PROGRAM COMMENT FOR THE PRESERVATION OF PRE-1919 HISTORIC ARMY HOUSING, ASSOCIATED BUILDINGS AND STRUCTURES, AND LANDSCAPE FEATURES

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1.0. INTRODUCTION

1.1. Summary

The Department of the Army (Army) is a large, complex Federal agency with a national defense mission to provide combat-ready military forces to deter war and protect the security of the United States. The Army's real property is a vital component of its national defense mission. As the largest military department in the Department of Defense (DoD), the Army manages the largest portfolio of historic buildings in the DoD and among all federal agencies.

Many of the buildings constructed by the Army over its 248-year history are now historic properties. Among Army historic properties, historic housing is a significant concern; it is a large part of the Army's total housing inventory, it is critical to the readiness mission and well-being of thousands of Soldiers and their families, and it requires substantial financial resources and process time for compliance with the National Historic Preservation Act (NHPA). The Army also has a unique and significant challenge among federal agencies in managing NHPA Section 106 compliance for its inventory of historic housing. The Army owns, operates, and manages the largest inventory of historic housing in the federal government with over 30,000 historic homes currently over 50 years old and subject to NHPA Section 106 requirements.[1]

The Army's 867 pre-1919 homes are located on 19 installations in 13 states and the District of Columbia.[2] The Army constructed its pre-1919 housing following standardized plans developed by the Army Quartermaster Corps. The Army's pre-1919 homes have been continuously occupied by Army families for 100 to 200 years, and 74% (638) of these homes are contributing properties in designated National Historic Landmark (NHL) districts. The Army's pre-1919 homes are actively used military assets with restricted access and are in general not open to the public.

The management of the vast majority of pre-1919 Army homes was privatized at Army installations between 15 and 20 years ago. NHPA compliance activities on installations with privatized housing have occurred following NHPA Section 106 Programmatic Agreements (PA) executed between each installation and their respective State Historic Preservation Office (SHPO) at the time of privatization. The installation specific privatized housing PAs require project-by-project SHPO review and application of the *Secretary of the Interior's Standards for the Treatment of Historic Properties* at 36 CFR 68 *(Secretary's Standards)* for the repair and improvement of historic housing.

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[1] Additional information on historic Army housing in general is on the *Army Historic Preservation and Cultural Resources Management* website at https://www.denix.osd.mil/army-cr/.
[2] Specific information on pre-1919 Army housing is at https://www.denix.osd.mil/army-pre1919-pchh/.

In 2019, the Army Inspector General[3] conducted an Army-wide review of privatized housing operations including a review of NHPA compliance for historic homes under the installation-level privatized housing PAs and the *Secretary's Standards*. The Army Inspector General found that the NHPA consultation process with SHPOs under the privatized housing PAs is highly procedural and time-consuming, creates a misperception that the SHPO has approval authority over renovations, historic homes are more costly to operate and maintain, are less energy efficient and require special materials and specially trained craftsmen, and health and safety concerns are present such as lead-based paint and asbestos. The Army Inspector General also found that historic homes are very costly to renovate due to strict rules about the craftsmanship and types of materials that can be used such as custom windows and custom roofing that complicate repair and renovation projects and increase costs and the time to complete the work. The Army Inspector General also found that the rules and restrictions are variable both by individual home and by installation.

The installation-level privatized housing PAs and the *Secretary's Standards* as implemented by SHPOs and installations over the past 15 to 20 years have required the extensive use of high-cost *historic building materials, in-kind building materials* and specialized craftsmen for repairs and improvements. Implementation of those PAs has occurred without adequate consideration of the impact those high-cost materials have on the long-term ability to maintain and improve historic Army housing. Privatized housing PAs as they have been implemented over the past 15 to 20 years using high-cost *historic building materials*, *in-kind building materials*, and specialized craftsmen has led to the inability to fully implement scopes of work to maintain, repair, and improve pre-1919 housing.[4] The inability to fully implement scopes of work has contributed to a costly backlog of deferred maintenance, repairs, and improvements, which has led some pre-1919 NHL homes to be entirely vacated, others to be considered for demolition,[5] and other pre-1919 homes to be mandated by Congress for demolition.[6] Quality of life, health, and safety issues remain prevalent in pre-1919 Army housing. These issues include obsolete electrical, plumbing, and HVAC systems, structural issues, asbestos and lead-based paint hazards, restrictive and outdated floorplans, and a backlog of deferred maintenance, repairs, and improvements.

The Army Inspector General recommended that the Assistant Secretary of the Army for Installations, Energy and Environment (ASA IE&E) evaluate the feasibility of continuing the installation specific PAs for historic housing. That evaluation led to consideration of the programmatic alternatives available in 36 CFR 800.14. The Army determined that a standardized nation-wide programmatic approach was the best course of action to ensure more consistent, efficient, and effective approach to NHPA compliance, rather than to continue to operate under

[3] Department of the Army Inspector General Special Interest Item Assessment of the Residential Communities Initiative (RCI). ID Report 1903, 2019, at https://www.denix.osd.mil/army-pre1919-pchh/.
[4] See *Supplemental Information Briefing* at https://www.denix.osd.mil/army-pre1919-pchh/.
[5] The Kansas City Star. "89 historic Fort Leavenworth homes recommended for demolition" Eric Alder, 20 December 2023.
[6] National Defense Authorization Act 2023, Section 2104, *Demolition of District of Columbia Fort McNair Quarters 4, 13, and 15*.

the installation specific PAs. This approach was defined in the ASA IE&E's *Strategic Agenda for National Historic Preservation Act Improvement*[7] issued in July 2019.

Installation-level privatized housing PAs and the *Secretary's Standards* have been implement by installations and SHPOs over the past 15 to 20 years without a systematic approach and methodology for the selection of building materials. Also, adequate attention has not been paid by installations and SHPOs to the requirement that the *Secretary's Standards* must be applied in consideration of the economic and technical feasibility of each project.[8] Further, the installation-level privatized housing PAs do not have any standardize process and procedures for consideration of the full range of available and appropriate building materials including alternative and less costly *substitute building materials* as provided for under the *Secretary's Standards for Rehabilitation* (36 CFR 68.3(b)). Nor do the privatized housing PAs include detailed design guidelines and a catalog of applicable building materials for pre-1919 homes. Additionally, the lengthy project-by-project consultations between installations and SHPOs required by installation-level PAs cause delays in occupancy of the housing, resulting in negative impacts to military families. This *Program Comment for Preservation of Pre-1919 Historic Army Housing, Associated Buildings and Structures, and Landscape Features* (program comment) directly addresses and remedies these issues.

This program comment is the Army's nationwide programmatic NHPA compliance solution to longstanding pre-1919 housing issues. It is responsive to the Army Inspector General's findings and recommendation, ensures that the economic and technical feasibility of each project is assessed as required by the *Secretary's Standards*, makes certain that the full range of building materials are considered through a systematic approach and standardized methodology that will help reduce the backlog of deferred maintenance, repairs, and improvements. Detailed design guidelines, and an extensive building materials guideline and catalog are incorporated into this program comment to support the building materials selection process. Qualified preservation professionals guide implementation, and the approach will improve process time and address the delays in occupancy of the housing by military families.

This program comment in its entirety minimizes harm and manages pre-1919 NHL housing to a higher standard of care than has occurred under installation level PAs over the past 15 to 20 years. This program comment is consistent with and implements the *Secretary's Standards for Rehabilitation*, and its effect on the Army's inventory of pre-1919 housing is *not adverse*. This program comment demonstrates that the *Secretary's Standards for Rehabilitation* when applied as intended have the flexibility to address quality of life, health, safety, climate resiliency, energy efficiency and other issues in a cost-effective manner. This program comment also reflects a shift occurring among historic preservation professionals to a more humanistic

[7] *Strategic Agenda for National Historic Preservation Act Improvement* letter provided to the Advisory Council on Historic Preservation is posted at https://www.denix.osd.mil/army-pre1919-pchh/.
[8] Secretary of the Interior's Standards for Treatment of Historic Properties, 36 CFR 68.3.

approach to historic preservation that prioritizes the needs of people living in and managing historic homes equally with preservation of the material integrity of the homes.[9]

1.2. Justification

NHPA Section 106 requires Federal agencies to take into account the effects of projects they carry out, license, or assist (i.e., undertakings) on historic properties, and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. The ACHP has issued regulations codified under 36 CFR 800 that set forth the process through which Federal agencies comply with the requirements of NHPA Section 106.

Under 36 CFR 800.14(e), federal agencies can request the ACHP provide program comments on a category of undertakings, in lieu of conducting individual reviews of those undertakings under 36 CFR 800.4 - 800.7. An agency can meet its NHPA Section 106 responsibilities regarding the effects of a category of undertakings on historic properties by following an ACHP-approved program comment.

ACHP's program comment guidance[10] states the primary benefit of program comments is they allow a federal agency to comply with Section 106 of the NHPA in a tailored, consistent way for a class of undertakings rather than addressing each undertaking individually. This is especially useful for the Army considering the magnitude of its historic housing inventory and the many thousands of similar repetitive undertakings occurring to repair, maintain, and improve this large housing inventory. This program comment provides the Army with an alternative means to comply with NHPA Section 106 regarding the category of undertakings termed *management actions* for its inventory of pre-1919 housing, associated buildings and structures, and landscape features (pre-1919 housing).

The need for this program comment is driven by the Army's obligation to provide safe, healthy, quality housing to Soldiers and their families, and the unique challenges the Army has in managing NHPA Section 106 compliance for its large inventory of historic housing. In 2019, the Secretary of the Army declared an *Army Housing Crisis* due primarily to the widespread deficiencies and significant quality of life, health, and safety issues affecting military families living in historic Army housing. These issues led to the Army Inspector General's investigation and continue to receive a high level of attention from Congress, senior military officials, and military family members residing in historic Army homes.

To meet its obligations to military families, the Army must implement specific *management actions* to improve pre-1919 housing conditions. The Army must improve the quality of life of Soldiers and their families, address the health and safety risks from certain hazardous materials found in historic housing, ensure cost efficient, effective, and consistent

[9] *The Relevancy Guidebook: How We Can Transform the Future of Preservation*. Bonnie McDonald. Landmarks Illinois, November 2023.
[10] ACHP Program Comment Guidance https://www.achp.gov/program comment questions and answers.

management of the inventory, and use climate resilient and energy efficient building materials. The Army must also improve the NHPA Section 106 compliance processes time for projects that improve and preserve pre-1919 housing in order to reduce impacts to military families waiting to occupy the housing.

Housing and associated material living conditions are critical factors for military families in the context of the challenges and stressors Soldiers and their families must cope with in their daily lives. The Government Accountability Office[11] found that a direct connection exists between poor housing conditions and military readiness. Concerns among service members about poor housing conditions have been found to make it difficult to focus on the military mission, some service members are leaving the military because of poor housing conditions, and the issue is also impacting the ability to recruit new service members.

For pre-1919 housing, the Army must abate the historic building materials used in housing from this period that present lead-based paint, asbestos, and other hazards to housing occupants; implement improvements and additions that address the need for modernization of living spaces; provide kitchen and bathroom improvements; implement climate change adaptations through the use of climate resilient and energy efficient building materials; implement other energy efficiency measures; modernize heating, cooling and ventilation systems; modernize plumbing and electrical systems; install modern life safety and protective elements such as fire suppression systems and force protection features; and address the project-by-project PA compliance review process that affects the rapid turnaround and occupancy of housing by military families.

The Army also has the need to lease, transfer, or convey pre-1919 housing to facilitate housing operations by its privatized housing partners under the Army's Residential Communities Initiative (RCI). RCI operates under Army authority on Army installations nationwide through legal partnerships between the Army and private sector real property managers. Lease, transfer, and conveyance under this program comment is only for the purposes of transfer of pre-1919 housing to and between RCI partners, and between RCI partners and the Army solely for the purposes of and use as military housing and for associated purposes that support military housing operations.

Addressing NHPA Section 106 compliance requirements for the thousands of repetitive *management actions* occurring on this large inventory of pre-1919 housing presents unique and significant challenges for the Army. According to the *ACHP Program Comment Guidance*, the program comment approach as provided for in 36 CFR 800.14(e) was established to address situations such as this, where a federal agency has repetitive actions occurring within a large inventory of historic properties.

The Army's three prior ACHP-approved program comments for historic housing (Program Comment for Army Inter-War era housing (1919-1940), Program Comment for Army

[11] Government Accountability Office Report 20-281, Military Housing, March 2020.

Capehart-Wherry Housing (1949-1962), and the Program Comment for Army Vietnam War Era housing (1963-1975)) provide the Army the ability to implement *management actions* in a more efficient, consistent, and cost-effective manner.[12] These prior program comments have in turn preserved the historic character of the housing, improved the quality of life, health, and safety of the military families living in historic Army housing, saved millions of dollars in rehabilitation costs, and ensure that historic Army housing will be preserved as a viable and sustainable military real property asset. The Army needs a similar efficient, consistent, and cost-effective means to manage its inventory of pre-1919 homes.

1.3. Coordination and Public Involvement

Issues related to implementation of installation privatized housing PAs were identified by the Army Inspector General, Army housing managers, and Army privatized housing partners.[13] As a result of its investigation, the Army Inspector General recommended that the ASA IE&E assess the feasibility of continuing the installation specific PAs for historic housing. The *Strategic Agenda for National Historic Preservation Act Improvement*[14] issued in July 2019 by the ASA IE&E responded to the Army Inspector General's recommendation. It directs the Army Federal Preservation Officer (FPO) to pursue programmatic Army-wide NHPA compliance solutions, with the ACHP to achieve greater efficiencies in NHPA compliance for historic housing.

To implement the strategic agenda for pre-1919 housing, the Army's leadership began discussions in June 2023 with the ACHP Chair and other key stakeholders. On 15 June 2023, the ASA IE&E held a forum at Fort McNair, Washington, DC with senior leaders in historic preservation to discuss pre-1919 Army housing NHPA compliance issues. Stakeholders present at the 15 June 2023 forum included the Assistant Secretary of Defense for Energy, Installations, and Environment; Assistant Secretary for Fish and Wildlife and Parks, Department of the Interior; Chairman, ACHP; Chairman, National Capital Planning Commission; Associate Director, Cultural Resources, Partnerships, and Science, National Park Service (NPS); Executive Director, ACHP; and the Executive Director, National Conference of State Historic Preservation Officers (NCSHPO). There was general agreement among attendees that a nationwide programmatic NHPA compliance approach to pre-1919 Army housing was needed.

On 20 July 2023, as a follow-up to the Fort McNair meeting, the Army FPO held a consultation meeting with the ACHP Executive Director, NCSHPO Executive Director, and the NPS Associate Director to obtain their views on specific programmatic NHPA compliance approaches for pre-1919 housing. On 24 August 2023, the Army FPO again met with the

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[12] See information at https://www.denix.osd.mil/army-pchh/, https://www.denix.osd.mil/army-vwehh-pc/, and *ACHP Section 106 Success Story: Capehart Wherry Housing Challenge Spurred Innovative Solution* at https://www.achp.gov/success-stories/capehart-wherry-army-housing.
[13] See *Supplemental Information Briefing* at https://www.denix.osd.mil/army-pre1919-pchh/.
[14] *Strategic Agenda for National Historic Preservation Act Improvement*. July 26, 2019. https://www.denix.osd.mil/army-pre1919-pchh/.

representatives from ACHP, NPS, and NCSHPO to further discuss a program alternative for pre-1919 Army housing. Also on 24 August, the Army FPO had a separate follow-on discussion with the ACHP Executive Director. On 19 September 2023, the Army FPO officially notified the ACHP Executive Director of the Army's decision to seek a program comment for its inventory of pre-1919 housing.

