Pure Lead Paint for Rockland, N. Y., State Hospital

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State Architectural Division Specifies Pure White and Red Lead for Wood, Plaster and Metal.

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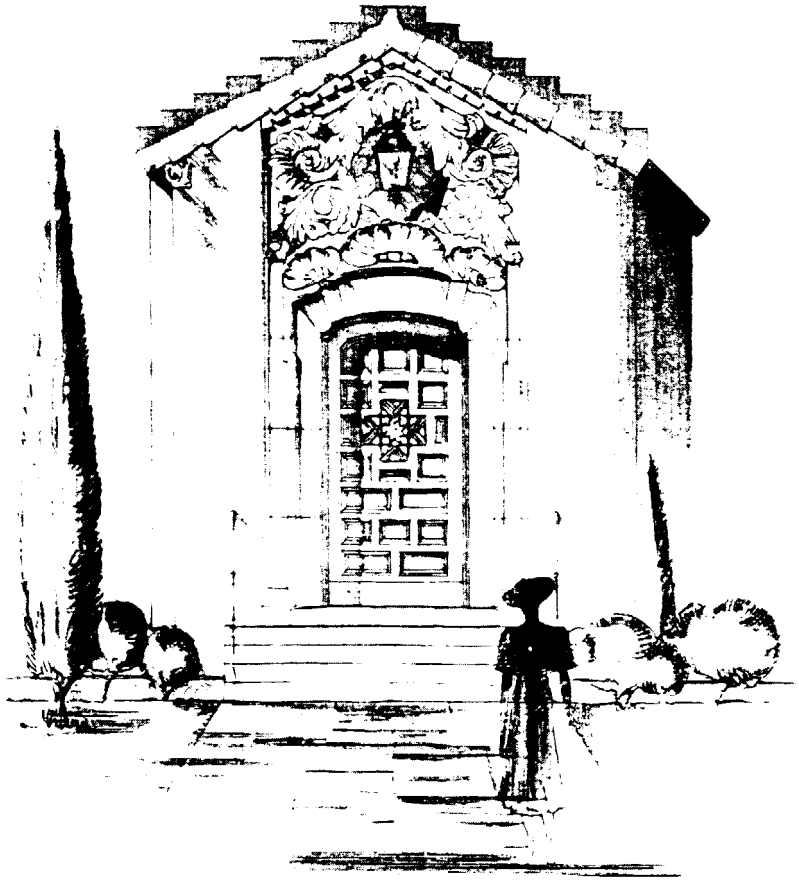


ENTRANCE DETAIL
CONTINUED TREATMENT GROUP
ROCKLAND STATE HOSPITAL
ORANGEBURG ROCKLAND COUNTY NEW YORK
DEPARTMENT OF PUBLIC WORKS DIVISION OF ARCHITECTURE
WILLIAM F. HAUGAARD
COMMISSIONER OF ARCHITECTURE

NEW buildings now being erected for the Rockland State Hospital at Orangeburg, N. Y., exemplify the high quality of paint specified in buildings designed by New York State's Department of Public Works, Division of Architecture. Lead pigments naturally are prominent in these specifications and as a result, except for special purposes, all the paint used on the new hospital buildings is either pure white lead or pure red lead.

Principal new buildings being erected at Orangeburg are three large five-story structures cross-shaped in plan. The two end buildings consist of dormitories, bed rooms, and other living facilities while the central building, which connects with both of the others on all floors, contains dining facilities with the service section at its center. The buildings are steel frame with a stucco exterior finish.

Structural steel except that encased in concrete, which was not painted, was given two coats of red lead, the shop coat being red lead of natural orange-red color and the field coat red lead tinted with lampblack to a brown. Other metal was given a red lead priming coat and two coats of pure white lead paint. All exterior and interior wood and plaster are painted with three coats of pure white lead and oil, tinted as required, except under certain special conditions, so that the bulk of the painting is done with pure white lead and oil paint. This is in conformity with the New York State Division of Architecture's standard specifications.

