

LEAD INDUSTRIES ASSOCIATION

60 EAST 42ND STREET

NEW YORK 17, N. Y.

April 1, 1960

SUBJECT: LEAD DOME MARKS 25TH
SERVICE-FREE YEAR

To Members of the Lead Industries Association:

We are pleased to attach a reprint of an article entitled LEAD DOME MARKS 25TH SERVICE-FREE YEAR, which appeared in HEATING & AIR CONDITIONING CONTRACTOR, January, 1960, issue.

Additional copies, up to 25, are available and will be supplied free of charge to members upon request. Above this quantity, they can be supplied to members at our cost of \$1.80 per hundred.

The publication of this article was a result of our publicity program and was prepared with the assistance of David Degman, Chief Maintenance Supervisor, New Jersey State Prison Farm, Rahway, N.J.

Distribution of this reprint will be made by L.I.A. to over 14,000 architects, sheet metal workers, and municipal engineers.

Sincerely yours,

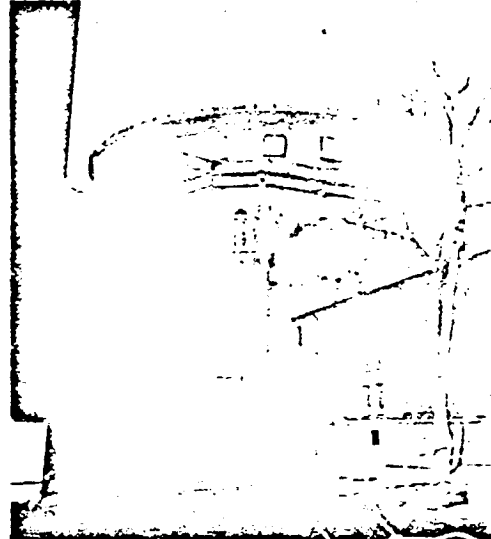

Secretary

LEAD INDUSTRIES ASSOCIATION
NEW YORK 17, N. Y.

AIA No. 12-A-3



BACK IN 1935, the New Jersey State Prison Farm looked like this as the dome was being re-roofed with hard sheet lead. Note scaffolding at right of dome, vintage automobiles parked below.



IN 1959, the characteristic lead patina is evident throughout the dome. No discoloration from rainwater runoff has occurred at either the dome's base or on the building's sides.

LEAD DOME

MARKS 25TH SERVICE-FREE YEAR

By David Degnan
Chief Maintenance Supervisor
New Jersey State Prison Farm
Rahway, N. J.

Virtually no maintenance has been required on the lead-covered dome of this prison building. Despite hurricanes, a highly corrosive atmosphere, and the passing of 25 years, the hard lead roof looks as good as new.

ONE OF THE LARGEST lead-covered domes in the world is now entering its 25th year of trouble-free service. The huge structure, which measures more than 100 ft across at the base, is located atop the main building at the New Jersey State Prison Farm in Rah-

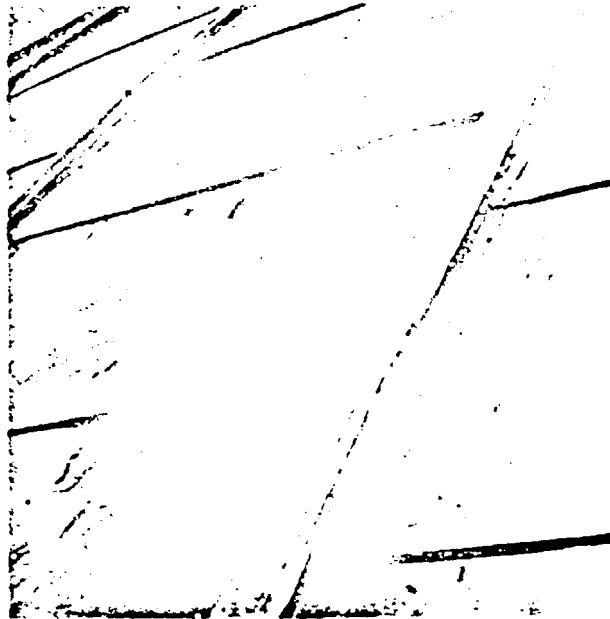
way. Since the present lead sheathing was applied in 1935, virtually no attention has been required other than an annual inspection.

The existing roof was installed after the original copper covering (applied when the building went up in 1901) failed. Severe dis-