On October 23, 2023, the Army published a notice of availability in the Federal Register[15] seeking public comment on its *Program Comment Plan for Preservation of Pre-1919 Historic Army Housing, Associated Buildings and Structures, and Landscape Features*. Also on October 23, 2023, the Army FPO sent a notification to over 800 stakeholders including all SHPOs, all Tribal Historic Preservation Officers, tribal leaders from all Federally recognized tribes, Native Hawaiian Organizations, and non-governmental historic preservation advocacy organizations informing them of the Federal Register notice and the 30-day public comment period on the program comment plan. The Army FPO also invited all of the over 800 stakeholders to participate in the Army's ensuing program comment consultation conferences. During November and December 2023, the Army FPO held a series of six in-depth consultation conferences with all interested parties addressing the scope of the program comment, category of undertakings, likely effects on historic properties, steps to take effects into account, the duration of the program comment, among other relevant topics. The Army prepared an administrative record of all comments on the program comment plan formally submitted by interested parties and provided that administrative record to the ACHP.

2.0. GOAL, OBJECTIVE, AND INTENT OF THE PROGRAM COMMENT

2.1. Goal

The Army's goal for the program comment is to obtain programmatic compliance with NHPA Section 106 for the repetitive *management actions* occurring on this large inventory of pre-1919 historic housing by means of the program comment alternative procedure under 36 CFR 800.14(e). In accordance with 36 CFR 800.14(e), the Army will implement this program comment and *management actions* in lieu of conducting individual project-by-project reviews.

2.2. Objective

The objective of the program comment is to achieve the goal in a manner that provides the appropriate balance between preservation of the housing and the efficient, consistent, and cost-effective management of the housing in order to improve of the quality of life, health, and safety of the Army families. The goal and objective are met by the ACHP's adoption of the program comment and the Army's implementation of it for its *management actions*.

[15] Federal Register/Vol. 88, No.203/72743. 23 October 2023. *Department of the Army Notice of Availability Program Comment Plan for Preservation of Pre-1919 Historic Army Housing, Associated Buildings and Structures, and Landscape Features.*

2.3. Intent

This program comment recognizes that among federal agencies, the Army faces a unique and significant NHPA Section 106 compliance challenge due to the magnitude of its inventory of historic housing.

This program comment recognizes that the Army's pre-1919 homes are actively used military assets with restricted access and are in general not open to the public.

The Army recognizes that its pre-1919 housing is eligible for and listed in the National Register of Historic Places (NRHP), and that many pre-1919 Army homes are contributing properties in designated NHL districts.

This program comment meets the requirements of NHPA Section 110(f) by planning and taking necessary action that minimize harm to pre-1919 NHLs to the maximum extent possible and provides a higher standard of care for NHL housing than is currently occurring.

This program comment is consistent with the *Secretary of the Interior's Standards for Rehabilitation* (36 CFR 68.3(b)). It provides for the compatible use of the properties through repairs, alterations, and additions, while preserving those portions or features which convey historical, cultural, and architectural values.

This program comment covers a category of undertakings termed *management actions* and affirms that the effect of those *management actions* on pre-1919 Army housing are *not adverse* as addressed in this program comment.

This program comment implements the *Secretary's Standards for Rehabilitation* through the methodology and procedures in sections 7 and 8, and by application of the *Design Guidelines for Pre-1919 Army Housing* and the *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* in appendices A and B.

This program comment recognizes that the *Secretary of the Interior's Standards* must be applied in consideration of the economic and technical feasibility of each project per 36 CFR 68.3.

This program comment recognizes that the *Secretary's Standards for Rehabilitation* allow for the use of *substitute building materials* when the use of *historic building materials* and *in-kind building materials* is not reasonably possible in consideration of the economic and technical feasibility of projects.

This program comment recognizes that the appended *Design Guidelines for Pre-1919 Army Housing* and *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* are applicable guidelines (as referenced in 36 CFR 800.5(a)(2)(ii)) implementing the *Secretary's Standards for Rehabilitation* for pre-1919 Army housing.

This program comment provides a systematic, standardized building materials selection procedure with guidelines that ensure the balanced consideration of repair of *historic building materials* or, where repair is not possible, the use of *in-kind building materials* or *substitute building materials* in management actions.

This program comment ensures that qualified preservation professionals support its implementation.

This program comment recognizes that intensifying climate risks and the ACHP's *Policy Statement on Climate Change and Historic Preservation* may necessitate the use of modern climate resilient *substitute building materials*.

This program comment recognizes that *substitute building materials* are *reversible* and may be replaced with *in-kind building materials* to minimize any diminishment of historic integrity.

This program comment recognizes that the compilation and analysis of original Army Quartermaster Corps housing design plans, extensive historic context documentation, and the Historic American Building Survey (HABS) architectural documentation of pre-1919 Army housing are suitable and appropriate mitigation measures. These program comment mitigation documents are located in a single centralized public site at https://www.denix.osd.mil/army-pre1919-pchh/.

3.0. SCOPE OF THE PROGRAM COMMENT

The program comment applies to *management actions* for all of the Army's pre-1919 housing, associated buildings and structures, and landscape features, both privatized and Army-owned. The best available information indicates there are 867 pre-1919 homes located on 19 installations in 13 states and the District of Columbia. Among these, there are 10 installations where pre-1919 housing has been designated as individual or contributing properties to NHL Districts. The installations and numbers of pre-1919 homes are: Fort Leavenworth, KS 269 homes; Fort Riley, KS 109; Fort Sam Houston, TX 91; West Point, NY 84; Fort Sill, OK 73; Fort Bliss, TX 39; Fort Huachuca, AZ 38; Presidio of Monterey, CA 37; Fort Myer, VA 34; Fort McNair, Washington DC 27; Carlisle Barracks, PA 18; US Army Garrison HI / Fort Shafter, 17; Watervliet Arsenal, NY 8; Rock Island Arsenal, IL 6; Fort Hamilton, NY 6; Picatinny Arsenal, NJ 6; Fort Detrick, MD 2; Arlington National Cemetery, VA and DC 2; and Fort Moore, GA 1.

4.0. DESCRIPTION OF PROPERTY TYPE

Standardized plans developed by the Army Quartermaster Corps were followed for the design and construction of the vast majority of Army pre-1919 housing. Army Quartermaster Corps standardized plans reflected prevailing civilian architectural designs, construction techniques, and community planning trends of the time, with certain regional style variations and use of locally available materials. The Army has documented mitigation measures for pre-1919 housing.

The mitigation documentation[16] includes historic contexts, a documentary history with an extensive compilation and analysis of original Quartermaster Corps plans and drawings including exterior and interior floorplans for pre-1919 homes, and many HABS documents recording the architectural design and features of pre-1919 Army housing in detail. The Army has posted these mitigation documents on the website https://denix.osd.mil/army-pre1919-pchh/. Additional information on the Army's inventory of NHLs is also available in the Army's historic preservation story-map at https://www.denix.osd.mil/army-cr/.

Historic context information is extensive and includes social, economic, and military factors influencing pre-1919 home design. Army Quartermaster Corps housing standardization began in earnest after the close of the Civil War. From 1866 on the Army began its evolution into a modern military force as it abandoned its small temporary frontier posts and consolidated troops into larger regional installations. The need for new, larger, permanent installations required a higher degree of planning and design for buildings as well as post-wide site plans.

When the Army began to contract this work to civilian architects, mid-nineteenth century American architectural designs began to influence both Army building and Army installation designs. The Army Quartermaster Corps standardization of house plans incorporated versions of nationally popular architectural styles. Civilian builder's handbooks, also known as pattern books, were used as source books by the Quartermaster Corps housing design staff.[17] The resulting architectural styles of pre-1919 Army homes include Federal, Gothic Revival, Greek Revival, Italianate, Craftsman, Romanesque, Queen Anne, Colonial Revival, Spanish Revival, and Craftsman. Following design trends of the time, the Army Quartermaster Corps also developed standardized plans for landscaping, neighborhood design, circulation patterns, and the design of installations.

5.0. NATIONAL HISTORIC LANDMARKS

5.1 Pre-1919 Army NHL Housing and NHL Requirements

Of the Army's 867 historic pre-1919 homes, 74% (638) of these homes at ten installations are contributing properties in designated NHL districts. The ten installations with NHL districts are: Fort Leavenworth, KS 269 homes; Fort Sam Houston, TX 91; West Point, NY 84; Fort Sill, OK 73; Fort Huachuca, AZ 38; Fort Myer, VA 34; Carlisle Barracks, PA 18; US Army Garrison HI / Fort Shafter, 17; Watervliet Arsenal, NY 8; Rock Island Arsenal, IL 6. These ten NHL designations by the Department of the Interior/National Park Service are

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[16] *National Historic Context for Department of Defense Installations, 1790-1940*, Volumes I-4. DoD Legacy Resource Management Program Project 92-0075 (1995).
A Study of United States Army Family Housing Standardized Plans, Volumes 1-5., Grashof, B. (1986).
Context Study of the United States Quartermaster General Standardized Plans 1866-1942. Army Corps of Engineers, Seattle District (1997).

[17] *A Study of United States Army Family Housing Standardized Plans*, Volumes 1-5., Grashof, B. (1986).

consolidated and published on the program comment website at https://denix.osd.mil/army-pre1919-pchh/.

NHLs are designated by the Secretary of the Interior under the authority of the Historic Sites Act of 1935. The Historic Sites Act authorizes the Secretary of the Interior to identify historic buildings, and other sites and objects that possess exceptional value in commemorating or illustrating the history of the United States. NHPA Section 110(f) *Planning and actions to minimize harm to National Historic Landmarks* states that prior to the approval of any Federal undertaking that may directly and *adversely affect* any NHL, the Federal agency will to the maximum extent possible undertake such planning and actions as may be necessary to minimize harm to the landmark. The Federal agency also must afford the ACHP and the Secretary of the Interior / National Park Service a reasonable opportunity to comment with regard to the adverse effect undertaking.

The *Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act* (63 FR 20496) provide the National Park Service's guidance to federal agencies for their preservation programs and treatment of NHLs. The standard and guidelines at 4(j) *National Historic Landmarks* states that Federal agencies exercise a higher standard of care when considering undertakings that may directly and *adversely affect* NHLs. Standard 4 states when alternatives to avoid an adverse effect on NHLs appear to require undue cost or to compromise the undertaking's goals and objectives, the agency must balance those goals and objectives with the intent of Section 110(f).

The regulations implementing NHPA Section 106 include specific procedural provisions for NHLs at 36 CFR 800.10. The regulation requires federal agencies to request the ACHP participate in any consultation regarding *adverse effects* to NHLs, and to also invite the Secretary of the Interior / National Park Service to participate in those consultations.

5.2. Standard of Care for Pre-1919 Army NHL Housing and Districts

This program comment confirms that the effects of its *management actions* on pre-1919 Army housing including pre-1919 NHL housing and districts are *not adverse*, as addressed in this program comment. This program comment demonstrates the Army's planning and action to minimize harm to pre-1919 NHL housing and districts by implementing a higher standard of care for those NHLs than has occurred under installation level PAs over the past 20 years. Through its conformance with the *Secretary of the Interior Standards for Rehabilitation* and implementation through the approach, methodology, and procedures in sections 7 and 8, and consideration of the economic and technical feasibility of each project as required by the *Secretary's Standards*, this program comment provides a more effective NHPA compliance solution than is currently in place under installation-level PAs (as discussed in section 1). The program comment supports full implementation of scopes of work for maintenance, repairs, and improvements to NHL housing by ensuring that the full range of appropriate and cost-effective building materials are considered through a systematic approach and standardized methodology. This in turn will help reduce the backlog of deferred maintenance, repairs, and improvements, alleviating issues that lead to vacancy and considerations to demolish pre-1919 NHL homes. It also demonstrates a

more efficient, cost-effective, programmatic solution for rehabilitation of pre-1919 Army housing to help avoid future statutory mandates to demolish pre-1919 Army housing.

Further, the standard set of *management actions* in the Army's three prior program comment procedures for historic housing approved by the ACHP include *adverse effect* actions - cessation of maintenance, demolition, and new construction not in accordance with the *Secretary's Standards for Rehabilitation*. Unlike those three prior program comments, the Army is excluding those adverse effect actions from this program comment. Such adverse effect actions will be addressed outside of this program comment through the process in 36 CFR 800.4 - 800.7, and 36 CFR 800.10 for NHLs. Due to the special considerations required by NHPA Section 110 for NHLs and properties with national level significance, the Army is planning and holding this program comment for pre-1919 housing to a procedurally higher standard of care than prior program comment procedures, minimizing harm and avoiding adverse effects to pre-1919 NHL homes and districts.

6.0. CATEGORY OF UNDERTAKING AND EFFECTS ON HISTORIC PROPERTIES

The category of undertaking for this program comment is *management actions*. *Management actions* are defined for the purposes of this program comment as maintenance, repair, rehabilitation, abatement of hazardous materials, mothballing, lease, transfer, and conveyance. This Program Comment is consistent with and implements the *Secretary's Standards for Rehabilitation* at 36 CFR 68.3(b). When implemented following its substantive and procedural requirements, this program comment and the effects of those *management actions* on pre-1919 Army housing are *not adverse.*

The regulation at 36 CFR 800.5 cites criteria for adverse effect. "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." The adverse effect example in 36 CFR 800.5 relevant to this program comment is alteration of a property that is not consistent with the *Secretary's Standards* (36 CFR 68), and applicable guidelines. This program comment is consistent with and implements the *Secretary's Standards for Rehabilitation*. The *Design Guidelines for Pre-1919 Army Housing* and the *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* appended to this program comment are applicable guidelines. This program comment will maintain the integrity of pre-1919 NHL housing and historic district location, design, setting, materials, workmanship, feeling, and association to the maximum extent possible.

This program comment implements a systematic approach and standardized methodology with specific procedures for selection of appropriate building materials that consider the economic and technical feasibility of each project. It utilizes detailed *Design Guidelines for Pre-1919 Army Housing* and a *Building Materials Guideline and Catalog for Pre-1919 Army Housing* (in appendices A and B) to support the materials selection process.

7.0. APPROACH AND METHODOLOGY

7.1. Implementation of the *Secretary's Standards for Rehabilitation*

In carrying out the *management actions* under this program comment, the Army, or RCI housing partner where housing is privatized will implement the *Secretary's Standards for Rehabilitation* (36 CFR 68.3(b)), taking into consideration the economic and technical feasibility of each project by means of the procedure in section 8 and with reference to the applicable guidelines in appendices A and B. The *Secretary's Standards for Rehabilitation* state:

(1) A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships;
(2) The historic character will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided;
(3) Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken;
(4) Changes to a property that have acquired historic significance in their own right will be retained and preserved;
(5) Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved;
(6) Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence;
(7) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used;
(8) Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken;
(9) New additions, exterior alterations or related new construction will not destroy historic materials, features and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment; and
(10) New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

As stated in National Park Service Preservation Brief 16,[18] the *Secretary's Standards for Rehabilitation* generally require that historic features will be repaired rather than replaced.

[18] Preservation Brief 16 *The Use of Substitute Materials on Historic Building Exteriors*, National Park Service, September 2023.

Standard 6 of the *Standards for Rehabilitation* states that when replacement of a distinctive feature is necessary, the new feature must "match the old in composition, design, color, texture, and other visual properties, and, where possible, materials." While the use of in-kind materials to replace *historic building materials* is preferred under the *Standards for Rehabilitation*, those *Standards* also purposely recognize that flexibility is needed when it comes to the use of *substitute building materials*. *Substitute building materials* that match the visual and physical properties of historic materials have been successfully used by the Army on many rehabilitation projects under the Program Comment for Army Inter-War Era housing in ways that are consistent with the *Standards for Rehabilitation*.[19]

In order to ensure consistency with the *Secretary's Standards for Rehabilitation*, the Army, or RCI housing partner where housing is privatized will implement the *Secretary's Standards for Rehabilitation* through the preservation planning guidelines in appendices A and B, will take the economic and technical feasibility of each project into consideration by following the procedures in section 8, and will have qualified professional assistance available to support application of the *Secretary's Standards for Rehabilitation* and the building materials selection process.

