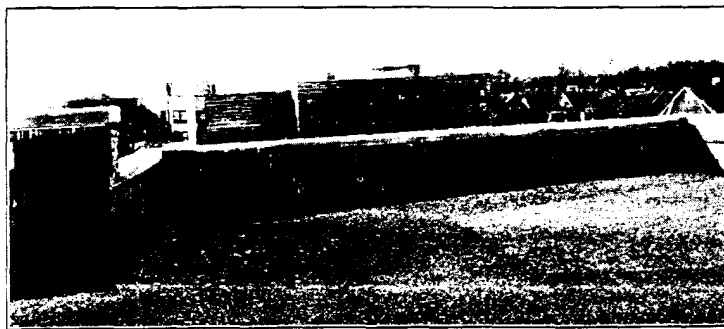


E. Pusey Warner School, Wilmington, Del.

lead supported at these joints by continuous hard lead cleats built into the masonry and folded into the seams. Vertical seams are also loose-locked. This method allows the sheets to expand and contract freely in all directions without strain.

On the flat surfaces shown in several details the seams are loose-locked, but one loop of each fold is filled with Vulcatex non-hardening compound. On the deck roofs small sheets measuring 2 ft. by 4 ft. are used and all lead roofing is laid over 30 to 40 lb. building felt. Cornice coverings, flashing, roofing sheets and other sheet lead is never calked directly into reglets in the masonry as such a procedure would prevent free expansion and contraction of the metal. To avoid the difficulty, continuous hard lead cleats are calked into the reglets and the sheets loose-locked to the cleats. The sheets of hard lead are never fastened by means of nails or screws passing through them, but are held by cleats folded into the joints and nailed in place. Ends of cleats are folded back to cover the nail heads. Roofing sheets and cornice covering weigh 3 lb. per sq. ft.

Hard lead is the quality metal for architectural purposes. This point is demonstrated by the class of architects who specify it. Its slightly higher first cost is more than offset by a life considerably longer than that of any other common metal, by the ease with which it may be worked, by the fact



Hard lead parapet wall flashing, Schuyler School, Kearny, N. J.



*Hard lead deck,
Garfield School*



*Hard lead deck roof with Vulcatex-
loose lock seams, Garfield School,
Kearny, N. J.*



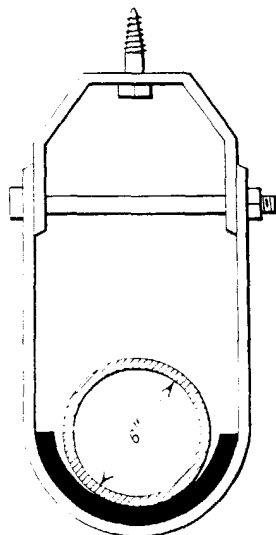
*Hard lead cornice covering,
Garfield School*

that it will not stain adjacent light-colored materials, and by its own pleasing color. As local conditions may alter the methods of applying hard lead, users are urged to consult with manufacturers or the Lead Industries Association for specific recommendations.

EDUCATIONAL BUILDINGS ON WHICH GUILBERT & BETELLE HAVE USED HARD LEAD

Maplewood High School	Maplewood, N. J.
Essex Avenue Grade School	Maplewood, N. J.
South Mountain School	South Orange, N. J.
Demonstration School, State Teachers College	Upper Montclair, N. J.
Lincoln School	Nutley, N. J.
Alfred I. duPont School	Brandywine-Hundred, Del.
Grover Cleveland High School	Caldwell, N. J.
Gregory Avenue School	West Orange, N. J.
William Penn School	New Castle, Del.
St. Elizabeth School	Wilmington, Del.
Geo. F. Baker High School	Tuxedo Park, N. Y.
New Rochelle High School	New Rochelle, N. Y.
Lincoln School	Lincoln, Del.

Greenwood School	Greenwood, Del.
Boiler House, Administration, Health and Physical Education Buildings, Trenton State Teachers College	Ewing Township, N. J.
E. Pusey Warner School	Wilmington, Del.
Cos Cob School	Cos Cob, Conn.
Morristown High School	Morristown, N. J.
Jersey City State Normal School	Jersey City, N. J.
Washington School	Summit, N. J.
Forest Avenue School	Glen Ridge, N. J.
Weequahic High School	Newark, N. J.
Essex County Girls' Vocational School	Newark, N. J.
Newark Academy	Newark, N. J.
Kearny High School	Kearny, N. J.
Chapin Hall, Montclair State Teachers College	Montclair, N. J.
Ellendale School	Ellendale, Del.
Mary C. Williams School	Wilmington, Del.
Jefferson Junior High School	Jamestown, N. Y.
Central High School	Newark, N. J.
Great Neck High School	Great Neck, L. I., N. Y.
Newark School	Newark, Del.
Laurel School	Laurel, Del.
Essex County Boys' Vocational School	Bloomfield, N. J.
East Orange Junior High School	East Orange, N. J.
Garfield School	Kearny, N. J.
Barringer High School	Newark, N. J.
Newark Public School of Fine Industrial Arts	Newark, N. J.
Jefferson School	Summit, N. J.
Schuyler School	Kearny, N. J.
Yantacaw School	Nutley, N. J.
Marshallton Consolidated School	Marshallton, Del.



