

A quarter century of maintenance-free

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SILVER ANNIVERSARY

LEAD INDUSTRIES ASSOCIATION, INC.

292 Madison Avenue • New York 17, N.Y.

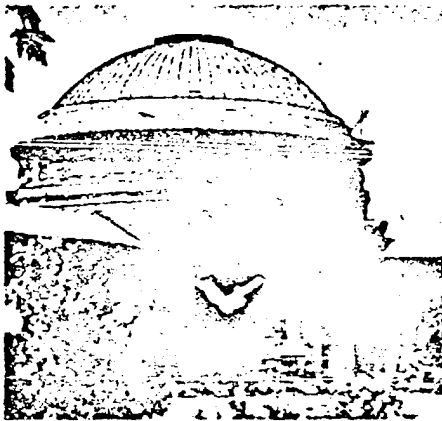


Look Ahead with Lead

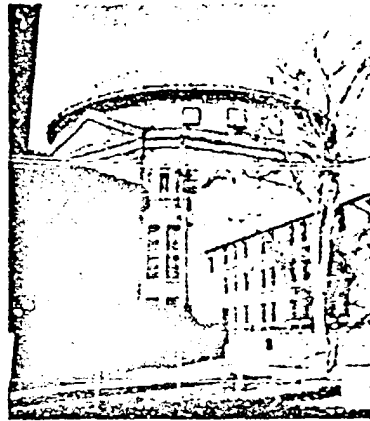
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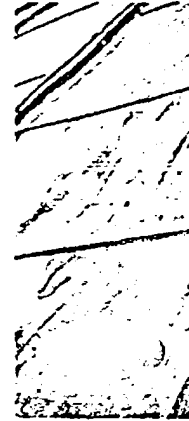
NEW JERSEY STATE PRISON FARM



Back in 1935, the New Jersey State Prison Farm looked like this (left) as the dome was being reroofed with 3-lb hard lead. Note the vintage autos in this picture. Twenty-five years later (right)—the dome has a timeless silvery-gray patina. There is no evidence of discoloration of the stone-



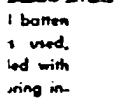
work by rain-water runoff. Total maintenance to the roof was insignificant damage to one sheet, among the hundreds, which worked loose in a hurricane. It was quickly readjusted after the storm. Close-up shows how the loose lock horizontal



seams mate with vertical seams. No solder was since the joints were fit non-hardening mastic d stallation.

As a testing ground embodying the most rugged conditions any roofing material might be called upon to answer, the atmosphere over New Jersey's heavily congested industrial areas is preeminent. Acid forming wastes from a thousand refineries, smelters, and factory chimneys present a constant hazard.

Almost in the midst of this territory stands one of the largest lead covered domes in the world. Finished in three pound hard lead this roof covers the main building at the New Jersey State Prison Farm in Rahway. The Edwin R. Muddy & Sons Co. of Trenton, N. J. were responsible for the craftsmanship on this job which has withstood the searing heat of summer sun as well as winter's stinging cold since 1935 without any expenditure for maintenance. The pictures here show the dome at its twenty-fifth anniversary with the characteristic lead patina in evidence. Equally important is the fact no discoloration from rain-water runoff has marred the stonework below. The close-up of roof construction shows sheets loose locked to battens and to each other with flat seams staggered on either side of battens.



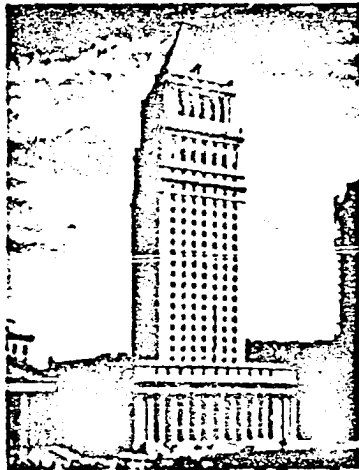
1 batten
is used,
led with
ring in-

Photo and detail drawing show how the batten ends are finished at the eaves. Note the unusual peaked batten design employed.