7.2. Preservation Planning Guidelines (Appendices A and B)

The Army, or RCI partner where housing is privatized will plan for the selection and use of appropriate building materials in the repair and rehabilitation of pre-1919 Army housing. Specific building material selection procedures are established in section 8 of this program comment that consider the need to maintain the historic and architectural character of pre-1919 housing in a balanced priority with cost, climate resiliency, materials durability, and the health, safety, and quality of life considerations for military families living in pre-1919 housing. To further ensure that proper planning for and use of appropriate building materials occurs, this program comment also provides for professional support from qualified preservation experts (see section 11) and includes two preservation planning documents: *Design Guidelines for Pre-1919 Army Housing* and *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* incorporated as Appendices A and B, respectively.

The *Design Guidelines for Pre-1919 Army Housing* in Appendix A provide specific information regarding pre-1919 housing architectural styles and identify character-defining features and design elements associated with the pre-1919 architectural styles. Character-defining features include the overall shape, style, and design of the building, decorative details, interior spaces and features, as well as its associated buildings and structures, and landscape features. The *Guidelines* include detailed guidance for rehabilitation, windows and doors, entrances, porches, roofs, foundations and walls, interiors, interior structural systems, historic designed landscapes and features, historic districts, circulation systems, associated buildings and

[19] See the *Annual Reports* submitted to the ACHP for the Program Comment for Army Inter-War Era Housing (1919-1940) at https://www.denix.osd.mil/army-pchh/.

structures, mothballing of housing, emergency repairs and disasters, and actions related to military force protection requirements.

The *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* in Appendix B is used in concert with the *Design Guidelines for Pre-1919 Army Housing*. The *Building Materials Guidelines and Catalog* provides additional specificity on building materials and their use. The *Building Materials Guidelines and Catalog* provides information to assist in selecting the appropriate building materials that maintain the historic and architectural character of the housing and meet cost and technical feasibility requirement of the *Secretary's Standards*. *Catalog* entries are provided for major components of the house design. Design considerations for each catalog entry are derived from the design fundamentals of scale, mass, proportion, and materials. This provides the guidance for selection of appropriate materials and component designs that factor location, type, size, finish and maintenance into their selection. Focus is on appropriate design, applicable materials, and performance characteristics with emphasis on retention of overall housing design integrity.

The *Building Materials Guidelines and Catalog* includes *in-kind,* and *substitute building materials*. It includes some materials such as vinyl windows that while may be allowable under the *Secretary's Standards for Rehabilitation* have been eschewed by some preservationists. These and other modern *substitute building materials* are included in reference to factors related to economic feasibility and technical feasibility such as material durability, energy efficiency, and climate resiliency. Cost and durability are factors relevant for example to the selection of in-kind wood windows or windows made of substitute materials. As stated in National Park Service Preservation Brief 16, *The Use of Substitute Materials on Historic Building Exteriors*, the poor quality of available commercial supplies of lumber no longer provides the denser, more decay-resistant wood of old-growth forests. Due to the poor quality of available lumber used in the manufacture of in-kind wood windows, modern vinyl windows are as or more durable than today's in-kind wood windows. This is made clear by the manufacturer warranty periods provided for vinyl windows which are as long or longer than the manufacturer warranties for in-kind wood windows.[20] Vinyl windows can also provide an adequate visual replication of the historic windows, cost significantly less than in-kind wood windows, have a shorter turn-around time for manufacture and installation, improve energy efficiency, and have lower long-term maintenance requirements.

As stated in National Park Service Preservation Brief 16, when a *substitute building material* is used for replacement, a loss in integrity can sometimes although not always occur. That situation is mitigated by the fact that *substitute building materials* are *reversible* and can be replaced with *in-kind materials* at any point in time. Additionally, the support of qualified professionals (see section 11) in the building materials selection process and monitoring will ensure that the historic character of pre-1919 housing and historic districts is maintained.

[20] See *Supplemental Information Briefing* at https://www.denix.osd.mil/army-pre1919-pchh/.

7.3. Consideration of Interior Spaces

The Army has extensive documentation and recordation of the interiors of pre-1919 housing. The original floorplans designed by the Army Quartermaster Corps for pre-1919 housing have been collected, categorized, reproduced, and analyzed in *A Study of United States Army Family Housing Standardized Plans*, Volumes 1-5, (Grashof, B., 1986), posted at https://www.denix.osd.mil/army-pre1919-pchh/. The Army also has 77 HABS documents for pre-1919 housing posted at https://www.denix.osd.mil/army-pre1919-pchh/ which represent a sample of over 10% of the Army's pre-1919 housing units. The housing selected for HABS documentation are the most representative examples of this category of Army housing and records their setting, interiors, and exteriors. The extensive historical documentation and analysis of original floorplans combined with the HABS recordation of pre-1919 Army housing are suitable and appropriate mitigation measures for this program comment.

The Army's pre-1919 homes have been continuously occupied by Army families for 100 to 200 years and the original interior floorplans have all been modified. Current floorplans include rooms that were not features of the original Quartermaster Corps design, new walls and partitions have been added to expand kitchens and to create bathrooms and closets that were not features of original construction. Additions have been made, floors, walls, and ceilings have been cut through and modified to add plumbing, electrical service, and heating and ventilation ductwork, plaster walls have been replaced with drywall, paint and plaster have been removed to create a new appearance. Some of the homes have had complete renovations prior to enactment of the NHPA; for example, Quarters 1 is a pre-1919 home at Fort Myer, Virginia documented to have been "completely renovated" in 1953.[21]

The *Secretary's Standards for Rehabilitation* state that changes to a property that have acquired historic significance in their own right will be retained and preserved. The significance of the interiors of pre-1919 Army housing is that they represent such changes in terms of the ongoing evolution of interior spaces in response to changing technological, military, and quality of life, health, and safety requirements, and interior design trends. To maintain their significance, the interiors must continue to develop and change in response to changing military, technological, and social needs, and such changes will acquire future historic significance in their own right. The interiors of pre-1919 Army housing would be adversely affected if their development were frozen at an arbitrary point in time.

The *Design Guidelines for Pre-1919 Army Housing* in Appendix A contain Guidelines for Interiors. In consideration of the above, the Guidelines for Interiors state that where the existing interior floorplan does not accommodate current technological, military, or quality of life, health, and safety requirements, floorplan reconfiguration is acceptable if implemented in accordance with the Guidelines. The Guidelines for Interiors requires the retention of interior features that are important in defining the overall historic character of the building to the extent

[21] Quarters 1, Fort Myer. *General Condition and Programmed Improvements*. June 20, 1967. Fort Myer Quarters 1, HABS documentation package, posted at https://www.denix.osd.mil/army-pre1919-pchh/.

possible. Interior character-defining features include columns, cornices, baseboards, crown molding, fireplaces and mantels, stairs, and ceiling height. Before removing interior walls that would result in a loss of historic features the Army, or Army housing partner where the housing is privatized will first consider options to retain those interior walls and historic features. If, following consideration of the economic and technical feasibility of the project, the Army or Army housing partner where the housing has been privatized must proceed with the removal of interior walls, they will consider retaining historic features. When in situ preservation of such historic features is not possible, the Army or Army housing partner will retain such historic features through salvage and will preserve those features through reuse on other similar housing at that location, to the maximum extent possible.

8.0. PROCEDURE FOR BUILDING MATERIALS ASSESSMENT AND SELECTION

8.1. Building Materials Selection Procedure Summary

The Army, or RCI partner where housing is privatized, will implement the following building materials selection procedure in support of *management actions*. The procedure first evaluates the character and condition of the *historic building material* and considers if the repair of *historic building material* is financially and technically feasible. If repair of *historic building materials* is not feasible, *in-kind building materials* or *substitute building materials* are considered for replacement of *historic building materials* with reference to the *Design Guidelines for Pre-1919 Army Housing* and *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* in appendices A and B. Section 11 of this program comment ensures qualified historic preservation experts are available to support implementation of the building materials selection procedure. This procedure ensures preservation of the integrity of pre-1919 NHL housing and districts to the maximum extent possible by a thorough consideration of character defining features, design, materials, workmanship, feeling, and association.

8.2. Building Materials Selection Procedure

Prior to execution of a project under an applicable *management action*, the following step-by-step procedure will be implemented by the Army, or by the RCI partner where housing is privatized:

(1) Characterize the *historic building materials* present in terms of condition, design, material properties, performance, safety, and presence of hazards such as lead-based paint, asbestos, and other hazardous materials;

(2) Determine if *historic building materials* can be repaired or if they must be replaced due to technical and financial feasibility factors. Consider health and safety factors, availability of historic materials and/or skilled craftsmen, need to improve quality of life, climate resiliency, energy efficiency. Assess financial feasibility and determine if costs of repair will impede full implementation of scope of the project;

(3) If replacement is required, determine if there are material characteristics of the *historic building materials* that should be improved upon;

(4) Identify potential *in-kind building materials* and *substitute building materials* with

reference to appendices A and B. Compile a short list of potential *in-kind building materials* and/or *substitute building materials*;

(5) Determine the technical feasibility of the potential *in-kind* and *substitute materials* by evaluating quality of life, health and safety considerations, climate resiliency, energy efficiency, long-term durability of materials;

(6) Determine the financial feasibility of the potential *in-kind* and *substitute materials* through an assessment of the project budget and consideration of materials and labor costs to ensure full implementation of the project. Cost assessment should also include consideration of historic preservation tax credits; and

(7) Select the appropriate *in-kind building material* or *substitute building material* and use the selected material in the management action.

To ensure *management actions* follow the building materials selection procedure, *Design Guidelines for Pre-1919 Army Housing*, and the *Building Materials Guidelines and Catalog for Pre-1919 Army Housing*, the Army Federal Preservation Officer (FPO) will:

(1) Ensure installations and Army privatized housing partners with pre-1919 housing have access to the building materials selection procedure in this Program Comment, the *Design Guidelines for Pre-1919 Army Housing* (Appendix A), and the *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* (Appendix B);

(2) Ensure that qualified historic preservation professionals are available to support the building materials selection process and application of the *Secretary Standards for Rehabilitation* as implemented through appendices A and B, and to provide on-site monitoring for activities under this program comment;

(3) Maintain oversight of the *Design Guidelines for Pre-1919 Army Housing* and the *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* and update the *Building Materials Guidelines and Catalog Pre-1919 Army Housing* as new applicable building materials become available; and

(4) Make the program comment, *Design Guidelines for Pre-1919 Army Housing* and *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* publicly available on the Army's pre-1919 program comment website.

9.0. HISTORIC PRESERVATION TAX CREDITS

The Army FPO will advise its RCI privatized housing partners that pre-1919 housing rehabilitation may be eligible for Federal and State historic preservation tax credits. Additional information may be found at the National Park Service Historic Preservation Tax Incentives page https://www.nps.gov/subjects/taxincentives/index.htm, and at the Internal Revenue Service web page https://www.irs.gov/businesses/small-businesses-self-employed/rehabilitation-tax-credit-real-estate-tax-tips. Individual states may also offer similar state-level tax incentive programs for historic building rehabilitation and additional information on state-level historic preservation tax incentive programs may be obtained from the relevant State Historic Preservation Office. It is noted that the National Park Service approves federal tax act rehabilitation projects that include use of *substitute building materials*.

10.0 ANNUAL REPORT AND ANNUAL MEETING

The Army FPO will provide an annual report to the ACHP for the previous reporting year regarding activities under this program comment. The annual report will identify any significant issues that may have arisen while implementing the program comment, how those were addressed, and how they may be avoided in the future. The annual report will also include an assessment of the overall effectiveness of the Program Comment in meeting its intent, and a summary of professional assistance and compliance monitoring activities. Annual reporting will occur for five years beginning from the date of the ACHP Federal Register notice of issuance of this program comment.

Following submission of an annual report, or upon the ACHP's request, the Army will schedule a meeting with the ACHP and any other ACHP identified invitees to discuss implementation of the program comment. The meeting provides an opportunity for attendees to provide their views on the overall effectiveness of the program comment in meeting its intent and purpose. Annual meetings may take place in-person, by phone, virtually using electronic meeting platforms, or any combination of such means.

11.0. PROFESSIONAL ASSISTANCE BY QUALIFIED EXPERTS

The Army FPO will provide for professional assistance and monitoring of activities under this program comment by qualified experts. Professional assistance will be available to the Army's RCI partners by experts that meet qualification standards published in 36 CFR Part 61 for architectural history, architecture, historic architecture, or history. Professional assistance will include on-site technical support, on-call technical support, and on-site assistance visits and monitoring.

The Army FPO will provide the contact information of the qualified experts to the RCI partners. The technical expert support includes review of the requirements under this program comment, support for implementation of the *Secretary's Standards for Rehabilitation* and the building materials selection process, use of appendices A and B, and monitoring and reporting on activities implemented under this program comment. The Army FPO will ensure that a minimum of five annual on-site technical assistance and monitoring visits occur each reporting year for installations with privatized pre-1919 housing. On-call technical assistance will also be available to the Army's RCI partners via telephone, email, and virtual meetings. The professional assistance and on-site monitoring activities will be reported in each Annual Report.

12.0 APPLICABILITY AND IMPLEMENTATION

The program comment applies to all privatized and non-privatized pre-1919 Army housing, associated buildings and structures, and landscape features. Where pre-1919 housing has been privatized, Army privatized housing partners are responsible for implementing this program comment and all *management actions* following the procedures herein. Where housing has not been privatized, or when there is a reversion of leased or otherwise conveyed pre-1919

housing from a privatized management entity back to the Army, Army installation personnel will implement all *management actions* following this program comment.

The Army, or RCI partner where housing is privatized will implement the *management actions* in accordance with this program comment in lieu of conducting individual project reviews under 36 CFR 800.4 - 800.7 or installation PAs, Memoranda of Agreement (MOAs), or Army Alternate Procedures (AAP). This program comment supersedes and replaces the requirements in all Army installation PAs, MOAs, and AAPs pertaining to *management actions* for pre-1919 housing, associated buildings and structures, and landscape features. The Army and its privatized housing partners will implement this program comment in lieu of all PA, MOA, and AAP requirements and procedures previously applicable to the *management actions* for pre-1919 Army housing, associated buildings and structures, and landscape features. To further clarify program comment implementation, existing PAs, MOAs, and AAPs are not voided, rather the program comment simply replaces the requirements applicable to pre-1919 housing *management actions* in existing agreements with the requirements of this program comment.

The program comment is a stand-alone NHPA Section 106 compliance document approved by the ACHP. PAs, MOAs, and AAPs shall not be developed or amended to "implement" the program comment. The terms of the program comment are not subject to any change, amendment, or further consultation through PAs, MOAs, AAPs, or other NHPA-related actions. Changes to the terms of the program comment can only be made following the amendment procedures in section 14 this program comment.

The Army or RCI partner where housing is privatized will also implement the program comment in lieu of any procedures, environmental management plans, guidelines, reporting requirements, Integrated Cultural Resources Management Plans, and all other installation documents, standards, procedures, or guidelines pertaining to pre-1919 housing, associated buildings and structures, and landscape features.

The Army, or RCI partner where housing is privatized will not implement any further historic property identification, evaluation, documentation in connection with pre-1919 housing and the *management actions* covered by the program comment. Pre-1919 Army housing is adequately identified, evaluated, and documented by the referenced mitigation documents at https://denix.osd.mil/army-pre1919-pchh/.

