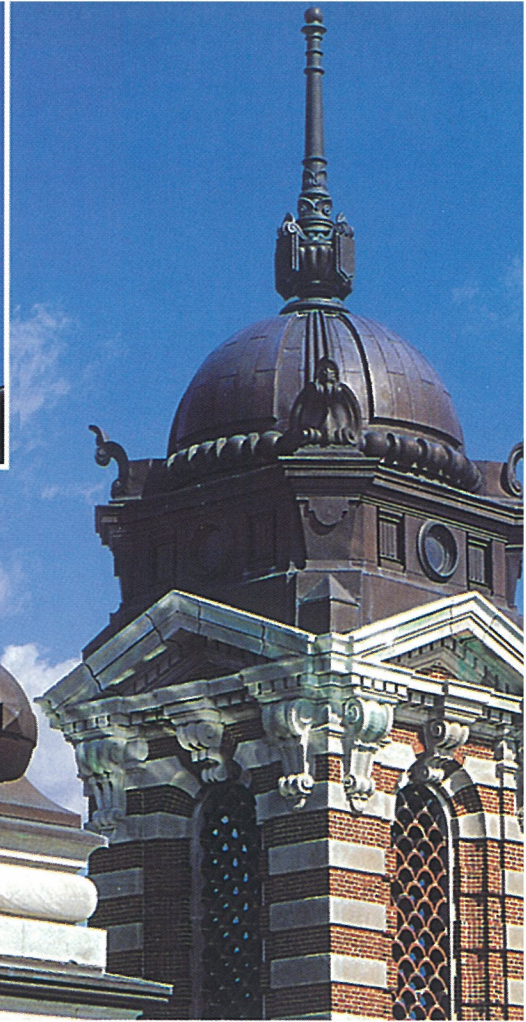
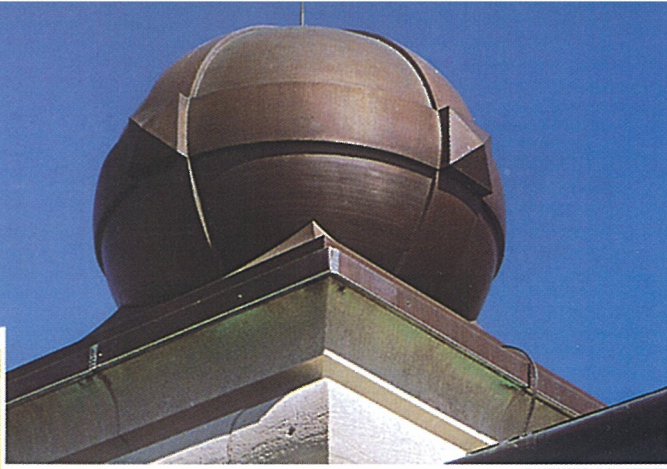