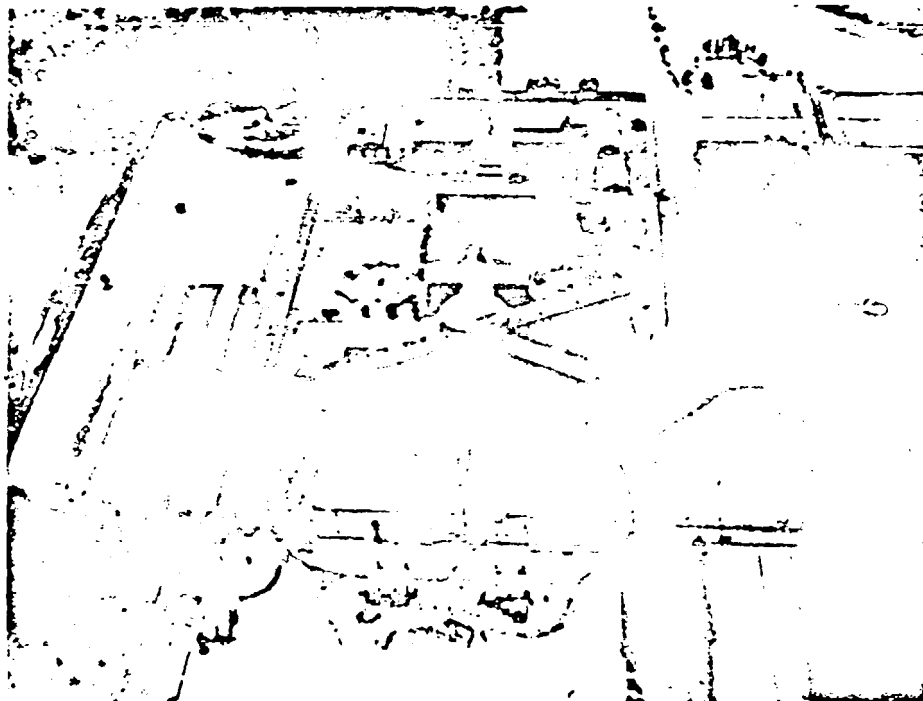
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DETAILS OF ROOF construction are shown in this close-up. Sheets are loose-locked to battens and each other without the use of solder. When the roof was installed, all joints were filled with a non-hardening mastic.



SIZE OF DOME can be gauged from this aerial photo. Though the immediate surroundings are rural, numerous refineries, smelters, and factories are located in the area. Corrosive fumes from these plants caused the original copper covering to fail.



coloration and numerous leaks developed in the old copper roof as the result of the highly corrosive atmosphere around Rahway, where numerous refineries, smelters, and industrial plants are located. Because of this corrosion problem, lead was selected as the re-roofing material.

Construction Details

The present roof is batten-seam throughout. Battens are spaced about 4 ft apart at the base and are fastened to the deck by means of toggle bolts. Cross sections measure roughly 2 x 2 in., with upper corners rounded and a slight taper at the base. Before installation, the battens were impregnated with creosote.

When the lead sheathing was applied, an underlay of 30-lb as-

phalt felt and 15-lb deadening felt was first put in place. The basic roofing material was 3-lb hard lead, alloyed with 7.5 per cent antimony for greater strength. Most of the sheets used in the installation measured 2 x 4 ft before trimming.

No solder was used on the roof. Instead, the sheets were loose-locked to each other and to the batten caps. Copper cleats, fastened to the deck and battens, were used as a preferred alternative to driving nails through the sheet lead. All joints were filled with a non-hardening mastic. This general application method provided amply for expansion and contraction, and is undoubtedly one factor in the roof's long trouble-free life.

The installation was made by

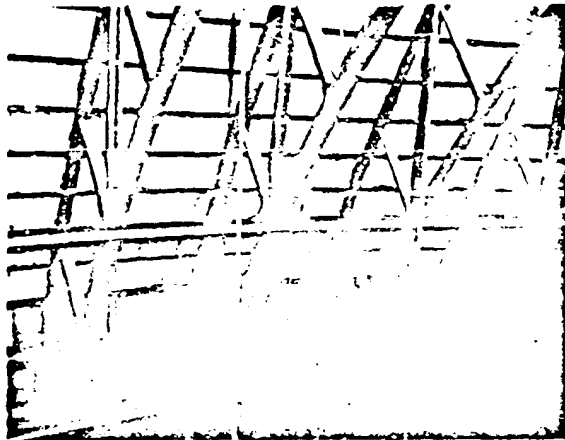
Edwin R. Huddy & Sons, a prominent Trenton, N. J., sheet metal shop specializing in architectural work for institutions. (The Huddy firm is still in existence and still on HAC's circulation rolls.) The lead sheets were trimmed to size in the Huddy shop, then seamed at the job site. The entire job took about two months to complete.

Little Maintenance Needed

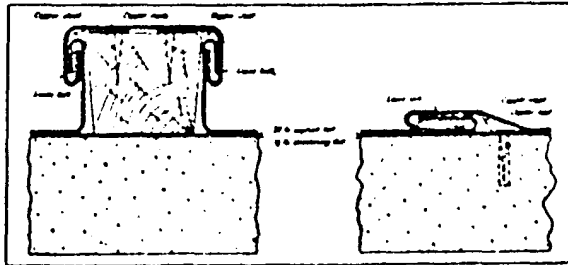
After almost 25 years of service, the lead sheathing on the dome continues in excellent condition. Air pollution in the Rahway area has intensified greatly in the last quarter century, but it has had no effect whatever on the dome. The characteristic lead patina is now uniformly evident throughout, and there has been no trace of discoloration either on the dome or at the base as the result of rain-water runoff.

Maintenance-wise, the only repair work needed to date was necessitated by a severe hurricane which passed through Rahway in 1952. But despite pounding by winds of more than 90 mph, only one of the hundreds of loose-locked sheets was worked free from its batten. This insignificant damage was easily repaired after the winds subsided.

Back in 1935 when the present roof was applied, lead was selling for about 4¢ a pound and sheet metal journey men were paid \$1.00 an hour or less. On the basis of these costs, the dome could be torn down today and sold as scrap for more than it cost to erect 25 years ago. Thus, it has quite literally paid for itself. No more could be asked of any roof. ■ ■



DOME INTERIOR, showing structural supporting members. When built, the dome was said to have been the third largest in the world, second largest in the United States.



DETAILS OF ROOF CONSTRUCTION are shown in these sketches. Use of copper cleats did away with the need for driving nails through any portion of lead sheets.

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