This reliance on time-tested white lead and red lead by New York State assures the taxpayers of a low annual painting cost, for long life can be expected between paintings and repainting cost is minimized because white lead provides an excellent surface for repainting without expensive preparation like burning and scraping. Almost invariably the practice of large users and

specifiers of paint, who have studied painting problems thoroughly, favors the use of white lead and red lead. Some of these practices of architects, painting contractors, federal, state and municipal governments, and railroads, have been reported in past issues of LEAD.

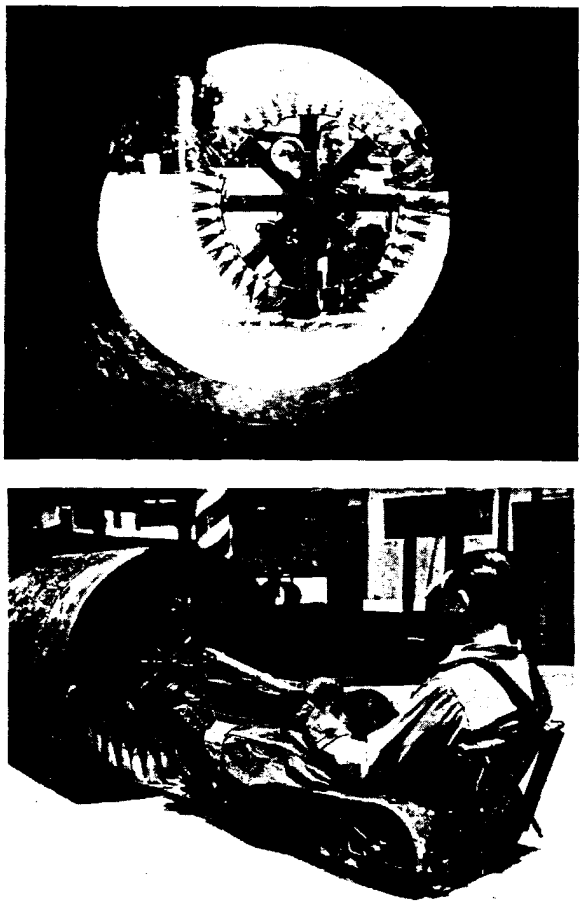
William E. Haugaard is Commissioner of Architecture of New York State and is responsible for the new Rockland State Hospital buildings. Turner Construction Co. is the general contractor and Kuehnle-Barker, Inc., the painting contractor.

Batteries Propel Unique Car for Pipe Line Inspection

LEAD-ACID storage batteries have come to the aid of the Los Angeles Bureau of Water Works and Supply in developing an ingenious device for inspecting enamel coatings on the interior of water mains. The device consists of a three-wheeled car just large enough to carry an inspector through 36 in. pipes. On the front of the car, a number of steel brushes, electrically connected, are mounted. These brushes make contact with the enamel surface and when they pass over spots on which the enamel coating is too thin or defective, they spark. These spots are marked and later painted to give adequate protection to the pipe against corrosion.

Power to propel the car and for the brushes, and to light a search-light which shows the way, is provided by two 140 amp. hr. lead-acid storage batteries. Thus by the aid of these dependable batteries it is possible to inspect the miles and miles of large underground mains that supply Los Angeles with water.

Lead-acid storage batteries are found to be useful by many engineers with perplexing problems. They enable dependable power to be brought to many inaccessible locations without expensive wiring. They are safe when external power sources might be dangerous. Lead-acid batteries can deliver large currents for short times, as in automobile starting batteries, when such is the demand, and are particularly useful in emergencies.



Two views of the storage-battery-operated car used to inspect pipe line enamel by Los Angeles Bureau of Water Works and Supply.

Red Lead and Cork Prevent Condensation on Metal

CONDENSATION on pipes and other metal surfaces may be prevented by covering them with a mixture of red lead and cork. After this protection is provided, final coats of paint may be used to obtain the desired decorative effect.

Red lead paste for this purpose is thinned only slightly so that it has nearly the consistency of paste. A mixture in the proportion of 100 lb. of paste red lead to ¾ gal. boiled linseed oil is about right. If raw oil is used instead of boiled oil, 1 pt. of drier should also be included. After the metal surface to be covered is thoroughly dried and wire brushed, the red lead is applied to a small area. Finely ground cork is then thrown against the wet paint or applied in other convenient ways. Other small areas are treated successively in this manner until the whole metal surface is covered.