Army pre-1919 housing and historic districts are the equivalent of similar historic housing developments in the civilian sector. As such, there is significant prior ground disturbance in pre-1919 housing areas resulting from the original construction the housing and subsequent improvements over the past 100 to 200 years including overall grading for the original construction, housing construction, construction of associated buildings and structures, road and sidewalk construction, installation of above and below ground utilities, landscaping, construction of recreational structures, and other ground disturbing actions that have occurred after original construction. Such areas of extensive ground disturbance associated with housing development are generally considered to have a low probability for the presence of NRHP eligible archeological properties. No further efforts to identify archeological properties or other

historic properties will be conducted in connection with the implementation of program comment *management actions*.

The Army, or RCI partner where housing is privatized will protect known archeological resources and preserve them in place whenever possible. If such resources must be disturbed, mitigation measures will be undertaken by the Army. If implementation of any *management actions* under this program comment may cause damage, physical destruction, or change in the physical features of all or any part of a known NRHP eligible archeological site or property of traditional religious and cultural importance to Federally recognized Indian tribes or Native Hawaiian Organizations, those effects will be addressed by the Army following the procedures in 36 CFR 800.4 - 800.7 in consideration of applicable principles in the ACHP *Policy Statement on Burial Sites, Human Remains, and Funerary Objects*, or by following procedures in an applicable installation PA. The unanticipated discovery of a NRHP eligible archeological property or human remains during implementation of *management actions* will be addressed following the procedures in 36 CFR 800.13, or by following the unanticipated discovery procedures in an applicable installation PA, and / or by following the compliance procedures of the Native American Graves Protection and Repatriation Act, as applicable.

The Program Comment is not applicable to pre-1919 housing, associated buildings and structures, and landscape features that have previously been determined to be not eligible for inclusion in the NRHP in accordance with 36 CFR 800.4(c)(2), an applicable NHPA agreement document, or by a determination of eligibility pursuant to 36 CFR 63. Properties that are not listed, or eligible for listing, in NRHP are not subject to the requirements of the NHPA. If at a future date pre-1919 housing, associated buildings and structures, and landscape features previously determined not eligible for inclusion in the NRHP are reassessed and subsequently determined to be eligible for inclusion in the NRHP, NHPA Section 106 compliance for those properties shall occur by means of this Program Comment.

13.0. EFFECT AND DURATION

This program comment will remain in effect from the date of adoption by the ACHP through December 31, 2055, unless prior to that time the Army determines that such comments are no longer needed and notifies the ACHP in writing, or the ACHP withdraws the program comment in accordance with 36 CFR 800.14(e)(6). Following such withdrawal, the Army will be required to comply with Section 106 through the process in 36 CFR 800.4 - 800.7, or an applicable program alternative under 36 CFR 800.14, for each individual undertaking formerly covered by this program comment.

The effective period for the program comment coincides with the term of the ground leases that have been executed with the Army's privatized housing partners under the RCI program. Upon termination of the ground lease, ownership of all RCI partnership owned improvements including all housing that is located within the boundaries of the ground lease is automatically conveyed back to the Army. On or prior to December 31, 2055, the Army and the ACHP will meet to determine whether to consider an extension to the term of this program comment.

14.0. PROGRAM COMMENT AMENDMENT AND WITHDRAWAL

The ACHP may formally amend this program comment after consulting with the Army and other parties as it deems appropriate.

14.1. Amendment by Chairman, ACHP

The Chairman of the ACHP, after notice to the rest of the ACHP membership and the Army may amend this Program Comment to extend its duration. The ACHP will notify the Army and will publish notice in the Federal Register regarding such amendment within 30 days after their issuance.

14.2. Amendment by Executive Director, ACHP

The Executive Director of the ACHP, after notice to the ACHP membership and the Army may amend this Program Comment to adjust due dates and make corrections of grammatical and typographical errors. The ACHP will notify the Army and will publish notice in the Federal Register regarding such amendments within 30 days after their issuance.

14.3. Other Amendments

Amendments to this Program Comment not covered by sections 14.1 or 14.2, above, will be subject to ACHP membership approval.

14.4. Withdrawal of the Program Comment

If the ACHP determines that treatment of Army pre-1919 housing is not being carried out in a manner consistent with this Program Comment, the ACHP may withdraw the Program Comment. The Chairman will then notify the Army and will publish notice in the Federal Register regarding withdrawal of the Program Comment within 30 days of the decision to withdraw. If this Program Comment is so withdrawn, the Army shall comply with the requirements of 36 CFR 800.4 – 800.7, or an applicable program alternative, for individual undertakings covered by this program comment.

15.0. DEFINITIONS

The following definitions apply for the purposes of the program comment:

Abate or abatement means actions to eliminate, lessen, reduce, or remove hazardous and toxic materials, and unsafe conditions.

Army Pre-1919 historic housing is all privatized and non-privatized Army housing, with construction completed prior to January 1, 1919, located on an Army installation, a joint base, or managed by the Army or by an Army privatized housing partner including those operating under the RCI program. The terms *housing*, *pre-1919 housing,* and *pre-1919 historic Army housing* are

used interchangeably in the program comment and mean all Army pre-1919 historic housing, associated buildings and structures, landscapes and landscape features, and neighborhoods. Quarters 18 at Palm Circle, Fort Shafter, HI constructed in 1924 is included in this Program Comment to ensure consistent treatment of the housing in this predominantly pre-1919 historic district.

Army pre-1919 neighborhood means a geographical area, district, development, community, subdivision, or locality on an installation that is characterized by and comprised predominantly of Army pre-1919 housing, associated buildings and structures, and landscapes and landscape features.

Associated buildings and structures includes detached garages, carports, storage buildings, above and below ground utilities and service systems including water, sewage, storm water, gas, and electrical service systems, tennis courts, pools, all buildings and structures associated with recreational and athletic activities, playgrounds and playground equipment, all other recreational buildings and structures, gazebos, fencing, community centers, shelters, associated ancillary facilities that support housing, and any and all other buildings, structures, and objects associated Army pre-1919 housing located within Army pre-1919 housing neighborhoods.

Associated ancillary purposes that support housing operations (reference *Lease, transfer, and conveyance*) refers to the use of pre-1919 housing, buildings, and structures for purposes such as offices including rental offices for privatized housing partners, community centers, public safety offices that service the housing areas, and other purposes that support housing operations and residents of pre-1919 housing.

Climate resilient building materials means, for the purposes of this program comment, modern building materials that are used to retrofit historic buildings in order to better withstand and recover from the negative impacts of climate change including extreme weather events. Climate resilient building materials help minimize those impacts on people and on the costs to retrofit and repair historic buildings, while preserving their historic character as much as possible.

Economic feasibility means a determination if the estimated costs of a proposed project including consideration of the project's available budget, the cost of building materials, labor, and other considerations, may jeopardize the viability and complete implementation of the full scope and all parts of the proposed project. The term economic feasibility is used interchangeably with financial feasibility and cost feasibility for the purposes of this program comment.

Financial feasibly see definition of *economic feasibility.*

Health and safety hazards means housing that has any of the following conditions: damaged roofs or walls; non-functional or poorly functioning mechanical systems; unsafe common areas such as stairs; significant rodent, insect, or mold infestations; lead based paint exposure risks; asbestos exposure risks; risk of exposure to other chemical or environmental hazards; violations of health and safety codes and standards; damages due to fire, flooding, or natural disasters; and other conditions that present health hazards or make the housing unsafe or uninhabitable.

Historic building materials means building materials that were used in the initial construction of pre-1919 housing, and/or for designated NHLs, all materials within the period of significance.

Historic character means the same as the terms usage in *The Secretary of the Interior's Standards for the Treatment of Historic Properties* at 36 CFR 68.

Historic designed landscapes and features are landscapes and their features that were designed or laid out by a landscape architect, master gardener, architect, or horticulturist according to design principles, and retain significant character-defining features of their original design.

Historic district means a geographically definable area that possesses a significant concentration of historic buildings, associated buildings and structures, and objects united historically by plan or physical development that area eligible for inclusion or that are included in the National Register of Historic Places (NRHP).

Historic property means buildings, sites, structures, objects, and districts that are eligible for inclusion or that are included in the NRHP.

Homes and *housing units* are used interchangeably for the purposes of this program comment.

Imitative substitute building materials means modern, industry standard, natural, composite, and synthetic materials that that simulate the appearance, physical properties, and related attributes of historic materials well enough to make them alternatives for use when historic building materials require replacement. The terms *imitative substitute building materials* and *substitute building materials* are used interchangeably for the purposes of this program comment and apply to both interior and exterior building materials.

In-kind building materials means new building materials that are identical to historic building materials in all possible respects, including their composition, design, color, texture, and other physical and visual properties.

Landscape features and landscapes includes the overall design and layout of the pre-1919 housing neighborhoods including roadway circulation systems and patterns, plantings and landscaping, gardens, open spaces, playgrounds, recreational landscape features including but not limited to recreational and athletic fields, golf courses, fencing, parking areas, signage, site furnishings, parade grounds, lighting, sidewalks and curbing, driveways, setbacks, historic designed landscapes and features, all visual elements and viewsheds into pre-1919 housing and neighborhoods and out from pre-1919 housing and historic districts into other historic properties and districts, any and all other landscape features present in pre-1919 housing and historic districts, and any archeological properties or features associated with pre-1919 housing construction. The term *landscape features* as used in the program comment is inclusive of all landscapes and landscape features in pre-1919 historic districts.

Lease, transfer, and conveyance means the execution of lease, transfer, and conveyance documents for lease, possession, management, operation, and transfer of pre-1919 housing solely for the purposes of and use as housing and associated ancillary purposes that support housing operations. Includes execution of housing transfers and conveyances of ground leases and property ownership between privatized housing partners, and between privatized housing partners and the Army.

Maintenance and repair means activities required to maintain the interior and exterior of housing, mechanical systems, and all interior and exterior building features, elements, and materials in an operational state, or to bring them back to operating condition by repair or replacement of obsolete, broken, damaged, or deteriorated mechanical systems, features, elements, and materials on housing interiors or exteriors.

Management actions means maintenance, repair, rehabilitation, abatement of hazardous materials, mothballing, lease, transfer, and conveyance.

Mechanical systems means heating, ventilation, air conditioning, plumbing, and electrical systems, and the individual elements and components of each system.

*Mitigation measure*s means any existing, new, or updated materials or actions that serve to address, reduce, minimize, or otherwise mitigate adverse effects on historic properties, and may include research reports, historical documentation, recordation, and other materials and activities.

Mothballing means an action to close and deactivate housing and /or associated buildings and structures for an extended period, with the intent that the property would be brought back to a mission supporting operational status at some future time.

National Historic Landmark means historic properties formally designated by the Secretary of the Interior under the authority of the Historic Sites Act of 1935, that possess exceptional value in commemorating or illustrating the history of the United States.

Physical properties means overall size, dimensions, and visual appearance.

Privatized housing means Army housing that has been privatized under the Army's Residential Communities Initiative (RCI). The RCI operates on Army installations through the operation of legal partnerships between the Army and private sector developers. At each installation where RCI housing is located, the Army conveys ownership of existing housing and leases land to the RCI partnership. The RCI partnership with the Army then operates and manages the conveyed housing and leased lands for military housing purposes.

Professional assistance means assistance from an individual who meets the Professional Qualification Standards previously published in 36 CFR 61 in the field of architectural history, architecture, historic architecture, or history.

Rehabilitation means, in accordance with the *Secretary's Standards for Rehabilitation* at 36 CFR 68.3(b), the act or process of making possible an efficient compatible use for pre-1919 housing through repair, alterations and additions while preserving those portions or features that convey its historical, cultural or architectural values. Includes actions to improve energy efficiency and climate resiliency, address obsolete, damaged, deteriorated, or defective interior and exterior building materials and elements, and make other changes to improve the quality of life, health, and safety of residents. Rehabilitation includes additions, exterior alterations, and adjacent or related construction allowed under the *Secretary Standards for Rehabilitation (9)* and *(10)*, provided they are in accordance with the design guidelines in appendix A.

Substitute building materials means modern, industry standard, natural, composite, and synthetic materials that simulate the appearance, physical properties, and related attributes of historic materials well enough to make them alternatives for use when historic building materials require replacement. The terms *substitute building materials* and *imitative substitute building materials* are used interchangeably for the purposes of this program comment and apply to both interior and exterior building materials.

Technical feasibility means an assessment of relevant factors to determine if an action, project, or product is suitable, practical, viable, and can be successfully implemented. For the purposes of this program comment, technical feasibility factors include quality of life, health, safety, climate resiliency, energy efficiency, durability of building materials, and compliance process time.

Texture means the visual surface appearance of building materials.

To the maximum extent possible means implementation of actions to the extent capable of being carried out with reasonable effort taking into account economic and technical feasibility.

Viewshed includes all the area visible from a particular location, viewing point, or series of viewing points. It includes all visual elements and surrounding points that are in the line of sight from any location, viewing point, or series of viewing points and excludes all points and locations that are not visible and/or are obstructed by terrain, other natural features, man-made features, and points beyond the horizon.

16.0. APPENDICES

APPENDIX A - DESIGN GUIDELINES FOR PRE-1919 ARMY HOUSING[22]
APPENDIX B - BUILDING MATERIALS GUIDELINES AND CATALOG FOR PRE-1919 ARMY HOUSING[23]

[22] From *Design Guidelines for Department of Defense Historic Buildings and Districts*. Heather McDonald and Michelle Michael. August 2008. DoD Legacy Program Project 07-382.
[23] Prepared by R. Christopher Goodwin & Associates.

The Design Guidelines in Appendix A and the Building Materials Catalog in Appendix B, along with the building materials selection procedure in section 8 are the means whereby the Army implements the *Secretary's Standards for Rehabilitation*. The guidelines in Appendix A and B were prepared with the assistance of qualified experts that meet qualification standards published in 36 CFR Part 61 for architectural history, architecture, historic architecture, or history.

APPENDIX A: DESIGN GUIDELINES FOR PRE-1919 ARMY HOUSING

The *Secretary's Standards* at 36 CFR 68 were developed to provide guidance for the appropriate treatment of historic properties and address four treatments: preservation, rehabilitation, restoration, and reconstruction. For all historic housing, the Army implements the *Standards for Rehabilitation*. Rehabilitation allows a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values. Per 36 CFR 68, the *Standards* are applied taking in consideration economic and technical feasibility.

Purpose

The purpose of these *Design Guidelines* is to help maintain the historic and architectural character of pre-1919 housing and its associated buildings and structures, and landscape features while addressing quality of life, health, and safety issues faced by the military families who live in the historic housing. The Army must balance quality of life issues, health risks associated with lead-based paint and other hazards in historic housing, and the high costs associated with historical and in-kind building materials with the requirement to preserve the historic character of historic housing. This balance among these important issues is accomplished through implementation of Section 8.0, these *Design Guidelines*, the *Building Materials Guidelines and Catalog*, and the use of historic, in-kind, and substitute building materials.

Character-Defining Features

The character of a historic building is established by its form, size, scale, and decorative features. Character-defining features include the overall shape, style and design of the building, decorative details, as well as its associated buildings and structures, and landscape features. When identifying a building's character-defining features it is important to understand the features associated with a particular architectural style. Pre-1919 architectural styles commonly used by the Army Quartermaster Corps and found on installations include Gothic Revival, Greek Revival, Italianate, Romanesque, Queen Anne, Craftsman, Colonial Revival, Spanish Colonial Revival. Earlier antebellum homes such as present at West Point Miliary Academy represent the Federal style. It is important to understand that any given example of pre-1919 Army housing may not exhibit all character-defining features or materials of its architectural style, has been modified over time, and may exhibit features of several different architectural styles.

Pre-1919 Architectural Styles and Character Defining Features:

Federal 1780-1820, locally to 1840: Symmetry of façade with a central door, Side-gable or hipped roof, 6 over 6 double hung windows, elliptical fanlight or transom over door with sidelights, three-part window or Palladian window in center of upper floor, paneled door, cornice usually with dentil molding or other decorative molding, front porticos with classical columns, decorative details such as swags or festoons, quoins and pilasters, belt courses, curving stairs, dormers usually front gable, end chimneys, roof balustrades, cupolas.