The view of the lead roofed arcade of the Drink Hall will give an idea of the extent of this installation. The orderliness of the batton pattern blends beautifully with the rhythm of the marching arches beneath. In addition, the non-staining characteristic of the metal guarantees it will remain a perfect foil for the soft reds of the brickwork and the clean accents of limestone quoins and belt courses.

FEDERAL COURT HOUSE,

Foley Square, New York City

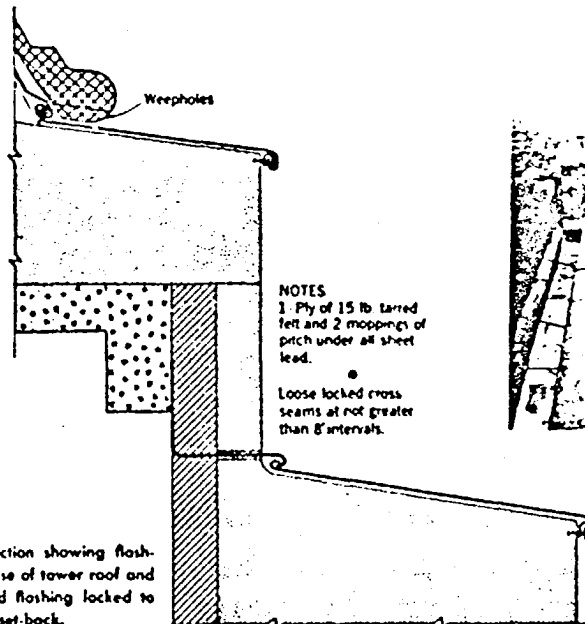


The last building in our quartet is a distinguished member of a growing group of fine buildings dedicated to the Federal Service: the Federal Court House on Foley Square in New York City. Built in 1935 and designed by Cass Gilbert, nearly the full vocabulary for uses of lead in building is found here. Three pound hard lead was used for roofing and flashing, sheet lead was used under floor slabs and in foundations, for waterproof flooring and for shower pans and lead was used in paint, a total running into hundreds of tons. Typical details will show the various uses, methods of joining and fastening.

As has been found true in all cases where installation was carried out properly, the material here answered every demand made upon it. In this case the New York Regional Office of the General Services Administration for the Federal Government reports that no direct maintenance has been charged against lead installations in the building.

New York City's Federal Court House has lead roofing, flashing, and waterproofing.

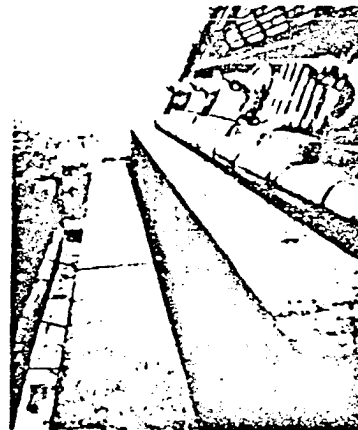
Lead covered setback at base of lead lined tower roof. Lead lined gutter is visible at the left.



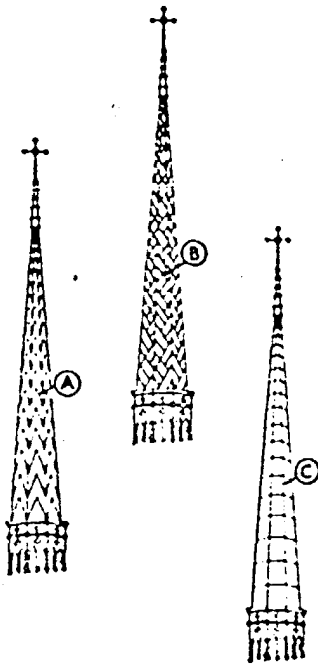
NOTES
1. Ply of 15 lb tarred felt and 2 moppings of pitch under all sheet lead.

Loose locked cross seams at not greater than 8' intervals.