After this first coat of red lead and cork has dried, two coats of white lead paint, tinted as desired, are brushed on. They should both be mixed in the proportion of 3 gal. raw linseed oil and 1 pt. drier to each 100 lb. of soft paste white lead. If the finish is to be dark, these last two coats may be red lead, tinted and mixed to ordinary brushing consistency.

Lead Ducts Exha
University of Delaw

Corrosion-Resistant Metal

PHOTOS BY THE COMMERCIAL STUDIO

Lead riser and horizontal main ducts in ventilating system for new University of Delaware chemical laboratories, before construction of partitions.

BEHIND the walls and above the ceilings of the new chemistry laboratory building of the University of Delaware, at Newark, Del., when it is completed, will be concealed an extensive system of lead ducts which will conduct foul air, fumes and gases from the building. Registers near the floors and ceilings connecting these ducts and ducts leading to laboratory tables and hoods, each with individual dampers, are all that are visible. Lead was selected for the purpose because it is highly resistant to corrosion and very durable even when exposed to the corrosive atmospheres found in chemical laboratory ventilating systems. A lasting material was naturally necessary because repairs or replacements would be particularly expensive in a concealed installation.

There are 52 vertical ducts, rectangular in shape, that collect the air from the rooms and conduct it to large circular ducts in the attic. The risers vary in size from 6 in. by 8 in. to 10 in. by 48 in., while the main ducts are from 24 in. to 36 in. in diameter. The risers are reinforced with horizontal steel bars, lead covered, which are built into the tile partition joints to support the ducts and are supported at the top during construction by temporary straps "burned" to the lead and passing over the steel beams. The horizontal ducts are encircled by 3 in. by 1/4 in. iron

Some of the lead risers in the chemical laboratory ventilating system, giving an idea of the vast extent of the installation.

A Balance to Measure Solder

USERS of solder and antimonial lead should be interested in a device made by Henry Troemner of Philadelphia that permits rapid, easy determination of approximate compositions of alloys containing lead and tin only or lead and antimony only. It is a balance, the scale of which is calibrated in tin or antimony percentages.

Balance, mold and test pie solder and antim

To determine the approximate composition of a batch of metal that is an alloy of lead and tin, a test piece of the metal is cast in a small mold provided with the balance, the mold being the shape of a truncated cone. Thus test pieces always have the same volume. When this is balanced on the scale, the percentage of tin present in the test piece may be read directly from the scale. The other side of the scale is calibrated in antimony percentages so that to determine the amount of antimony in an alloy of lead and antimony, it is simply necessary to follow exactly the same

Exha umes From New
law hemical Laboratory

letal ealed Ventilating System

Lead riser and main ducts with partition built. These are the same ducts shown on facing page and the inlet opening can be seen near the top of the partition.

bands at 36 in. intervals, which act both to brace the pipe and as hangers. Strips of lead are "burned" over the upper half of these circular straps thus keeping the top arc of the duct from sagging.

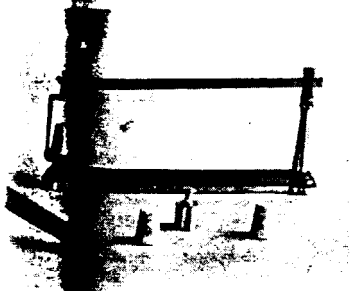
All joints in the lead duct system are lead "burned" so there is nothing but durable lead exposed to attack. Antimonial lead weighing 4 lb. and 6 lb. per sq. ft. was used. Five exhaust fans draw the polluted air and fumes out through this system.

An advantage enjoyed by lead for ventilating systems is that lead does not readily transmit sound and therefore the noise of blowers and rushing air and other sounds are not easily transmitted from room to room through lead duct systems, thus avoiding a common annoyance.

Chas. Z. Klauder, of Philadelphia, is the architect for the new building. The ventilating system was designed by Robert P. Schoenijahn, of Wilmington, Del., consulting engineer, and it was installed by E. G. Bihn, lead construction contractor, 5th and Grant Sts., Camden, N. J. Wm. D. Shellady, Inc., of Wilmington, Del., were the contractors.