Gothic Revival, 1840-1880: Steeply pitched gable roofs, parapets or castellated walls decorated vergeboards, windows extend into gables, 1 over 1 or 2 over 2 double hung windows or casement windows, pointed or arched windows, oriel or bay windows, drip mold for window crowns, tracery at top of windows, paneled doors, elaborate or simple towers and turrets, clover-like foils, one-story entry or full width porch.

Greek Revival, 1825 - 1860: Symmetrical, gabled or hipped roof, entry porch or full width porch supported by square or round columns, central door with transom and sidelights, elaborate door s urround or enframement, cornice with wide band of trim 6 over 6 double hung windows, three-part windows, window crowns or lintels.

Italianate, 1840-1885: Usually a low pitch hipped roof, sometimes front gable 2 or 3 stories, rarely 1 story, symmetrical or asymmetrical façade, groupings of windows, tall narrow arched or rectangular windows usually 1 over 1 or 2 over 2 double-hung sashes, one-story bay windows, window crowns hooded, bracketed or framed, half-glazed paired doors usually arched or rounded, square cupolas or towers, full-width porch or small entry porch, square columns or columns with brackets, wide overhanging eaves with decorative brackets.

Romanesque Revival, 1870—1900: Asymmetrical, hipped roofs with cross gables, masonry or stone walls usually with rough-faced or square stonework, sometimes polychromic stonework, polychromed slate roof, dormers, eyebrow, hipped and gabled rectangular windows, usually with stone transoms, rows of windows, usually deeply recessed, round-topped arches, towers usually round or square.

Queen Anne (1880-1910): Steeply pitched roof of irregular shape usually with a front facing gable, patterned shingles, cut-away bay windows, asymmetrical façade with partial or full-width porch usually one story high and extended along the side walls.

Colonial Revival, 1880—1955: Hipped or gabled roof, symmetrical or asymmetrical 2-stories, sometimes 1-story with a 1-story side wing, central entry door, paneled door with decorative crown supported by pilasters or columns, fanlights and sidelights, double-hung windows with multipane glazing in one or both sashes, paired windows, accentuated front entry sometimes with full-width porch or small portico.

Beaux-Arts (1885—1930) and Classical Revival (1900—1920): Symmetrical, 2+ stories, flat, hipped or mansard roof, masonry walls, Decorative details (quoins, pilasters or columns),

decorative garlands, floral patterns and shields, pedimented and bracketed windows, roof balustrade, accentuated cornice.

Spanish Colonial Revival, late 19th century and early 20th century: Symmetrical or asymmetrical gabled, hipped or flat roof, multi-level roofs, overhanging eaves, stucco or adobe walls, usually red tile (barrel or flat) roof covering, mission shaped dormer or roof parapet, towers (round or square), quatrefoil window, arcaded entry porch, arches above windows and doors, balconies (open or roofed), decorative tiles.

Craftsman (1905-1930): Low pitched, gable roof (occasionally hipped)**,** unenclosed eave overhang, beams or braces under gables, full or partial-width porches with tapered columns.

Guidelines:

Guidelines for Rehabilitation, Additions, Exterior Alterations, and Adjacent or Related Construction

a. The appearance and character defining features of pre-1919 housing and associated buildings and structures will be maintained to the maximum extent possible during these activities.
b. Where the existing housing does not accommodate current quality of life requirements, interior floorplan alterations, exterior alterations, new additions, are acceptable when implemented in accordance with these Guidelines.
c. Exterior alterations and additions will maintain the character of the historic housing and will be compatible with the mass, form, character-defining features, and architectural style of the historic housing. Ensure the size and scale of new additions in relationship to the building do not diminish, obscure or overwhelm the view and character of the historic building and / or viewshed out from or into any historic district(s).
d. Additions will be placed in the rear and on secondary elevations of the housing to maintain the front character-defining elevation and will be compatible with the scale, character-defining features, and architectural style of the historical housing and the associated buildings and structures, and landscape features.
e. Where removal of exterior and interior character-defining historical materials or features is required, either in-kind or imitative substitute building materials may be used for replacement of removed or deteriorated or unsafe historic building materials.
f. Restoration of missing documented historic features is not required.
g. New additions, exterior alterations, and adjacent or related construction will not destroy historic materials, features and spatial relationships that characterize the property to the extent possible. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and the historic district.
h. New additions and adjacent or related construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Guidelines for Windows and Doors

a. Maintain windows and their functional and decorative features including but not limited to the following: frames, sashes, muntins, sills, decorative jambs and moldings, hardware, shutters and detail materials such as stained glass, beveled glass, textured glass or tracery to the extent possible. If windows and their functional and decorative features are failing or present a lead-based paint or other hazard, encapsulate, abate (such as dip-stripping), or replace if necessary with in-kind or imitative substitute building materials.
b. Maintain historic doors and their functional and decorative features including but not limited to the following: frames, panels, glazing, sidelights, fanlights, sur- rounds, thresholds, hardware and screen doors to the extent possible. If doors and their functional and decorative features present a lead-based paint or other hazard, encapsulate or replace with in-kind or imitative substitute building materials.
c. When an entire window or door requires replacement, it is appropriate to replace using imitative substitute materials where in-kind materials are not technically or financially feasible, less durable, or are less climate resilient.
d. Awnings may be installed over windows and doors but should not obscure or damage the windows, doors, or other character-defining features.
e. Storm windows can be installed but should not obscure character defining features of the window. For example, if a window is a double-hung sash, install a storm window with a horizontal divider that matches the location of the divider on the existing window.
f. Storm doors can be installed so that they do not obscure or damage the existing door and frame. Select storm doors compatible with the color and character of the existing door.
g. If entirely new window openings or door openings are required, they should be installed on secondary elevations (rear elevation or elevations not visible from the street). The new windows should be compatible with, but not duplicate, the building's historic windows and fenestration to avoid creating a false historical appearance.
h. Windows or doors that have to be covered for security and other purposes should be locked, cleaned, and covered on the exterior or interior rather than infilled with a permanent material such as brick or concrete, where security requirements allow. Covering on the interior is preferred.
i. Historical windows and doors that are removed should be salvaged and retained if possible for preservation through reuse on similar properties.

Guidelines for Entrances, Porches and Details

a. Maintain historic entrances, porches and their functional and decorative features including columns, pilasters, piers, entablatures, sidelights, transoms, steps/stairs, railings, floors and ceilings.
b. Maintain and repair historic entrances, porches and their features through appropriate methods. If repair or replacement of historical materials presenting a lead-based paint or other hazard is required, encapsulate, or replace with in-kind or imitative substitute building materials.
c. If a portion of an entrance, porch or feature is deteriorated beyond repair or presents a lead-based paint or other hazard, it is appropriate to replace using imitative substitute

materials where in-kind materials are not technically or financially feasible, less durable, or are less climate resilient.

d. If replacement of an entire entrance, porch or feature is necessary, it is appropriate to replace using imitative substitute materials where in-kind materials are not technically or financially feasible, less durable, or are less climate resilient.
e. It is inappropriate to enclose a historic front or primary entrance or porch. If enclosure of a historic entrance or porch on a secondary elevation is necessary, design the enclosure to maintain the historic character of the entrance or porch, building and district. For instance, recess the enclosure behind columns, balustrades and other features and/or consider using glass instead of solid materials.

Guidelines for Roofs

a. Maintain historic roof coverings, functional and decorative features (including but not limited to cresting, dormers and chimneys) whenever possible.
b. Protect and maintain roofing materials through regular maintenance using appropriate methods, including removal of debris from roofs and cleaning and maintenance of gutter systems.
c. If a portion of a historic roof covering or feature is deteriorated beyond repair, it is appropriate to replace using imitative substitute materials where in-kind materials are not technically or financially feasible, less durable, or are less climate resilient.
d. If replacement of an entire historic roof covering or feature is needed, it is appropriate to replace using imitative substitute materials where in-kind materials are not technically or financially feasible or are less climate resilient.
e. Gutter systems should be compatible with the historic character of the building and/or historic district. In-kind or imitative substitute gutter materials may be used and should avoid concealing other architectural features to the extent possible. If replacement of gutters is needed, it is appropriate to replace using imitative substitute materials where in-kind materials are not technically or financially feasible.
f. Non-functional concealed, built-in gutter systems may be repaired with in-kind or replaced with modern exposed gutters similar to others in common use within the neighborhood or historic district. Installation of exposed gutters should avoid concealing other architectural features to the maximum extent possible.
g. It is inappropriate to apply new features (such as balustrades, cupolas and cresting) where none currently exist. Restoration of missing historic features is not required.
h. New roof features such as skylights, vents, solar panels, antennas, satellite dishes and mechanical equipment should be installed in areas not visible from the street if possible.
i. Dormers and additions to roofs will be compatible with the character of the historic home in size, design and scale, and will be located in areas not visible from the street if possible.
j. It is inappropriate to use temporary measures long term, such as exposed tarpaper as a finished roofing material. In addition, tar or asphalt products should not be used to patch clay tiles, slate, wood or metal roofs. In-kind or imitative substitute materials may be used as patch treatment.

k. If historic roofing material has previously been replaced with a different material, i.e., if a slate, wood shingle, or clay tile roof has been replaced at some point in time with for example asphalt shingles, it is permissible to re-roof with asphalt shingles, i.e., with the currently existing materials.

Guidelines for Foundations and Walls

a. Maintain historic foundations and exterior walls that contribute to the historic character of a building, including their functional and decorative features such as cornices, bays, piers and pediments.
b. Maintain and repair materials, details and features of foundations and exterior walls through appropriate industry standard methods.
c. If a portion of a foundation, exterior wall or feature is deteriorated beyond repair, replace with in-kind or imitative substitute building materials.
d. If replacement of an entire foundation, exterior wall, or feature is necessary, replace with in-kind or imitative substitute building materials.
e. It is generally inappropriate to introduce new features such as windows, doors, and vents to front elevation exterior walls. If new features are required, features should be installed on secondary elevations (rear or side elevations, or elevations that are not visible from the street) whenever possible.
f. When required, it is appropriate to remove and replace exterior wall materials or features including but not limited to panels, pediments, bargeboard and cornices with in-kind or imitative substitute building materials.
g. In-kind or imitative substitute materials may be used on exterior walls. Imitative substitute materials will simulate the dimensions and finish of the historical building materials.

Guidelines for Interiors

a. Where the existing interior floorplan has been previously altered and does not accommodate current technological, military, or quality of life, health, and safety requirements, floorplan alterations, reconfigurations, and use of in-kind or imitative substitute building materials in making those alternations or reconfigurations are acceptable when implemented in accordance with these Guidelines for Interiors.
b. Retain interior features that are important in defining the overall historic character of the building to the extent possible or replace with in-kind or imitative substitute building materials. Interior character-defining features are columns, cornices, baseboards, crown molding, fireplaces and mantels, stairs, and ceiling height. If interior features present a lead-based paint or other hazard, either encapsulate or remove the feature and replace with in-kind or imitative substitute building materials.
c. Retain wallpaper, plaster, and finishes such as stenciling, marbleizing, and graining, and other decorative materials to the extent possible. If such decorative finishes present a lead-based paint or other hazard, remove, and replace in-kind or with imitative substitute building materials if feasible. Plaster walls may be repaired and / or replaced with drywall.

d. Avoid installing dropped ceilings below ornamental ceilings or in rooms with high ceilings. If dropped ceilings are necessary, they should be installed in a manner set back from the windows, so they are not visible from the exterior and avoid damage to historic decorative features to the maximum extent possible.
e. Retain stairs in their historic configuration and location whenever possible. If a second means of egress is required, construct new stairs in secondary spaces if possible.
f. The installation of security features and fire suppression systems should be implemented in a manner to permit retention of character-defining features to the maximum extent possible.
g. Features of outdated or obsolete mechanical and electrical systems, such as radiators, vents, fans, grilles, plumbing fixtures, wiring, fuse boxes, switch plates, and lights may be removed. Consider retaining a representative example if feasible. Any damage resulting from systems removal will be repaired in accordance with these Guidelines.
h. If new heating, air conditioning, lighting and plumbing systems are installed, or if wood burning fireplaces are replaced with natural gas fireplaces, they should be done in a way that does not destroy character-defining features and finishes to the maximum extent possible. Ducts, pipes, and wiring should be installed as inconspicuously as possible, in secondary spaces, in the attic or basement if possible, or in closets if possible.
i. If a portion of an interior feature or finish is deteriorated beyond repair, it is appropriate to replace the damaged portion using imitative substitute building materials or in-kind historical building materials.
j. If replacement of an entire interior feature or finish is necessary, replace with in-kind or imitative substitute building materials. If interior doors require replacement for security purposes, replace with imitative substitute building materials where imitative substitute building materials meet security requirements.
k. It is inappropriate to apply new interior features and finishes where none currently exist.
l. Avoid removal of any character-defining historic interior feature in a primary interior space to the extent possible. If removal cannot be avoided replacement with imitative substitute building materials is acceptable. When retention of such historic features is not possible, the Army or Army housing partner will salvage and retain such historic features to the extent possible for preservation through reuse on other similar housing at that location.
m. Remove loose and damaged plaster and replace with either in-kind or imitative substitute building materials, replacement of plaster walls with drywall is appropriate.

Guidelines for Interior Structural Systems

a. Maintain historic character-defining visible interior structural systems and their features to the maximum extent possible through regular inspections and repair.
b. Repair original interior structural systems and their features either by augmenting or upgrading individual parts or features.
c. If an original structural system or feature requires replacement, replace with materials with similar functional characteristics.

d. Remove visible features of an interior structural system only when necessary when due to use requirements or other issues. Replace removed visible features or structural system with features or a structural system that meets functional requirements.
e. Design and install mechanical and electrical systems to minimize the alteration or damage to a structural system or feature. For example, limit the number of cutouts or holes in a structural member or feature to the maximum extent possible.
f. If a structural feature or system has been previously replaced, it is unnecessary to attempt to restore or recreate what is believed to be original features or systems.

Guidelines for Historic Designed Landscapes and Features

a. Maintain features of historic designed landscapes to the extent possible including but not limited to the relationship and spatial arrangement of the various components of the landscape, water features, circulation patterns, topography, vegetation, structures, site furnishings and objects. Avoid removing, obscuring or concealing such historic landscape features to the extent possible.
b. Maintain historic designed landscape features including but not limited to fountains, sculpture, site and street furnishings, monuments and gravestones, walkways, sidewalks, fences, walls, and hills, trenches and terraces to the extent possible. If all or a portion of a historic designed landscape feature requires replacement, it is appropriate to replace with in-kind materials or with imitative substitute building materials, where such materials are appropriate. Recreation of documented designed landscape features is not required. Installation of new fencing in historic housing areas to meet quality of life or other functional needs where none currently exists is allowable. Installation of new fencing or replacement of existing fencing is not subject to any specific design requirements or other criteria considering it is impermanent and removable. Repair and replace existing historic fencing with in-kind materials or imitative substitute building materials.
c. Maintain historic plant materials through appropriate methods to the extent possible. If replacement of historic plant materials is necessary, replace with the same or similar species where possible and practicable, or with selections from an installation's approved plant material list (if such a list is available). Removal of historic plant material may occur when there is a threat of or ongoing impacts to housing and infrastructure. It is acceptable to remove historic plant material, including non-native species that are not compatible with and impact significant climatic factors such as water availability.
d. If a portion of a historic landscape feature is deteriorated beyond repair, replace the damaged portion using in-kind historical materials or imitative substitute building materials, if financially or otherwise feasible.
e. Replacement of a documented historic landscape feature that is not currently existing is not required.

