The Nebraska Capitol Exterior Masonry Project
1998-2010

A 1998 investigation of the entire exterior face of the Capitol revealed the weatherproof surfaces of the building were failing. The Indiana Limestone façade had deteriorated as a result of the extreme temperature fluctuations in Nebraska's climate and a problem with the original 1920's expansion joint construction had become apparent. The annual freeze thaw cycle associated with this region had cracked miles of mortar joints and allowed moisture to penetrate the walls. This moisture caused the clay brick behind the limestone to expand and shift the stone out of alignment, especially at the entrances, parapet walls and observation decks. As well, it was discovered that the original expansion joint at each floor level was not adequate; this resulted in excessive compression stress fractures in the tower's stone facade. A survey of the 2.5 acre copper roof revealed it had been installed using methods less effective than those available today resulting in chronic interior leaks. The project consulting architects and engineers developed a five-phase restoration plan which addressed these problems in the Capitol's exterior face, with all work completed in 2010.

Phase I -- Restoration of the North Entrance
Phase II -- Restoration of the Gold dome and Drum
Phase III -- Restoration of the Tower and Turrets
Phase IV -- Roof Replacement
Phase V -- Restoration of the Base

Restoration Team:
Office of the Capitol Commission
Bahr, Vermeer & Haecker Architects, Inc. *Lincoln*
Wiss, Janney, Elstner Associates, Inc. *Chicago*
General Contractor:
Mark 1 Waterproofing & Restoration Company *Dolton, Ill.*
Subcontractors:
Midland Engineering *South Bend, Ind.*
Western Falsework Engineering, Inc. *Denver*
Safway Scaffolding *Denver*

Inspection of the gold tile dome and tile Thunderbird mosaics revealed they were in good condition. Restoration involved cleaning with soapy water and adding grout where necessary. The limestone exterior was cleaned using a biocide followed by a low pressure air abrasive process.

The turrets and observation deck walls at the top of the Capitol were disassembled and restored in the same manner as the entrances, red bricks were removed, concrete brick installed and waterproofing added.

Relieving stresses in the tower required the removal of limestone veneer at each floor level. Contractors then removed the brick backing to reveal the tower's structural steel frame. Shelf supports were attached to the floor beams and the limestone veneer reapplied to rest on the supports. The added shelves transfer the weight of the limestone onto the steel frame, reducing stress on the façade and preventing further damage to the limestone.

Restoration of all four entrances required removing and storing the limestone façade and granite stair treads, then demolition of the red clay brick core down to the foundation. The interior core was rebuilt using poured concrete and concrete bricks which better resist movement during freeze/thaw cycles. Added metal flashing and integrated weep holes channel water away from the interior increasing long term stability.

Tuck pointing is an important component of keeping the Capitol facade water tight. Contractors ground out all existing mortar and pointed over 30 miles of mortar joints.

A new copper batten and flat lock roof system was applied over a waterproof membrane and insulation. Insulation was added where none existed originally. Replacing flat lock panels with a batten system decreases the number of seams reducing the potential for leaks. Wall flashing was extended to reduce ice dams causing leaks.