Lead Vibration Isolation on Pipe Lines

ARCHITECTS often require that pump lines be insulated from hangers by a vibration absorbent material so that vibration in these lines will not be transmitted throughout a building. A method often used is to insert a piece of sheet lead between the pipe and hanger. There are other materials that may be and are used, but lead, which is the only common metal that deadens vibration, has the advantage of being unaffected by age and moisture so that it will do the required job permanently. It is also inexpensive and easy to work.

A piece of 6 or 8 lb. sheet lead is cut a little longer than the bearing surface of the pipe and wide enough so that it may be doubled over and still be as wide as the hanger. This strip of lead is then inserted between pipe and hanger. It may be fastened to the hanger in any convenient way, but fastening is usually unnecessary. This method has been used by one of New York's leading plumbing contractors on some of the city's finest buildings.

Lead Plays Part in Another Bathroom Remodeling Job

THIS is another story of the highly successful bathroom remodeling that has paid Mr. J. F. Kuenzli of the Hillcrest Plumbing Co., Oak Park, Ill., so well. A somewhat different problem is presented here than occurred in the job described in LEAD, January, 1932. This installation is a problem of space.

The room is only 6 ft. 6 in. by 14 ft. 6 in. A shower stall was desired, as with most modern bathrooms. There appeared to be no space for it, but by the removal of the linen cabinet shown in one of the photographs the necessary space was provided.

As the entire walls were to be done in marble, the stall also had to be done in this material. Shiplap joints were provided between wall and floor slabs as a waterproofing measure. Not satisfied with this means alone for protecting walls and ceilings below from leakage, the usual pan made of 6 lb. lead was installed.* The concrete foundation on which it rests was asphaltum coated as a protection for the lead. It not only provides a cushion

*Detailed in LEAD, May, 1931, and January, 1932.



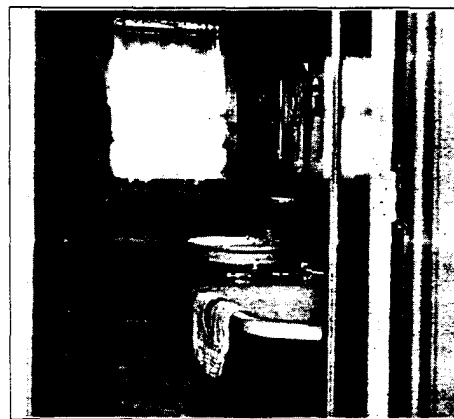
The linen cabinet in the left-hand photograph was removed to make room for the shower stall at right



COURTESY, DOMESTIC ENGINEERING



COURTESY, DOMESTIC ENGINEERING



Bathroom before and after remodeling

A Booklet About Lead Pipe

A brochure completely descriptive of lead pipe and its uses has just been published by the Lead Industries Association. It should be in the hands of all water works engineers, chemical engineers, plumbing contractors, jobbers, architects or others who have occasion to use, sell, or specify piping. In addition to listing the Association's new standards of lead pipe sizes and weights adopted by leading manufacturers, it discusses in detail lead service pipe and lead interior plumbing, lead pipe in the chemical industries and suggestions and precautions for the proper use of lead pipe. There are also sections dealing with the history, manufacture and grades of lead pipe, with methods of making joints in lead pipe, with calking lead and lead wool, and with lead "burning" or welding. A number of useful tables are included. The Association will be glad to supply a copy free of charge upon request.

ion on which the lead rests, preventing mechanical injury, but should any moisture from any source get under the lead, it prevents corrosion by free lime that may be present in the cement.

From the illustrations, a good idea of the fine appearance of this job can be gained. The care taken in the shower construction shows that the work is not only high class on the surface. Mr. Kuenzli takes no chances of later being responsible for ceilings and walls below ruined by moisture.

Sheet lead is especially suitable for waterproofing of all kinds because it is extremely durable, is readily worked, and is soft and inelastic, which permits it to be dressed down snugly and evenly over the surface to be covered without any voids under it. This removes the danger of later settling, which would crack tile or other floors covering it.

The Lead Industries Association invites inquiries on any subject relating to lead pipe and its uses. It will be glad to cooperate without obligation in the solution of your lead problems. LIA25183