A view of a main lead duct and laterals to serve the risers in the University of Delaware's chemical laboratory ventilating system.

ler Antimonial Lead Compositions



st pie termining composition of antime alloys quickly.

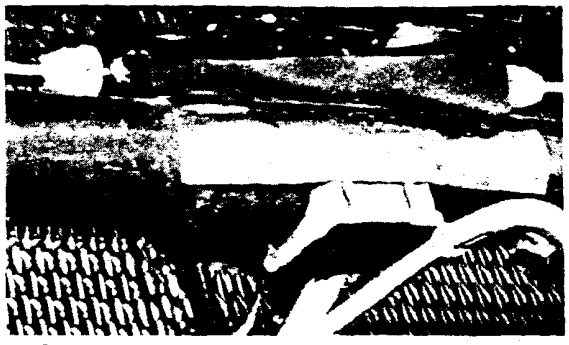
procedure as with solder but to read the other side of the scale.

Determining compositions in this way is possible because of the difference in specific gravity between lead and either tin or antimony. For instance, the specific gravity of lead is 11.38, of tin 7.35 and of antimony 6.76. Therefore, test pieces of constant volume will have different weights depending upon the proportions of lead and tin or lead and antimony in them.

Of course, this balance can only be used for a rapid, approximate determination of composition and can, in no sense, take the place of an analysis where accurate determinations are essential or where appreciable amounts of impurities are present, for it will not determine the presence of impurities and large amounts of impurities will throw off the results. It should, however, be very convenient for those desiring a means of knowing compositions quickly and approximately.

Lead Protection Aids Industrial X-Ray Applications

Portable X-ray unit for field inspection of welds. A protective lead shield is at the right in the picture.



Pipe weld under inspection with sheet of lead between tube and pipe and lead box for film cassette.

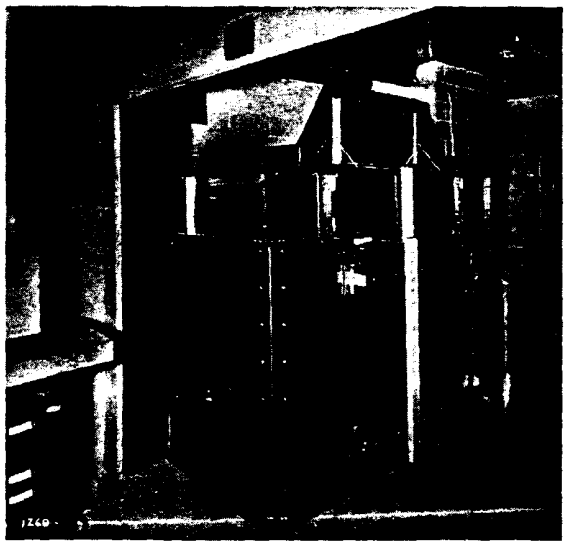
INDUSTRIAL application of X-rays, with the attendant lead protection they require, is of rapidly growing importance. For inspection of welds and castings and in other ways, such as inspection of citrus fruit (LEAD, May, 1937), the X-ray is becoming a great commercial and industrial aid.

Often these industrial applications require field inspection and for the purpose, portable equipment has been developed. St. John X-Ray Service, Inc., of Long Island City, N. Y., has generating equipment mounted on an automobile trailer and uses ray- and shock-proof type Metalix tubes connected to it by 30 ft. of cable. Such an arrangement is very mobile and flexible and may be taken from plant to plant or actually into the field to make welded pipe line inspections or for other purposes. Protection against the rays is provided by three 3 ft. by 7 ft. screens each made of two boards 1½ ft. by 7 ft. covered with 4 lb. sheet lead in one piece. They can be set up as required on field work and the construction permits folding as desired.