COPPER DESIGN

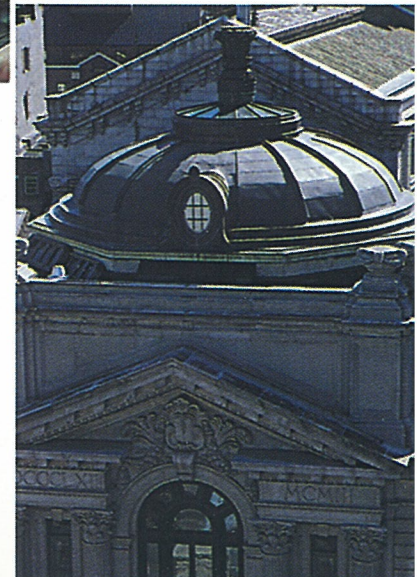
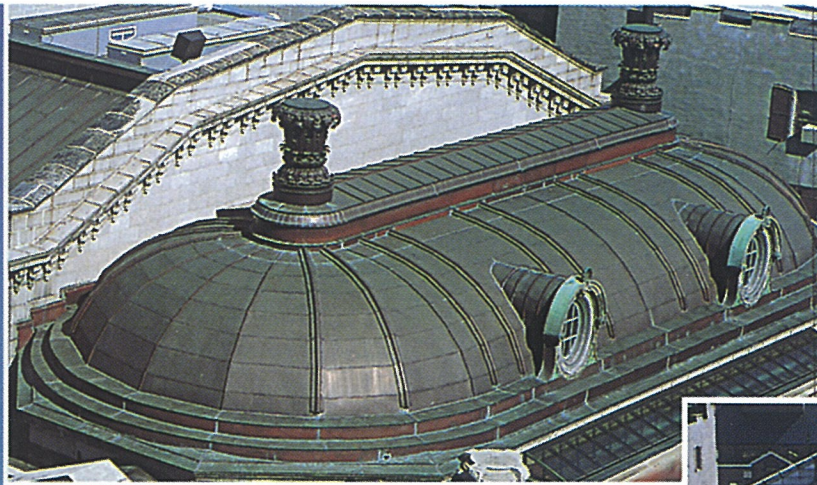
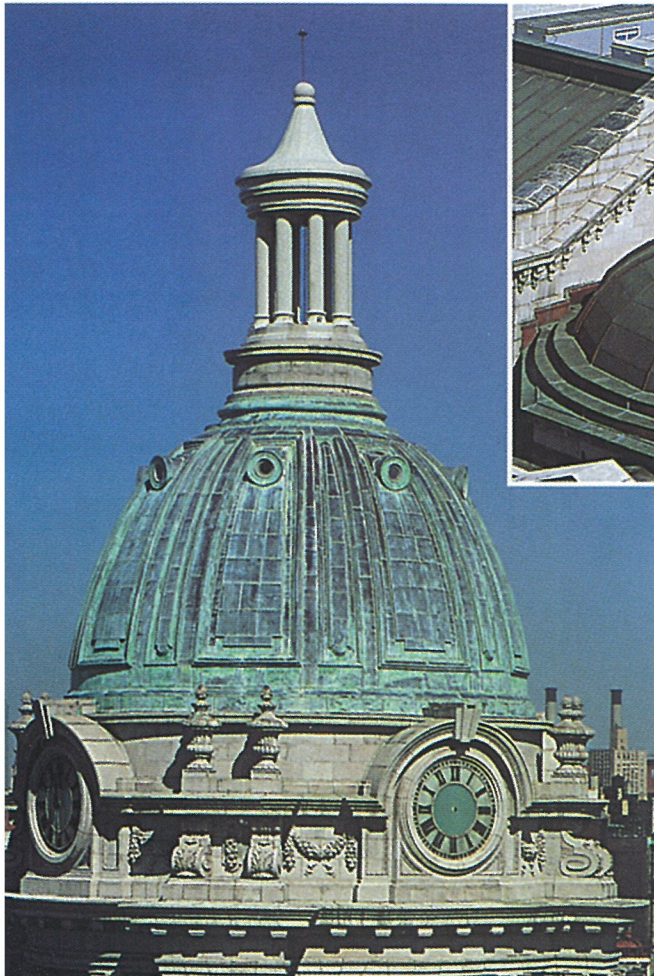


Roofing
Facades
Detailing
Restoration



Ellis Island

- Globe ▲
- Dome and Globe ►
- Dome Prototype ◄



The Police Building

- South Dome ▲
- North Dome ►
- Center Dome ◄

ELLIS ISLAND (1898) National Immigration Center Main Building, Statue of Liberty Park

THE POLICE BUILDING (1909) 55-Unit Residential Cooperative, New York City

Architects: *Ellis Island*

Beyer Blinder Belle Architects & Planners, New York
 Notter-Finegold & Alexander, Boston

Contractors:

P.A. Fiebigler, Inc., New Rochelle, NY
 L.P. Kent Corporation, Bronx, NY
 A. Munder & Son (New York Roofing), Long Island City, NY
 Simpson Metal Industries Inc., College Point, NY
 Kosempel Co., Philadelphia

Client:

U.S. National Park Service, Denver Service Center
 Peter F. Dessauer, Historical Architect Ornamental Copper

Architects: *The Police Building*

Ehrenkrantz, Eckstut & Whitelaw, New York

Contractors:

L.M.C. Corporation, Paterson, NJ
 Schtiller & Plevy, Newark, NJ

Client:

Fourth Jeffersonian Corporation

SIGNIFICANT COPPER DESIGN DECISIONS

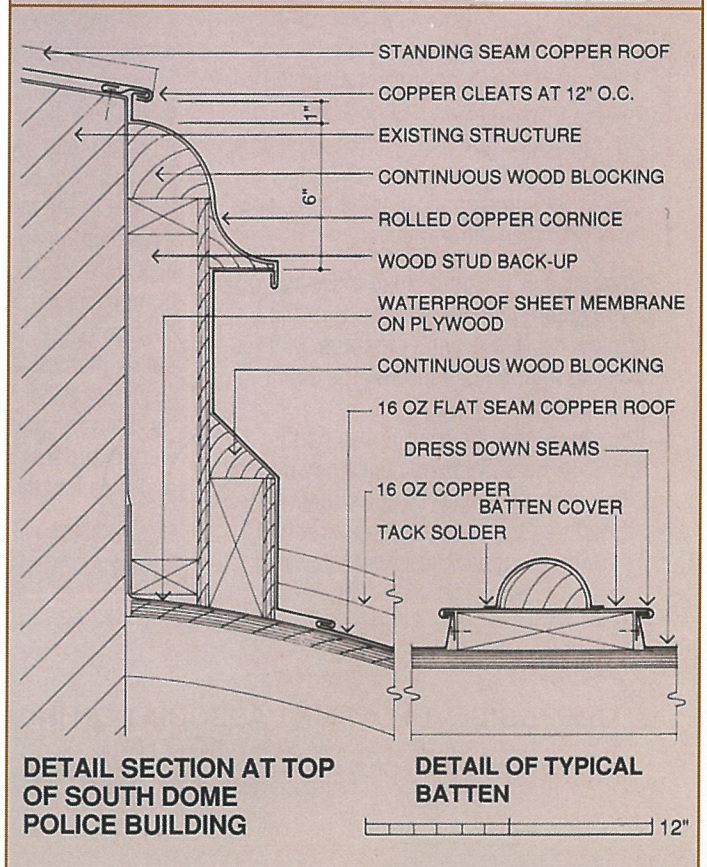
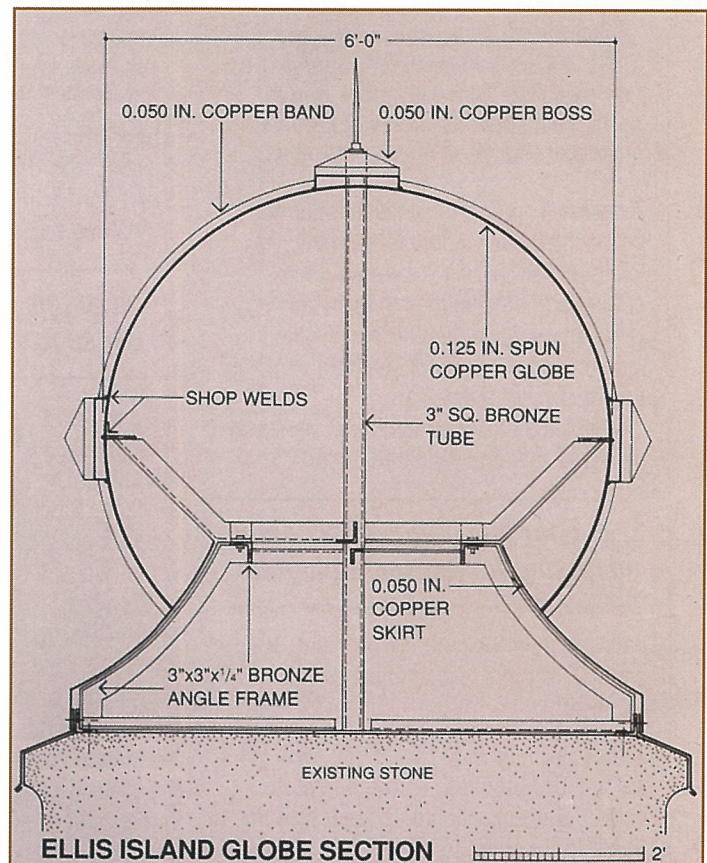
Preservation projects incorporating copper benefit from the noble metal's unique qualities that insure longevity, aesthetic appeal and bottom-line economy for restoration, renovation and replacement.

The characteristic green patina of aged copper represents classic beauty in architecture. That same patina provides centuries-long corrosion resistance. Copper has the form and function to fit in all the right places — old and new.

Preservation architects face special problems of fidelity. At one extreme are those who contend that you should only patch existing material, add new only if necessary, and use only the original installation techniques. At the other extreme, only the "spirit" of the original must be kept intact. Therefore, you can replace all material, modify design and use new fabrication and installation technologies. An appropriate solution for any given project takes into account aesthetic, historic and economic considerations. Copper's unique qualities provide a wide spectrum of options from spot repair to total replacement, from doing it the old way to using new technologies.