Guidelines for Historic Districts

a. Maintain historic views and view sheds into and out of historic buildings and historic districts including scenic vistas and open space to the maximum extent possible.

b. Retain the historic community plan of historic districts including but not limited to cultural or man-made features such as circulation systems, streetscapes and furnishings, designed landscapes, setbacks, and monuments and statues, as well as the natural features such as open space, wooded areas, rivers and landforms, to the maximum extent possible.

Guidelines for Circulation Systems and Paving Patterns

a. Maintain historic circulation patterns including but not limited to streets, sidewalks, alleyways, driveways, bridges and green space along with their features such as curbing, surface materials, orientation, and landscaping, to the maximum extent possible.
b. Maintain historic planting strips between the sidewalk and street as well as medians, and avoid paving over existing planting strips or medians, to the maximum extent possible.
c. If a portion of a historic circulation or paving pattern or feature is deteriorated, replacement with in-kind or imitative substitute building materials is appropriate.
d. Repaving existing paved streets, sidewalks, alleyways, driveways, and bridges is not subject to any specific design requirements or other criteria.

Guidelines for Associated Buildings and Structures

a. Maintain and repair historic associated buildings and structures and their features.
b. If a feature or element of a historic associated building or structure is deteriorated, replace the damaged portion with in-kind or imitative substitute building materials that match the original in size, design, and scale.
c. If a documented historically associated building or structure is missing entirely, it is unnecessary to replace it.
d. Avoid applying new features, where none currently exist to an associated building or structure to the maximum extent possible.
e. Design exterior changes to non-historic associated buildings or structures such as garages in a manner that preserves the character of the historic property and/or district in terms of the size, design and scale using in-kind building materials or imitative substitute building materials.
f. New storage sheds may be installed in back yards in a manner that limits visibility from the street to the maximum extent possible.

Guidelines for Force Protection

a. Comply with force protection standards in a manner that maintains character-defining interior and exterior spaces, materials, and features to the maximum extent possible.
b. Install force protection systems and equipment such as security systems, cameras and surveillance equipment, lighting and other equipment in a manner that maintains character-defining features and materials to the maximum extent possible.
c. If possible, locate small components of sensor and surveillance technologies under building eaves or inside light fixtures to minimize the impact to the historic fabric and visual impact of a building, district and associated buildings and structures, and landscape features.

d. Locate ventilation equipment or other force protection utilities on inconspicuous elevations, such as on the rear façade, to limit the visibility from the public right-of-way and, if possible, screen from view utilizing landscaping, fences or walls appropriate to the character of the historic building and/or district.
e. If possible, install new force protection measures such as security bars, grilles, and ventilation equipment in a reversible manner so that the system can be removed in the future with minimal damage to the historic building.
f. It is inappropriate to remove, conceal, damage or destroy historic materials, features and finishes of historic buildings or landscapes for force protection purposes unless it cannot otherwise be avoided. If interior alterations are necessary, contain alterations to secondary and other non-character-defining interior spaces if possible. If interior doors require removal and replacement for security purposes, replace with imitative substitute building materials if possible and where imitative substitute building materials meet security requirements. Historical interior doors that are removed should be salvaged for possible reuse.

Guidelines for Routine Maintenance

a. Routinely inspect the roof to ensure it is weather tight. Missing roofing materials should be replaced, and holes repaired according to methods in these guidelines. In-kind or imitative substitute building materials may be used for replacement and repairs.
b. Routinely inspect walls and foundations for insect and vermin infestation, moisture, cracks, deterioration and settlement. If problems occur, repair according to methods in these guidelines.
c. Routinely inspect the windows and doors to make sure they are operable and sealed properly to prevent water intrusion.
d. Routinely inspect potential points for water intrusion such as crawl space openings, foundations and basement windows to make sure water is being diverted away from the building.
e. Routinely inspect potential points for moisture intrusion such as masonry wicking in moisture, and condensation from poorly ventilated attics.
f. Gutter systems should be routinely cleaned and inspected to ensure they discharge water away from the building and do not leak.
g. Ensure that painted surfaces have a sound non-lead-based paint film, including but not limited to the following: walls, windows, doors, and architectural details.
h. Avoid painting or sealing unpainted masonry, glass or metal surfaces since this could accelerate deterioration.
i. Repair loose architectural features including but not limited to the following: brackets, rafters, pediments, cornices, balustrades, shutters, storm windows and doors, and siding, to the maximum extent possible.
j. Repair damaged structural features, such as masonry settling, eaves and porch posts in a timely manner before further structural damage occurs. In-kind or imitative substitute building materials may be used.

k. Vegetation around the historic property should be maintained and pruned back from the walls and foundations at least 12 inches. Remove ivy or other vegetation from walls and remove overhanging tree limbs and branches.
l. Remove trees and other vegetation when necessary to prevent gutter clogging, drainage issues, damage to infrastructure, or for safety purposes.
m. Mechanical, electrical and plumbing systems should be routinely inspected to make sure they are operating efficiency and correctly.

Guidelines for Emergency Repairs and Disasters

a. It is appropriate to make temporary repairs to pre-1919 housing. The repairs should be done in a manner that will cause minimal harm to the historic property where possible. Appropriate temporary repairs include the use of tarpaulins, plywood and bracing timbers to stabilize and secure the building. Make permanent repairs as soon as possible.
b. Remove standing water from basements and crawl spaces; however, ensure that pumping water will not collapse foundations when groundwater is high.
c. Remove all water-soaked materials including insulation, wall- board and wall coverings.
d. Air dry the building with ventilation. Avoid systems that pump in super-dry air.
e. Remove debris from and around the historic property including damaged trees and overhanging tree limbs.
f. Remove loose and damaged plaster and replace with in-kind or imitative substitute building materials, replacement of plaster with drywall is acceptable.
g. Clean and sanitize historic features using non-abrasive cleaners.
h. Features that are deteriorated or damaged beyond repair may be replaced with in-kind or imitative substitute building materials, replacing only the damaged portion if possible.

Guidelines for Mothballing

a. Ensure that roofs are weather tight by replacing missing shingles or tiles and repair openings in an accept- able method. In-kind or imitative substitutive building materials may be used for missing roofing materials.
b. Gutters should be cleaned and inspected to ensure they do not leak and that they discharge water away from the building. Additionally, potential points of water intrusion such as basement windows and crawlspaces should be inspected and blocked to divert water away from the building.
c. Walls and foundation should be inspected for deterioration and damage. Make appropriate repairs to prevent moisture and water penetration This includes repointing of masonry surfaces and repainting of wood siding.
d. Entry points should be sealed by closing door and window openings using infill materials such as plywood, corrugated panels and metal grates or grilles. The installation of infill materials should not damage door and window openings and associated building features such as sashes, doors and frames.
e. Exterior doors should be reinforced and secured. If the historic doors would be damaged by adding reinforcement, temporarily remove the doors and replace with secure modern doors. Store historic doors on site for reuse if possible.

f. Shut off water utilities to the building and drain the pipes.
g. If the building has monitoring and alarm devices such as fire suppression systems, fire alarms and security alarms, they should remain operational, especially functional sprinkler systems.
h. Disconnect all electrical systems not necessary for security, fire prevention and/or ventilation.
i. Loose architectural and structural features such as brackets, porch posts, balustrades and mantels should be repaired. If repair is not feasible, document, and remove the features. Inventory and store the features in a manner that prevents deterioration if the features can be reused.
j. Pest infestation should be exterminated and properly seal off their access to the building, which includes properly screening chimneys, vents, grills and louvers with a heavy-duty wire mesh and termite treatments.
k. The building should be adequately ventilated. This will vary depending on the building, the climate and the building's freeze-thaw cycle. Solutions range from the covering of small openings with heavy duty wire mesh to forced air ventilation in humid climates.

APPENDIX B: BUILDING MATERIALS GUIDELINES AND CATALOG FOR PRE-1919 ARMY HOUSING

The *Building Materials Guidelines and Catalog for Pre-1919 Army Housing* provides guidance for the application of the *Design Guidelines* and selection of appropriate building materials.

Using the Building Materials Catalog in Selecting In-Kind and Imitative Substitute Building Materials

The building materials selection procedure in section 8, the *Design Guidelines*, along with the *Building Materials Guidelines and Catalog* establishes a standard decision-making procedure and guidance, and a catalog for the selection of appropriate building materials for implementation of the *management actions* on pre-1919 housing. Where housing has been privatized, Army housing partners will implement the procedure using the information in appendices A and B.

Building Materials Guidelines and Catalog entries are provided for major components of the house design. Design considerations for each entry are derived from the design fundamentals of scale, mass, proportion, and materials to develop guidance for materials and component design that factor location, type, size, finish, and maintenance in their selection. Emphasis is placed on retention of the design integrity of the dwelling and surrounding district through a three-step process: identifying existing and/or historic applications; identifying design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and selecting in-kind or imitative substitute materials meeting the design considerations.

Building Materials Catalog Entries:

Foundations

The *Design Guidelines* for pre-1919 housing support the repair and maintenance of historic materials used in foundations, when appropriate. In cases where replacement of foundation materials is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size and finish of the historic building material are approaches authorized under the *Design Guidelines*.

Building foundations are the structural systems that support buildings. For the purposes of application of the *Design Guidelines,* foundations are limited to the elements of the foundation system that are visible at the base of a dwelling. These elements include exterior foundation cladding, piers, bulkheads, windows, and water tables.

The following discussion of treatments appropriate to the replacement of deteriorated foundations applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative substitute materials meeting the design considerations and *Design Guidelines*.

Historic Use in Pre-1919 Housing: Pre-1919 Army housing foundation systems are generally excavated systems. Exposed foundation walls typically found in include concrete, brick, stone, and stucco.

Design Considerations: Five major factors should be considered in the selection of in-kind and imitative substitute materials simulating exposed foundation materials and design elements: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district:

Location: The historic location and visibility of the work may be considerations in exterior foundation projects. Consider repair and/or replacement approaches that maintain the amount of foundation historically visible, particularly on elevations with the greatest prominence within the historic area. Select materials that simulate the historic foundation cladding type, when possible. The location of foundation features, such as bulkheads, windows and window wells, and exterior doors, should be retained, when possible, to maintain the design of the building and the pattern established by the standardized design of the housing area. Consider the location of necessary mechanical systems adjacent to secondary or rear elevations.

Type: Retain or replicate the type and materials of the historic foundation when possible. Consider design strategies that may visually maintain the appearance of the original foundation type should foundation alteration prove necessary. Consider the integration of new facing finishes, such as stone and brick that match historic stone and brick in type in foundation

projects. Consider the composition of historic concrete and stucco, which effects the material's visual character as well as permeability, density, and compressive strength. For example, concrete is composed of three ingredients: water, aggregate, and cement. Aggregate constitutes the majority of the concrete mix, up to 80 per cent by volume, and can be fine or course, ranging from sand to stone. Composition affects the visual characteristics of concrete. Consider matching those visual characteristics, when possible.

Size: Consider simulating the historic proportions of individual facing units and the height of the historically exposed foundation. For example, brick units should be repaired and/or replaced with units that simulate the width, length, and depth and coursing of the historic brick. Similar approaches should be considered in the selection of stone veneers, as possible.

Finish: Masonry, concrete, and stucco are materials that can be parged with a finish coat, painted, or left in their natural state. Simulating the color, texture, and reflective quality of the historic finish is recommended, when possible. Texture, such as rusticated or smooth finishes, can be the result of the manufacturing process or added during installation. Consider finishes that are comparable in color and type of finish with both the historic house design and with the surrounding historic district, where possible. In projects involving selective repair to exterior foundation walls, test patches of materials on less visible, secondary elevations should be considered, when possible, to assure their acceptability in the overall building design. Consider compatible mortar composition when repairing or replacing damaged mortar.

Design Maintenance: Foundations are vulnerable to moisture and structural or seismic movement. Cracking, spalling, water staining, mold, and unwanted vegetation can be symptoms of conditions that may affect the life expectancy of foundation projects and may compromise the appearance of the work over time. Water infiltration often is a contributing factor to appearance. Consider monitoring gutters, downspouts, flashing, and sprinklers regularly to encourage drainage away from the building to extend the installation appearance of foundation repairs and/or replacements.

Recommended Materials:

In-kind Repair and / or Replacement: In-kind replacement and repair of foundations is a treatment option identified in the *Design Guidelines*. In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 15 Preservation of Historic Concrete* and *Preservation Brief 22 The Preservation and Repair of Historic Stucco* particularly may be relevant to foundation projects.

Imitative Substitute Materials: Imitative substitute materials for repair and / or replacement of existing building components is a treatment option allowable under the *Design Guidelines* provided that the imitative materials are consistent with the *Design Guidelines* and

consistent with the design considerations identified for the building element. Further guidance can be found in *Preservation Brief 16: The Use of Substitute Materials on Historic Exteriors.* The following list provides examples of imitative substitute materials. This list is not intended to be comprehensive and is limited to the most common types of imitative substitute materials currently available. New materials and building products may be introduced in the future that meet the *Design Guidelines* and design considerations.

Manufactured Stone Veneer	Also known as architectural stone or veneer stone, manufactured stone veneer is an engineered product intended to look like natural stone. It is composed of a mixture of Portland cement, iron oxides, and aggregates. Manufactured stone veneer is light, uniform, and widely available. However, the color can fade over time and veneers are often brittle.
Veneer	Veneer is a thin layer of natural stone or brick typically applied over masonry or non-masonry surfaces. It is a durable product that often is less expensive than structural brick and stone.
Acrylic Stucco	Acrylic stucco, a synthetic stucco, is composed of acrylic resins and polymers. The material is designed to be applied over masonry or cement to replicate the texture and appearance of stucco. It is water-repellent, elastic, flexible, and durable. It is not prone to hair-line cracks or flaking. Acrylic stucco is produced with a variety of aggregates and custom textures. Acrylic stucco is produced with a range of colors and can be painted. Similar to traditional stucco, finish coats can be added. Acrylic stucco generally is more expensive than traditional, concrete-based stuccos. Acrylic stucco generally is not recommended for spot-repairs to historic stucco due to materials compatibility and aesthetic differences over time as materials age.
Masonry Block/Precast Stone	Precast stone, also known as masonry block, is a concrete product that is manufactured to simulate the appearance of natural stone. It can be customized to simulate the size and finish of historic units.
Precast Concrete Slab	Precast concrete slabs are molded concrete slabs, and in ideal conditions, fabricated off-site. The resulting product typically is stronger

	than slabs cast onsite because of variables such as weather and temperature. Precast slabs easily are installed and eliminate many labor costs associated with pouring concrete onsite.

Exterior Wood Cladding (Siding, Shakes, and Shingles)

The *Design Guidelines* support the repair and maintenance of historic materials used in exterior wall claddings, when appropriate. In cases where replacement of exterior wall cladding is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size, design, and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated exterior wood cladding applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative substitute materials meeting the design considerations and Design Guidelines.

Historic Use: Exterior wooden claddings historically were used in Army housing during the as a primary wall material, as the exterior cladding in wings and additions, and as claddings for support structures, such as garages.

Board Cladding: Wooden board cladding visually is defined by milling and installation. Wood siding can feature smooth or rusticated textures; the size and width of the boards can vary greatly. Frequently wood siding is painted or stained. Typical fabrication and characteristics include Tongue-and Groove (Flush and interlocked), Clapboard / beveled (thicker on one edge), and Board-and-batten (Vertical planks with narrower planks, battens, placed over the seams).

Shingles: Visually, shingles and shakes are differentiated through the method used to produce them. Shingles should not be replaced with units that are visually shakes and vice-versa. Shingles are smooth and sawn on both sides; finish of drop edge may be straight or curved. Shakes are sawn on one side, rough on one side.