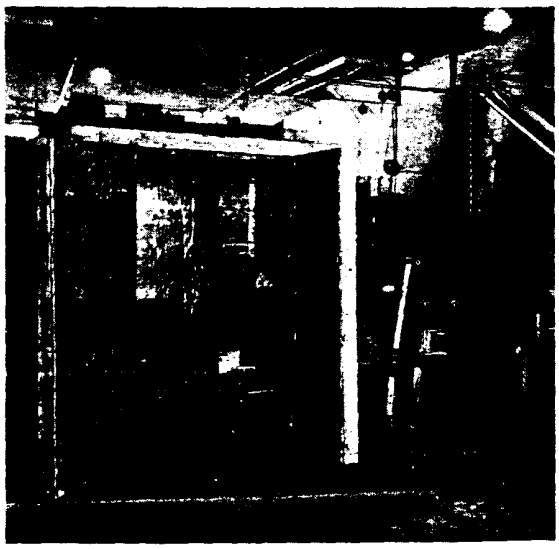
Lead is used in a number of other small but important ways in this work. The area between the tube and object being inspected, for instance a pipe, is covered with sheet lead ⅛ in. thick and the film cassette is placed inside a specially constructed lead box during exposures. Identification markers are made of sheet lead with numbers and letters punched through. Every film is backed by a sheet of lead to absorb scattered rays.

The same organization has installed X-ray equipment in the new Brooklyn Technical High School for instruction in industrial radiography. It is heavily lead-lined and can be used for fluoroscopic inspection as well as for photographic examinations.

In its main laboratory, the St. John X-Ray Service, Inc., has a lead-lined room, size 6 ft. by 6 ft. by 6½ ft. high, for X-ray examination of small objects up to large



Lead-lined X-ray equipment for instruction in industrial radiography, Brooklyn Technical High School.



Lead-lined room for X-ray inspection of castings, art and other objects in St. John X-Ray Service, Inc., laboratory.

castings, old masters and other art objects that do not require field inspection. In many ways lead protection is playing an important part in the development of X-rays in industry and without the protection of lead, this development would undoubtedly be greatly hindered.

Lead-lined box for X-ray inspection of large castings in St. John X-Ray Service, Inc., laboratory.

Minimum thicknesses of lead required to protect against X-rays generated by various peak voltages, as recommended by the National Bureau of Standards in its handbook HB20, *X-Ray Protection*, are:

Voltage	Minimum Thickness of Lead		Voltage	Minimum Thickness of Lead	
	mm.	in.		mm.	in.
75	1.0	0.039	225	5.0	0.197
100	1.5	0.059	300	9.0	0.354
125	2.0	0.079	400	15.0	0.591
150	2.5	0.098	500	22.0	0.866
175	3.0	0.118	600	34.0	1.339
200	4.0	0.157			

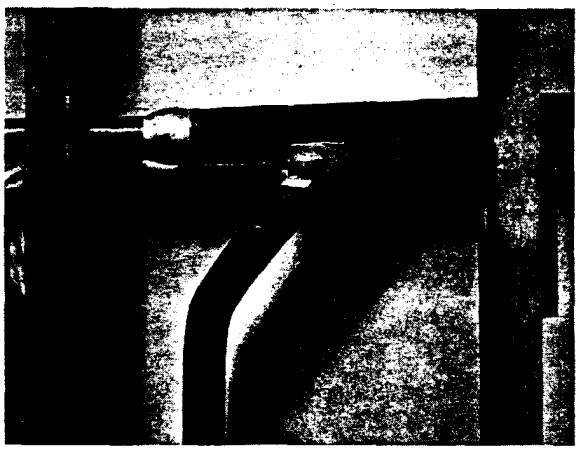
Lead Pipe Helps to Prevent Weakening of Buildings

ARCHITECTS take great pains to see that beams, joists and other structural members are designed of proper size to carry required loads. Yet despite this care and the knowledge that they have figured correctly, bathroom floors and walls and the ceilings below bathrooms often crack, tubs sag away from the wall permitting leaks, trim joints spread and other defects appear, frequently in all too short a time. Blame is usually placed on natural settlement of the building, but the real blame should usually be placed on something that can be avoided, generally without extra cost.

To install the piping concealed under the bathroom floor, the plumbing contractor must often cut into the joists and beams considerably in order that the runs of pipe may get by them. The weight of the concrete and tile floor and the plumbing fixtures makes the bathroom joists carry heavier loads than joists in other rooms. Naturally, if they are weakened by notching, sagging results.