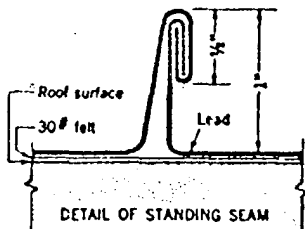
Detail section showing flashing at base of tower roof and concealed flashing locked to lead on set-back.



NOTES AND TECHNIQUES

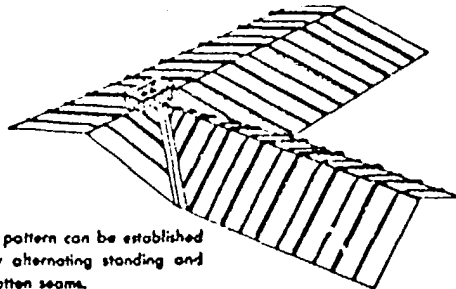


Roof seams offer interesting pattern possibilities. The steeples in A, B, and C illustrate the variety possible in the same basic structure. A further degree of freedom is offered in the choice of seam employed—B, for example, might be done with standing seams or, if greater relief were desired, with batten seams. Good practice would indicate a standing seam for A, a flat seam for C.



There are many reasons for using lead other than those of longer life and lower maintenance charges. Lead roofs provide savings both in material costs and in installation charges which make them highly competitive with all comparable roofing materials. Costs today, per square foot, for a range of metals in the usual roofing gauges find lead about equal to copper and cheaper than other metal roofs except aluminum, terne and galvanized steel. Moreover, since installation techniques are virtually the same for all metals, lead's workability yields an additional premium in labor costs, a significant item in today's market.

Unlike other metals, lead will retain the shape into which it is easily formed. Every joint is an expansion joint with no welding or soldering required. The use of standing seams or batten seams, as illustrated by their use in these four roofs, is not only an utilitarian device for fastening sheets of lead together, it is a means of accomplishing design freedom by using patterns of one or the other or both. Details of the three types of seams and suggestions for their use can be found in the accompanying drawings. Compatibility, a factor in the selection of any roofing material, is not a problem with lead. Lead weathers to a soft, silver grey patina. The resulting color harmony with any masonry will never be destroyed by staining since the corrosion products of lead become a part of the surface minerals and can not wash off.



A pattern can be established by alternating standing and batten seams.

SPECIFICATIONS

SHORT SPECIFICATION

Unless otherwise particularly specified, all sheet metal work shall be ... lb. hard sheet lead, and all material and labor in connection therewith shall be executed in strict conformity with the recommended practice and Standard Specification of the Lead Industries Association, which specification is hereby declared and made a part of this specification, with the same force and effect as if written herein in full.

STANDARD SPECIFICATION

MATERIALS

Unless noted otherwise, all lead shall be hard lead, containing not less than 9% or more than 7.5% of antimony, and the remainder shall be lead.

Sheet lead shall be free from pits, dents, buckles, waves, scratches, grit, foreign matter, porosity, and other injurious defects. All lead shall be 3 lb. hard lead except where herein specified otherwise, and except as follows:

1—Where flashings may be 2 1/2 lb. hard lead. Slop flashing, non-coated hip flashing, closed valley flashing, cap flashing, window and door head and sill flashing, chimney cap flashing, gutter lining where gutters are not over 6" wide, gable and flashing, valum cap and base flashing, base flashing (where no heavy weight roofs are same).

2—Where roofing may be 2 1/2 lb. hard lead. Small standing seam roofs, where seams are not greater than 15" o.c. Batten roofing where battens are spaced not over 18" o.c.

No sheet shall exceed 7'0" x 4'0". (Occasional larger sheets may be permitted.) Flashing sheets shall be not over 3'0" long. Sheets with flat surfaces more than 12" wide without longitudinal bands reinforcing them shall be not over 6'0" in length.

COATING FOR CONTACTS WITH FRESH CEMENT OR CONCRETE.

- Black asphaltum brush coating, as made by
- Layer of 15 lb. asphalt impregnated rag felt

ROOFING FELT.

- Under all lead roofs lay 30 lb. per square building felt, as made by

CLEATS & NAILS.