Design Considerations: Five major factors should be considered in the selection of in-kind or imitative substitute materials simulating exterior wood cladding: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district:

Location: The historic use of wood siding in the overall house design and the visibility of the proposed work may be considerations in wood cladding replacement. Consider replacement installation limited to those areas of the building currently or historically finished in wood cladding. Particular care should be taken in selecting replacement materials for installation on primary elevations with the greatest visibility within the historic area.

Type: Cladding type often results in distinctive wall appearance. For example, drop siding features short runs of overlapping boards, tongue-and-groove siding comprises inter-connecting units that create a smooth surface, overlapping shingles create irregular wall textures. Replacement materials should be selected to simulate the type of historic cladding and to simulate the historic exterior wall appearance.

Size: The dimensions of the cladding type also are factors in the appearance of the exterior wall. Replacement cladding should approximate the overall height, width, and depth of the existing or historic fabric as closely as possible. Replacement that strives to replicate the dimensions of historic cladding, where possible, will contribute to the preservation of the overall design integrity of the individual house as well as maintain consistency within the historic district.

Finish: Pigment medium, texture, and reflective quality of finishes to exterior wood cladding can contribute to the visual character of the exterior building design and the historic district. Pigment mediums, including paint and stains, used in replacement should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible. The selection of paint or stain color should consider compatibility with the historic area. However, it is not necessary to utilize original colors that may have been determined through a chemical paint analysis. Elastomeric paints are designed to protect masonry surfaces and not appropriate for wooden elements.

Design Maintenance: The character of in-kind materials and imitative materials also may differ over time as the materials age. Selective replacement of deteriorated wooden cladding using imitative substitute materials may become more aesthetically apparent with time. Consider replacement strategies that limit or avoid the potential of unintended impacts to design integrity, when possible.

Recommended Materials:

In-kind Repair and / or Replacement: In-kind replacement of wood cladding is a treatment approach identified in the Design Guidelines. In-kind replacement of historic materials should be consistent with the Design Guidelines and design considerations identified for the element. Wood siding continues to be produced and is widely available. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 47 Maintaining the Exterior of Small and Medium Size Historic Buildings* particularly may be relevant to wood cladding.

Imitative Substitute Materials: Replacement of wood cladding with cladding fabricated in imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the Design Guidelines and design considerations. Further guidance on material selection and installation can be found in *Preservation Brief 16 The Use of Substitute Materials on Historic Exteriors* and *Preservation Brief 8 Aluminum and Vinyl Siding on Historic*

Buildings: The Appropriateness of Substitute Materials for Resurfacing Historic Wood Frame Buildings. The following list provides examples of imitative substitute materials for wood siding. Please note that the list of materials is anticipated to expand as new materials and products are introduced and become available.

Cellular Composite	Cellular composite siding is a comparatively new product on the market. Available for residential use for approximately a decade, it utilizes an interlocking installation system. The product is currently manufactured by less than five manufacturers; and, there is limited performance data on its durability over time.
Engineered Wood	Engineered wood is composed of compressed resin and wood chips. Generally, it is treated to protect against rot and termites; it does not rot. Additionally, it performs well under most weather conditions. The siding requires maintenance and painting.
Fiber Cement / Cementitious	Fiber cement is a cementitious material composed of cement, sand, water, and fiber. It is significantly heavier than other siding options making installation more difficult. Fiber cement requires periodic caulking between joints. Fiber cement can be textured to simulate natural wood and is generally factory finished. The material can be susceptible to chipping. It must be repainted approximately every 15 years.
Metal	Aluminum siding is light and easy to install. Aluminum siding requires regular maintenance and is prone to damage, denting, melting, warping, and expansion and contraction. Steel siding is considerably more durable, but heavier than its aluminum counterpart. Steel siding is susceptible to rust as well as similar damage as aluminum.
Vinyl	Vinyl is the most common imitative wood siding. It primarily is composed of polyvinyl chloride (PVC) resin. Vinyl is water resistant rather than waterproof and is subject to expansion and contraction with seasonal temperature changes. The benefits of vinyl are its wide availability, low price, versatility of color, texture, and size, familiarity, low maintenance, infrequent cleaning, and ease of installation. May be affected by extreme heat or

	cold.
Wood Composite	Wood composite is an innovative and environmentally friendly product. Composite typically is fabricated from a mixture of wood fiber, recycled plastic, and a binder. The materials are significantly lighter than wood; replicate wood grain, color or stain, and milling; and come in varying sizes and widths.

Exterior Masonry

The *Design Guidelines* support the repair and maintenance of historic materials used in exterior wall claddings, when appropriate. In cases where replacement of exterior wall cladding is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated exterior masonry cladding applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative substitute materials meeting the design considerations and *Design Guidelines*.

Historic Use: Historic masonry, defined in this section as brick, stone, and adobe typically was sourced locally during the Inter-War period. Masonry is composed of the masonry unit and the mortar and extends to all elevations. Generally, masonry is unpainted and can feature quoins and water tables. During the pre-1919 era stone masonry construction typically was solid, but stone veneer also can be present in some buildings. It commonly is rubble arranged in courses. Brick masonry typically features extruded brick with consistent composition and firing resulting in uniform units. The use of adobe brick is limited to housing in the southwest and includes site manufactured or commercial cast unstabilized adobe brick.

Design Considerations: Five major factors are suggested for consideration in the selection of in-kind historic materials or imitative substitute materials simulating exterior masonry cladding: location, type, size, finish, and design maintenance. Consideration of these factors will support maintenance of the overall historical and architectural character integrity of the building and the associated historic district, as appropriate:

Location: Exterior masonry can be a dominant design characteristic of dwellings and associated residential neighborhoods. Masonry frequently establishes the color palette and architectural rhythm of an area through standardized materials and standardized construction techniques. Consider the visibility of proposed improvements to both the house and to the neighborhood, as appropriate. Particular attention should be paid to the existing design of

primary elevations and those elevations with the greatest prominence. Maintain existing patterns of structural bays, where possible. Limit new masonry work to areas historically containing exposed masonry, as possible.

Type: Consider matching the appearance of historic masonry as closely as possible. Replace brick with brick and stone with stone. Consider the source and characteristics of the historic material, where possible. Local clay mixes often produced standardized bricks in distinctive colors due to their chemical composition. Simulating historic stone type in replacement projects often is aesthetically desirable in executing repair, replacement, or additions to masonry buildings. Consider simulating the method of installation as well as the type of masonry unit. Coursing type generally refers to how the stone or brick units are laid in a wall. Typically, stone masonry can be coursed or uncoursed ashlar or rubble. Stone historically was laid either in organized rows or courses; or laid in a random pattern. Each technique resulted in a unique wall pattern, which should be matched when possible. Bricks are laid in courses as either stretchers (lengthwise) or headers (widthwise). These courses are described as the brick bond. The most common bonds are running (all stretchers), common (running bond with intermittent courses of headers), and Flemish (alternating stretchers and headers). Brick bonds are decorative as well as structural. Brick bonding patterns are features of the historic wall that should be matched, if possible. Also consider simulating the mortar type, width, and profile of mortar joints uniting historic masonry units in the overall wall, as appropriate. Matching mortar type can prevent further damage by utilizing a compatible material. The type and size of mortar joint used in a masonry wall often is a design as well as a structural feature. Matching mortar profiles in projects, such as selective repointing, can contribute to projects that blend with the original wall.

Size: Consider the dimensions of the historic masonry units in repair and replacement projects. Replacement masonry should approximate the overall height, width, and depth of the existing units as closely as possible. Replacement that strives to replicate the dimensions of historic masonry units, where possible, will contribute to the preservation of the overall design integrity of the individual house as well as maintain consistency within the historic district.

Finish: Pigment medium, texture, and reflective quality of finishes of masonry cladding can contribute to the visual character of the exterior building design and the historic district. Mortar and masonry units have different finishes, both of which should be simulated, when repair or replacement become necessary. Wet, dried, and cured mortar produce different colors. Mortar joints, or the application or shape, may be concave, flush, beaded, weathered, extruded, vee, or raked. The color of brick is determined by the material and chemical compounds of which they are composed. Most commonly red bricks made primarily of sand, clay, and iron oxide are used in construction. Additionally, differently colored masonry units typically are used on the same building to create visual interest. Color can be used as a decorative element that is integral to the appearance of the building. Stone naturally occurs. The color can be specific to the quarry from where it was mined. However, typically, there is color variation within stones used on buildings. Additionally, buildings can be constructed with a range or selection of stone colors used with varying frequencies. Identify the color variation of masonry units and mortar before selecting in-kind or imitative substitute units that match historical patterns as closely as possible.

Design Maintenance: Historic masonry that is maintained in place should be repaired, replaced, and cleaned using methods that follow preservation guidance found in *The Secretary of the Interior's Standards for the Treatment of Historic Properties* and *Preservation Brief 2 Repointing Mortar Joints in Historic Masonry Buildings*. Matching historic walls in selective wall repair using imitative substitute masonry may pose challenges. Such challenges often lead to recladding full elevations. Consider how new in-kind and imitative substitute material will age over time. Differences between new and historic materials as they age can make acceptable finished work more obvious over time.

Recommended Materials:

In-kind Repair and / or Replacement: In-kind replacement of exterior masonry is a treatment approach identified in the *Design Guidelines*. In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 2 Repointing Mortar Joints in Historic Masonry Buildings* and *Preservation Brief 5 Preservation of Historic Adobe Buildings* are relevant to exterior masonry projects.

Imitative Substitute Materials: Replacement of exterior masonry with cladding fabricated in imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the *Design Guidelines* and design considerations. Further guidance can be found in *Preservation Brief 16 The Use of Substitute Materials on Historic Exteriors.* The following list provides examples of imitative substitute materials for masonry siding. However, there are limited imitative options available. Brick still is produced widely; stone also remains available. Please note that the list of materials is anticipated to expand as new materials and products are developed and become available.

Manufactured Stone Veneer	Also known as architectural stone or veneer stone, manufactured stone veneer is an engineered product intended to look like its natural counterpart. It is composed of a mixture of Portland cement, iron oxides, and aggregates. It is light, uniform, and widely available. However, the color may fade over time and the product is brittle.
Veneer	Veneer is a thin layer of natural stone, brick, or adobe bricks typically applied over a masonry or non-masonry surface. It is a durable product. Additionally, it is less expensive than brick, stone, or adobe.
Precast Stone, Stabilized adobe brick, Compressed adobe brick	Precast stone is a concrete product that is manufactured to simulate the appearance of

	natural stone. It can be customized to simulate the size and finish of historic units. Manufactured stabilized adobe brick is made from a mixture of water, coarse and fine sands, silt, clay and straw or animal hair as well as a stabilizing additive to provide extra protection against moisture and/or erosion and is used in lieu of unstabilized adobe brick. Compressed (or pressed) adobe brick is brick that has been mechanically pressed during manufacture. Caution should be exercised with the use of compressed adobe brick in the repair of buildings with unstabilized adobe brick. The high expansion rate of compressed bricks may lead to damage of unstabilized adobe brick.

Stucco Cladding

The *Design Guidelines* support the repair and maintenance of historic materials used in exterior wall claddings, when appropriate. In cases where replacement of exterior wall claddings is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size and finish of the historic building material, are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated exterior stucco cladding applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative substitute materials meeting the design considerations and *Design Guidelines*.

Historic Use: Stucco is composed of a mix of mud, clay, lime, chalk, cement, and gravel. The composition of stucco can be unique to the building to which it is applied. Historically, stucco is applied in layers directly onto a substrate such as structural tile or masonry in stucco walls and foundations. Stucco also was applied over wood or metal lath. Stucco acts as a sealant for the building envelope, and when applied correctly and maintained, protects against wind and water damage. The material is fire resistant. Stucco siding was utilized as a finish limited to single stories in multi-story dwelling and applied as a cladding for the entire building envelope.

Design Considerations: Five major factors should be considered in the selection of in-kind or imitative substitute materials simulating exterior stucco cladding: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district.

Location: Stucco exterior finishes often are character-defining design features in individual housing design and in residential historic areas. Consider maintaining areas of a building exterior that historically were finished in stucco with in-kind historic materials or with imitative substitute materials that will maintain the original design. Avoid the installation of stucco in areas where it was not historically used, when possible. Consider maintaining the original design for exterior wall finishes on visually prominent areas, such as facades, to maintain the historical and architectural character of the dwelling and associated historic neighborhood.

Type: Consider the composition of the historic stucco when repairing or installing imitative materials, as appropriate. Repairs using incompatible material may fail and can be visible despite appropriate installation. Consider consulting historic construction documents for historic stucco composition, when available. Composition also may be determined through the analysis of existing stucco.

Size: Stucco can include a fine or coarse grain substrate, which determine its texture. Fine-grain substrate results in a more plaster-like texture, while a courser grain results in a rougher finish. Consider matching existing stucco texture when consistent finish surfaces are desired.

Finish: Stucco finish coats and / or paint were applied to achieve the finish and color of the exterior surface. Consider simulating historic finishes, where possible. Historic stucco typically comprised three layers: the scratch, brown, and finish coats. Modern stucco generally is limited to one or two coats applied over fiber-reinforced stucco. The finish, top, coat provides the texture of the final stucco. Finish coats are determined by the tools used in application and can range from smooth to rusticated surfaces. Consider simulation of the historic finish in repair and/or replacement projects to achieve visual cohesion of the building's surface and within finishes found in the associated historic district.

Design Maintenance: Consider maintenance of existing stucco finishes using methods suggested in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings* and *Preservation Brief 22: The Preservation and Repair of Stucco*, when in-kind materials are project treatment options. Imitative substitute stucco materials include both "systems," such as multi-layer boards with a stucco-textured finish, and synthetic stucco. These imitative substitute materials generally are designed as whole-wall treatments for new wall construction. Matching existing wall appearance and imitative substitute materials can be challenging and differences between historic and imitative substitute materials may become visually obvious over time as the materials age. Consider finish coats or the addition of paint films to unify the aesthetic appearance of the wall, as appropriate.

Recommended Materials**:**

In-Kind Repair and / or Replacement: In-kind replacement of stucco cladding is a treatment approach identified in the *Design Guidelines.* In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the

element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 22 The Preservation and Repair of Historic Stucco* particularly may be relevant to exterior stucco projects. After 1900, most stucco in the United States was composed of Portland cement and lime (now gypsum). During the pre-1919 period, the typical stucco mix included: one-part Portland cement, two-and-a-half parts sand, lime totaling less than 15 per cent of the cement's volume, and enough water to make the mix workable. Generally, repair or replacement projects are limited to the area of damage. The root cause of damaged stucco typically is water infiltration or building movement. Damage and deterioration will continue to occur if water infiltration is not stopped. Monitor gutters and downspouts to assure that water is draining away from the surface of the building and that sprinklers and other watering systems are not spraying the building. These efforts can help prevent stucco damage and the unwanted growth of mold and vegetation. In buildings where stucco has been repeatedly replaced thereby creating a patchwork appearance, consider removing previous repairs prior to patching. Minor hairline cracks larger than .030 inches typically can be corrected with a thin skim coat of stucco. Caulk is not a long-term solution for material for repairs and generally, has a high failure rate. Stucco should be flush with the surrounding area and blended to be as seamless as possible. Consider using a compatible stucco mixture that simulates the density and porosity of the original material, when possible.

Imitative Substitute Materials: Replacement of stucco cladding with imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the Design Guidelines and design considerations. Further guidance can be found in *Preservation Brief 16 The Use of Substitute Materials on Historic Exteriors.* The following list provides examples of imitative substitute materials for stucco siding. Please note that the list of materials is anticipated to expand as new materials and products are introduced and become available.