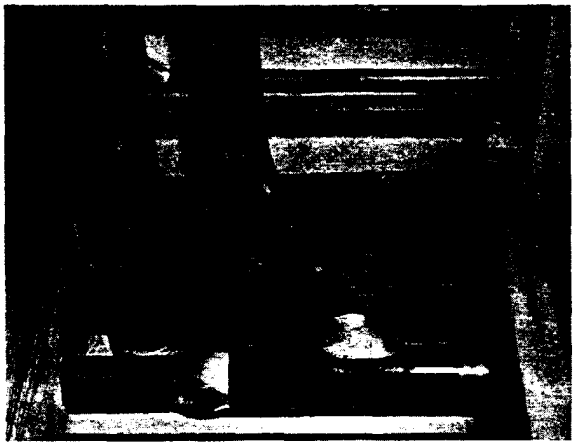
To avoid this, bathrooms may be planned by placing fixtures and stacks so that pipes crossing joists are at a minimum. However, rarely can this eliminate all cutting. Therefore, if pipes cross joists two things can be done. The joists may be notched and then strengthened by addition of another joist alongside of the first. This naturally adds to the cost.

Less expensive and more satisfactory is to specify that lead pipe be used and installed through holes bored in the joists. Boring does not weaken the structure to the extent of notching and by using flexible lead, the pipe can be reeved through these holes without making a lot of joints. Rigid piping cannot be installed in this manner except in very short pieces with many joints, a weakness, and even then the holes must



WURTS BROS.

Intersection of lavatory and bath trap vents, showing bored studs to prevent excessive weakening.



WURTS BROS.

Intersection of lavatory and tub wastes, with joists bored and lead pipe reeved through holes to avoid weakening of floor structure.

be larger. Therefore, the architect may preserve the strength of his structure and avoid future damage by specifying that piping be lead and joists and studs bored. At the same time, he gains this advantage without expensive reinforcement of the structure and also gains the durability, free flow, flexibility, bonded joints and other advantages of lead.

FRED HESS & SON

Exhibit of lead plumbing installation from which details on page 7 were taken, showing how lead pipe makes possible an installation with minimum weakening of structure.

Rockford, Ill., Now Requires Use of Lead Service Pipe

SECTION 1225 of the new Rockford, Ill., plumbing code, which was approved in April, 1937, requires that all water services be lead pipe. This is of particular interest because both lead and another kind of pipe had been permitted in the past and apparently the conclusion was reached, based on experience, that public interest would best be served by using lead only. This is not surprising, for lead services have such a long record of excellent performance under all sorts of conditions. The durable nature of lead itself and the thick walls of lead service pipe assure long life for Rockford's services and the flexibility of lead pipe will take care of ground settlement without damage or strain on the pipe. Wiped joints are required by the code and this type of joint, since it bonds the sections of pipe together, can not shake or vibrate loose.

FRED HESS & SON

Exhibit showing recommended method of installing lead water services and indicating such advantages as flexibility, bonded joints and integral goose-neck.

In Rockford, the city installs the service to the property line and the plumber takes it into the house from there. Extra strong (XS or AA) lead pipe is required.

Lead has gone ahead quietly performing its functions as a service pipe material satisfactorily and has simply been accepted without much comment. Although used for centuries, its characteristics are better suited than ever before for service pipes particularly under modern conditions. For instance, more extensive and more expensive pavements require the durability of lead and its extra wall thickness under them. Greater use of electricity has multiplied stray currents in the ground and made it desirable to use a material like lead with less tendency to pick them up and be corroded electrolytically. Added wall thickness again helps. Traffic has become heavier and denser, increasing the value of lead's flexibility in resisting damage caused by it and increasing the necessity for bonded joints like wiped joints that will not shake loose. Excavations are more numerous, resulting in more settlement and movement of the ground, again requiring the flexibility of lead.

Rockford is one of Illinois' most important cities, with a population of more than 85,000. It can not afford to have its busy, costly streets torn up to replace or repair failed services or to have water supplies to its citizens or industries interrupted. The new code provision requiring lead services will go a long way toward protecting against such occurrences.

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