The Main Building of Ellis Island and The Police Building in New York City exemplify how copper can be used to correct existing problems and preclude future problems, while maintaining and reinforcing the original architectural statement.

DETAIL DRAWINGS



ELLIS ISLAND AND THE POLICE BUILDING: THE ARCHITECTS' THINKING

The following is taken from interviews with James W. Rhodes, FAIA, of Beyer Blinder Belle (Ellis Island) and Denis Glen Kuhn, AIA, of Ehrenkrantz, Eckstut & Whitelaw (The Police Building), during which each spoke about his project and the use of copper on historic buildings.

Rhodes: Through the ages, copper has been consistently adaptable to new technologies. At Ellis Island we used cutting edge techniques to form and install copper, yielding far more sound results than the original...without violating the integrity of the design.

We used heavier gauge metal, achieved tighter seams and rendered better

...copper has been consistently adaptable to new technologies.

detailing than the craftsmen of the 19th century. Yet, the visual impression is identical.

Kuhn: Because the Police Building is an historic landmark, restoration of its copper was essential to its preservation. The owners opted to restore and replace copper even on the low-pitched roofs seen only from nearby rooftops.

We used specialists for repair of the center dome and regular sheet metal contractors for the rest. There's no magic or extra labor expense to work with copper. In some applications it's easier to work with than other metals.

Rhodes: For historical restoration, you try to understand the intentions of the original designers and craftsmen. But you don't have to be confined by the limitations they faced.

For example, the four globes on the inside corners of the building were initially fabricated out of light-gauge copper sheet applied to a frame in numerous sections. To overcome the water penetration that

had occurred, we designed a new approach to the geometry. We had the hemispheres of each globe seamlessly spun out of 1/8-inch-thick copper and joined them at the equators. The globes are faithful to the originals, but the fabrication was radically different and superior thanks to today's technology.

Kuhn: The center dome of the Police Building was one-third gone. Like two sister domes, its copper had been vandalized for scrap value. Our options

...no magic or extra labor expense to work with copper.

were to replace the entire dome or the missing section only. Because of copper's durability, the existing two-thirds were perfectly functional. So we opted to patch-in new copper. We even replicated the embossed design of the original.

We were faced with the problem of what's the most faithful preservation: let the bright new copper stand out as new and different, or make it match the old? CDA helped by providing recipes for accelerated patinating techniques. We were able to blend-in the repaired and replaced sections with the rest of the 90-year old dome.

We chose not to replace the two other domes as originally designed. We fabricated batten and flat-seam sections over a redesigned framework with greater strength than the original...at lower cost. Although not authentic, the domes are faithful to the building's overall design. To avoid confusing restored with renovated elements, we left the copper on these domes in a natural state to patinate in its own time. [Ed. Note: In New York City a patina matures in about 15 years.]

Three copper urn finials were fabricated for the north and south domes. These were made from original drawings...the real urns have long since vanished.

Rhodes: We wanted to approach the fabrication of the four tower domes

differently than the first designers. We wanted thicker gauges and approaches to the geometries that would be less subject to weather and structural instability. CDA showed us better solders, cleats, copper pop rivets, folded locked seams and expansion joints unknown or unused by the early craftsmen.

To be faithful to the original, we needed to verify sizes, connections and patterns, as well as the joining of glue-laminated frames, plywood and copper. Rather than do this on a scaffold 135 feet in the air, we built a full-scale prototype on the ground. The expense of the prototype was more than justified when actual installation of the domes on the towers went from start to finish without changes or delays.

Kuhn: I enjoy working with copper; it's authentic and flexible. Besides its

Besides its natural warmth and beauty, copper is practical.

natural warmth and beauty, copper is practical. It's durable, and it does the job right.

Rhodes: Copper is classic. Today's technology for working with copper is better than ever before. Copper's future is as bright as its past.

Copper Development Association Inc. and Canadian Copper & Brass Development Association provide information and technical assistance to architects, contractors and builders considering the use of copper and copper products in projects of any scale. This publication has been prepared for the use of such professionals and compiled from information sources CDA and CCBDA believe to be competent. However, recognizing that each installation must be designed and installed to meet the specific requirements of the application, CDA and CCBDA assume no responsibility or liability of any kind in connection with this publication or its use by any person or organization and make no representations or warranties of any kind hereby.

This publication is available through CDA and CCBDA along with many other publications covering a wide range of copper-related subjects.



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