- Cleats shall be—16 oz. copper (or) 3 lb. hard lead.
- Hard copper wire nails.

SOLDER.

- 50/50 solder for hard lead—Standard Specification of the A.S.T.M. B 32.21.

JOINT & SEAM COMPOUND.

- Vulcanex Z 7700 or Kwikfil non-hardening compound.

LAYING & WORKMANSHIP

EXAMINATION OF SURFACES.

- All defects found in surfaces prepared by other trades to receive lead roofing shall be reported to the Architect in writing. The Architect will cause all defects to be remedied. The commencing of work by the Contractor indicates his acceptance of the surfaces.

TYPES OF ROOFS.

- Roofs shall be—standing seam (or) batten (ribbed)—spaced " o.c. (preferably 18").
- Battens, as set by others, shall be " wide at top, tapered to " wide at the bottom, and " high at center, with the top edges slightly rounded.
- Finished standing seam shall be " high when completed (not less than 1").

LEAD PROTECTION.

- Use care in handling this material so as to prevent scarring, bruising, or sharp bends.
- Paint all lead work which is to come in contact with fresh cement or concrete work with one heavy coat of asphaltum or felt on side which is to make the contact.

SEAMS & JOINTS.

- Seams shall be joined by loose locks or overlaps made in the direction of flow, which shall be filled with non-hardening compound where there is possibility of water, snow, or ice ponding or driving into the joints. Where bonds in sheets cross the seams, the sheets shall not be notched to facilitate seaming.

1—Flat lock seams shall finish at least 1" wide.

2—Lap seams shall lap at least 3" on vertical surfaces or built-in flashings or 4" elsewhere.

3—Standing seams shall finish at least 1" high unless otherwise specified. Soldered seams shall only be used for inserting gasket pieces, making special caps, and for other special conditions, and in no case shall be used to join roofing or flashing sheets to make continuous runs of roofing or flashing greater than 4'0", and 8'0", respectively.

CLEATS.

- Cleats shall be 16 oz. copper, except that if any part is exposed, 3 lb. hard lead shall be used. Cleats, except where otherwise specified, shall be at least 2" wide and 4" long, secured by two nails. Continuous cleats shall be in lengths not exceeding 8'0" and a space of least 1/2" wide shall be left between sections. They shall be nailed at least every 8". All cleats shall have sufficient metal on the nailed end to trim back over the nail heads to protect the lead lying over the nails.

FASTENING.

- Cleats shall be used to secure sheet lead to supporting surfaces in such manner as to permit free expansion and contraction of the lead. Nails or screws shall never be driven through sheet lead unless particularly specified, except that pieces of lead not larger than 18" square may be nailed along one edge only if nail heads are covered.

BENDS.

- All bends shall be made with an easy radius. Where metal turns up on a wall curve, or batten, or other surface, provide a clearance between bend in metal and such surface of at least 1/4" for expansion.

VERTICAL SURFACES.

- Sheeting for vertical surfaces shall be installed by the standing seam method (or) flat seam method. At the bottom it shall be loose locked to base flashing and at the top to through wall flashing or lead coping.

1—Standing seams shall run vertically. Sheets shall be not more than 5'0" wide, with this dimension horizontal. They shall not exceed 4'0" in height and, if the wall is higher than this, the sheeting shall be installed in more than one sheet vertically, with loose locks between sheets. Continuous cleats broken only at standing seams shall support the sheeting of these horizontal joints. Cleats 2" wide shall be folded into the standing seams at 12" intervals.

2—Flat seam sheeting shall be installed in sheets not exceeding 4'0" long and 18" high, with long dimension horizontal. It shall be supported by continuous cleats, broken only at vertical seams, in all horizontal seams. One 3" wide cleat shall also be folded into the lock at the end of each sheet.

FLASHING.

- Where flashing is built into a wall and emerges more than 3" into the open, it shall be loose locked where it emerges to a separate piece.
- Flashing coiled into a rosette shall have separate flashing piece loose locked to the rosette piece.

ARCHITECTURAL DEPARTMENT
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