



20th-Century Building Materials and Suitable Substitutes: Exterior Materials

Project # 15-707

Background:

The Department of Defense (DoD) owns or manages over 340,000 buildings, of which approximately 140,000 are 50 years of age or older; the majority of these buildings were constructed during the twentieth century. Wartime construction efforts associated with World War II dramatically shaped the environment at many DoD installations. Within the last 20 years, many of these often hastily constructed buildings have been determined eligible for listing in the National Register of Historic Places, and other mid-century buildings are reaching the 50-year age threshold. Throughout the DoD, these twentieth-century buildings are reaching a critical point in their lifespans as materials utilized in their construction reach the end of their serviceable lives, and true replacement in-kind may not be an option due to various factors. These constraints require a creative approach to determine sensitive replacement options. In recent years, the Mid-Atlantic Region of the Navy has first-hand experience dealing with this issue at multiple installations, as it relates to the replacement of deteriorated twentieth-century building materials.

Objective:

The objective of this project is to provide a useful tool that will assist DoD Cultural Resource Managers (CRMs), facility planners, architects, and engineers responsible for the maintenance and repair of historic twentieth-century buildings in complying with Section 106 of the National Historic Preservation Act.

Summary of Approach:

The approach to the project was an extension of the previous methodology of the FY13 Legacy Project *20th-Century Building Materials and Suitable Substitutes: Windows* (Legacy Project 13-707), in which a CRM survey questionnaire, on-site research, and installation visits identified exterior materials as problematic. The next step was a review of National Park Service briefs and other documentation regarding the rehabilitation or replacement of twentieth-century building materials. On-site investigations were completed at various DoD installations, and the corresponding SHPOs were contacted for further information. The methodology took into account lessons learned from the previous project, which guided the organization of this report.

Benefit:

This project will help expedite Section 106 compliance. The report provides a protocol that explains the factors

that should be considered in determining the maintenance, repair, or replacement of historic exterior materials. This report provides a summary of evaluating repair versus replacement options for historic exterior materials consisting of concrete, corrugated metal, and asbestos-cement. When replacement is warranted, this report identifies acceptable substitute materials that meet the Secretary of Interior's Standards for the Treatment of Historic Properties, as well as minimization measures that are acceptable to respective State Historic Preservation Offices (SHPOs), thereby avoiding or minimizing adverse effects to historic properties and ultimately preserving their historic integrities while enhancing future sustainability. By balancing preservation concerns with federal regulations and program needs, the DoD can continue to ensure the long-term viability of the thousands of historic twentieth-century buildings within its inventory.

Accomplishments:

The project evaluated the feasibility of in-kind replacement, as well as identified suitable substitute materials when applicable. While keeping historic materials in place is the ideal scenario, the feasibility varies between the study materials. Concrete can be repaired and replaced in-kind, as concrete remains readily available and customizable. The repair or replacement materials should match the color, aggregate, and composition of the historic concrete when possible. A qualified contractor with demonstrated experience in treatment of historic concrete should be used. No suitable substitutes were identified. Corrugated metal can be replaced in-kind, as it remains available and customizable, though compatible metals should be used. The historic design and appearance should be maintained through color and corrugation rhythm. Asbestos-cement cannot be replaced in-kind, as it is no longer produced in the United States. Asbestos-cement may be replaced with either fiber-cement products or corrugated metal to avoid adverse effects. The report also provides a list of manufacturers that can assist with supplying historically sensitive materials. In addition, the report presents the history of these three particular exterior materials that can be used toward the preparation of mitigation documentation.

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