Acrylic Stucco	Acrylic stucco, a synthetic stucco, is composed of acrylic resins and polymers. The material is designed to be applied over masonry or cement to replicate the texture and appearance of stucco. It is water-repellent, elastic, flexible, and durable. It is not prone to hair-line cracks or flaking. Acrylic stucco is produced with a variety of aggregates, and custom textures are available. Additionally, it is produced with a range of colors and shades. It can be painted. Like historic stucco, finish coats can be added during installation. Acrylic stucco can be applied over Exterior Insulation and Finish Systems (EIFS) to provide a customized finish. However, acrylic stucco generally is more expensive that traditional, concrete-based stuccos.

Exterior Insulation and Finish Systems	EIFS is a multi-layer system that has both face-sealed and drainable versions. The drainable version includes a water-resistant barrier, drainage plane, insulation, reinforced mesh, water-resistant coat, and a topcoat. The face-sealed version does not include the drainage plane. EIFS is a lightweight, waterproof, malleable, insulating, and inexpensive material. Without correct installation, water easily can be trapped between the layers of the material causing mold, rot, rust, and, ultimately, failure. This issue is compounded by installation over substrates, such as wood, that also trap moisture and using the face-sealed version. In the past 20 years, EIFS has been reengineered to include weep holes, which has abated earlier serious issues with moisture; however, care should be undertaken to insure proper installation. Acrylic or traditional stucco can be applied on top to provide a custom finish.
Elastomeric Paint	Elastomeric, or acrylic, paint can be applied to newly installed acrylic stucco, EIFS, or fiber cement boards. However, it has limited use on historic stucco and should not be applied. It is only appropriate to apply cement-, latex-, or oil-based paints to historic stucco.
Fiber Cement Board	Fiber cement is composed of cement, sand, and cellulose fibers. It is a customizable material that allows for the application of stucco over the board. A skim coat can be applied to match the surrounding historic stucco. Additionally, some cement boards are manufactured with a stucco finish and are pre-primed for painting. Fiber cement boards often are manufactured to be water resistant and insulating. Additionally, it is durable. However, it is heavy and difficult to cut. Acrylic or traditional stucco can be applied on top to provide a custom finish.

Roofing

The *Design Guidelines* support the repair and maintenance of historic materials used in roofs, when appropriate. Associated elements to roofing include eaves, valleys, drainage features, pediments, cornices, brackets, chimneys, and flashing details. In cases where replacement of roof sheathing is desirable or necessary, either the in-kind replacement of historic

materials or the installation of imitative materials that simulate the size and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated roof sheathing applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative materials meeting the design considerations and *Design Guidelines*.

Historic Use: Several types of roof sheathing historically was used in Army housing during the pre-1919 period including slate, clay tile, and metal. While roof form and material vary, associated elements tend to be limited to one or two historic materials. For example, historic drainage features such as gutters are most likely metal. Chimneys historically were clad in brick, concrete, or stucco.

Clay Tile: Clay tiles historically were produced by baking molded clay into tile. Installation includes pantiles, flat tiles, or field tiles. Pantiles are convex or rounded tiles, often grouped together generically as "pantiles". These include Spanish tiles (sometimes referred to as "S" tiles) or the similarly shaped Mission or "Barrel" tiles. Flat, shingle tiles can either be flat or interlock at the top and on one side. Although the interlock holds them together, most interlocking shingle tiles also have one or more holes near the top for nailing to the roof sheathing. Plain or flat tiles require nailing and are not interlocked. Field tiles are those covering the majority of the flat surface of the roof. Some roof shapes, such as towers or turrets, require tiles of varying sizes, and some shapes or patterns of field tiles also require specially shaped finish tiles to complete covering the roof.

Slate: Slate is a fine-grained, foliated, homogeneous metamorphic rock manufactured as a tiled roofing material. The mineral composition of slate will determine the color and weathering properties.

Metal: Sheets of lead and copper have been used for roofing since classical times. Usually, metal roofs are applied large sheets joined with standing seams to prevent leaks. In the early 19th century, sheet iron coated with zinc, tin, or lead to prevent rust came into use. Later in the 19th century stronger corrugated panels of iron became common.

Design Considerations: Five major factors should be considered in the selection of in-kind and imitative substitute materials simulating roof sheathing: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district:

Location: The historic use of roof sheathing in the overall house design and visibility of the proposed work are recommended considerations when choosing a suitable replacement material. Depending on material, it may be more feasible to replace an entire roof while, in some considerations, it may be more appropriate to replace only damaged shingles or tiles. Drainage

features, such as gutters, are recommended to follow a similar path and placement unless such patterns no longer provide functional use.

Type: Sheathing type often results in distinctive roofing appearances. For example, pantiles are installed to produce a “barrel” or “S” shape, while flat tiles are installed to create a smooth, flat surface. Replacement materials should be selected to simulate the type of historic sheathing and to simulate the historic roof appearance through shape, texture, color, and installation. Ensure the use of compatible fasteners.

Size: The dimensions of the roof tile or shingle, drainage feature, and decorative feature also are factors in the appearance of the roof. Replacement shingles or tiles should approximate the overall height, width, and depth of the existing or historic fabric as closely as possible. Replacement that strives to replicate the dimensions of historic shingles or tiles, where possible, will contribute to the preservation of the overall design integrity of the individual house as well as maintain consistency within the historic district. Decorative features such as cornices or pediments are recommended to retain similar size and dimensions to historic units. Drainage features, such as gutters, also are recommended to retain similar size and dimensions unless functional use requires them to be expanded.

Finish: Roof shingles or tiles may be naturally colored or textured or painted and glazed. Pigment medium, texture, and reflective quality of finishes of the shingles or tiles can contribute to the visual character of the building design and the historic district. Pigment mediums, including paint and glazes, used in replacement sheathing should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible. The selection of paint or natural-colored materials should consider compatibility with the historic area: both the dwelling roof and those of the historic district. It is important to remember asbestos shingles were designed as imitative substitute materials for slate and clay tile. Imitative substitute materials should simulate those slate or clay tile finishes. Decorative and drainage features are recommended to exhibit a similar texture, finish, and color as historic units. For example, replacing an historic copper gutter system with a white, vinyl gutter system will significantly alter the texture, color, and finish of the system and is not recommended.

Design Maintenance: When in-kind materials are selected as a treatment approach, consider roofing repair and replacement methods that follow preservation guidance found in the *Secretary of the Interior’s Guidelines for Rehabilitating Historic Buildings* and *Preservation Brief 29: The Repair, Replacement, and Maintenance of Historic Slate Roofs* and *Preservation Brief 30: The Preservation and Repair of Historic Clay Tile Roofs*. Consider selective repair of damaged units to prevent further failure, when possible. Consider stockpiling extra roofing used in repair or replacement projects for future work. Ready access to either in-kind or imitative materials used in earlier work can be cost efficient and assure materials match in future work.

Recommended Materials**:**

In-kind Repair and / or Replacement: In-kind replacement of roof sheathing is a treatment approach identified in the *Design Guidelines*. In-kind replacement of historic materials should be

consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 4 Roofing for Historic Buildings, Preservation Brief 19 The Repair and Replacement of Wood Shingle Roofs, Preservation Brief 29 The Repair, Replacement, and Maintenance of Historic Slate Roofs, and Preservation Brief 30 The Preservation and Repair of Historic Clay Tile Roofs* particularly may be relevant to roof projects.

Imitative Substitute Materials: Replacement of roof sheathing with sheathing fabricated in imitative substitute materials is an allowable treatment approach provided that the imitative material meets the Design Guidelines and design considerations. Further guidance can be found in *Preservation Brief 16 The Use of Substitute Materials on Historic Exteriors.* The following list provides examples of imitative substitute materials that may meet the Design Guidelines and design considerations for roofing. Please note that the list of materials is anticipated to expand as new materials and products are introduced and become available.

Tile	Composite tile provides the same look as traditional clay and concrete shingle tiles but are lightweight and are installed without the need for structural roof modifications. Composite tile can be installed in cold and warm weather climates with no risk of cracking due to weatherization.
Engineered Wood	Engineered wood to replace wood shingles is composed of compressed resin and wood chips; generally, it is treated to protect against rot and termites. It is significantly less expensive than traditional wood shingles and does not rot. Additionally, it performs well under most weather. However, it requires painting and upkeep of color.
Fiber Cement	Fiber cement is composed of cement, sand, water, and fiber. It is typically more expensive and significantly heavier than other options, making installation more difficult. Additionally, fiber cement requires periodic recaulking of joints. It must be repainted approximately every 15 years.
Asphalt Composition	Asphalt composition tiles are the most common roofing material in the United States. Usually, asphalt shingles are made of either fiberglass or organic recycled paper-based products mixed with asphalt, which is then covered with colored mineral granules. These shingles can be

	manufactured to imitate a variety of roofing tiles including slate. While the cost is relatively cheap, averaging seven to twelve dollars per square foot, the lifespan averages 20 years and the material requires regular maintenance. Architectural asphalt shingles are produced to better simulate the appearance of the historic material.
Plastic and Rubber Composites, Membrane	Plastic and synthetic rubber composites are plastics that are strengthened with fibers, fillers, particulates, powders, and other matrix reinforcements to provide improved strength or stiffness. Several manufacturers produce plastic and rubber composites that are marketed as synthetic slate roof tile that simulate weathered slate tiles. Membrane is generally used on flat or low-sloped roofs.
Resin	Resin is a flexible material that can be used in both interior and exterior molding. It is resistant to insects and moisture and does not warp, crack, or deteriorate. It can be molded in custom shapes, nailed, glued, sawn, or drilled. It typically is heavier than PVC or vinyl.
Metal	Metal roofs typically are composed of steel, aluminum, or copper sheets with a baked-on finish. The thicker the material, the longer the metal roof will last. Coatings can imitate historic materials such as shingle, clay tile, or slate. The material is durable and lightweight.

Porches

The *Design Guidelines* support the repair and maintenance of historic materials used in porches, when appropriate. In cases where replacement of exterior porch materials is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated porches applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative substitute materials meeting the design considerations and *Design Guidelines*.

Historic Use: Porches historically are a highly visible aesthetic building component of Inter-War housing. Architectural and design elements of porches generally were dictated by the dwelling's overall architectural style and, occasionally, geographical location. Common elements of porches include supports, railings, porch coverings, awnings, port-cochere, decking, and stairs.

Supports: Supports are vertical beams, posts, or columns that support porch roofs. Typically, an inner core of solid timber or steel provides the required support. Supports generally are clad in masonry (stone or brick) or may be a decorative wood beam.

Railings: Railings are a guard, serving both a function and aesthetic purpose, designed to prevent people from falling from raised porches. Typically, a railing includes a rail and railing cap, and posts. Railings generally are constructed of wood, iron, or masonry materials. Masonry railing may or may not include balusters.

Stairs: Stairs are a construction element designed to bridge a vertical distance by dividing it into smaller vertical distances called steps. Steps may be straight, round, or consist of two or more straight pieces connected at angles. Exterior entry stairs generally are constructed of brick, stone, or wood.

Design Considerations: Five major factors should be considered in the selection of in-kind and imitative substitute materials: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district:

Location: Consider the historic use and placement of porches in the overall house design and the visibility of the proposed replacement material. Consider limiting replacement to deteriorated areas of the porch, when possible. Consider the importance of the feature to the overall building design and the importance of the rhythm of identical porches to the neighborhood streetscape.

Type**:** Material type often results in distinctive characteristics and design elements. For example, a brick support column creates a distinct design, texture, and scale to the porch and dwelling. Replacement materials should be selected to simulate the type of historic materials used on the porch and replicate the porch's historic appearance as closely as possible.

Size: The dimensions of porch elements are factors that create the overall appearance of the entrance. Replacement materials should approximate the overall height, width, and depth of the existing historic elements as closely as possible. Projects that strive to replicate the overall porch design and the dimensions of historic elements, where possible, often are most successful in maintaining the historical and architectural character of the individual house and the associated historic district.

Finish: Color, texture, and reflective quality of finishes to porch materials contribute to the visual character of the exterior building design and historic district. Consider pigment

mediums, including paint and stains that simulate the finish medium, texture, and reflective quality of existing or historic materials, where possible. Consider paint or stain colors that are compatible with those used in the surrounding historic area. Porch elements that were not historically painted, such as stone or brick, should not be painted.

Design Maintenance: The character of in-kind materials and imitative substitute materials also may differ over time from the original units as the materials age. Selective replacement of deteriorated brick, stone, cement, or wood elements using imitative materials may become more aesthetically apparent over time due to the speed at-which the material ages. Consider replacement strategies that limit or avoid the potential of unintended impacts to design integrity, when possible.

Recommended Materials:

In-Kind Repair and / or Replacement: In-kind replacement of porch elements is a treatment approach identified in the *Design Guidelines*. In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 45 Preserving Historic Wood Porches* particularly may be relevant to porch projects.

Imitative Substitute Materials: Replacement of porches and elements with imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the *Design Guidelines* and design considerations. Further guidance can be found in *Preservation Brief 16 The Use of Substitute Materials on Historic Exteriors.* The following list provides examples of imitative substitute materials. Please note that the list of materials is anticipated to expand as new materials and products become available.

Vinyl	Vinyl column, railing, and balustrade units typically are an inexpensive imitative substitute material—about half the price of the wooden equivalent. However, vinyl is susceptible to size changes due to heat. Elements very in quality and durability. Vinyl can have a shiny "plastic" appearance that may not be appropriate in certain circumstances.
Manufactured Stone	Manufactured stone veneer is an engineered product intended to look like its natural counterpart. It is composed of a mixture of Portland cement, iron oxides, and aggregates. It is light, uniform, and widely available. The material is brittle and susceptible to color

	fading over time.
Veneer	Veneer is a thin layer of natural stone or brick typically applied over a masonry or non-masonry surface. It is a durable product and typically less expensive than brick and stone.
Fiber Cement Board	Fiber cement is composed of cement, sand, and cellulose fibers. It is a customizable material that allows for the application of stucco over the board. A finish, skim, coat can be applied to match the surrounding historic stucco. Some cement boards are manufactured with a stucco finish and are pre-primed for painting. Additionally, acrylic or traditional stucco can be applied on top to provide a custom finish. Fiber cement boards often are manufactured to be water resistant and insulating and retain high durability. However, the material is heavy and difficult to cut.
Fiberglass	Fiberglass is a durable and low maintenance reinforced plastic material that is composed of a woven material embedded with glass fibers laid across each other and held together with a binding substance. Railing and columns are manufactured using fiberglass and often are produced to simulate historic materials such as metals or wood. May expand and contract with extreme heat and cold.
Aluminum	Aluminum is a light, durable, and functional metallic material. The cost-effective material often is used in construction as it is long-lasting and does not require dedicated maintenance. Railing and columns are manufactured using aluminum and may include detailed elements to simulate wood carvings.
Molded Plastic	Molded plastic is an affordable and durable material manufactured for use as columns and railings. As the name suggests, plastic is molded to simulate carvings and detail elements in wood columns and railings.
Resin	Resin is a flexible material that can be used in both interior and exterior molding. It is

	resistant to insects and moisture and does not warp, crack, or deteriorate. It can be molded in custom shapes, nailed, glued, sawn, or drilled. It is heavier than PVC or vinyl.

Window Bays

The *Design Guidelines* support the repair and maintenance of historic materials used in window bays, when appropriate. In cases where replacement of window bays or their component parts is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size, design, and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated window bays applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 2) Select in-kind or imitative substitute materials meeting the design considerations and *Design Guidelines*.

Historic Use: Window bays include the sash, glass, surrounds, lintels and sills, storm or screen windows, and shutters. Some windows include decorative features such as leaded or stained glass. Window bays typically are located on all elevations and in dormers. They can vary greatly in size within one building; however, the type and variation of windows typically are consistent throughout a historic district. Window bays of varying design are found on all pre-1919 housing, with multi-light, double-hung, wood-sash windows being the most common. Window replacement is a common modification to the housing inventory. Later window modifications include the installation of modern vinyl replacement units.

Design Considerations: Five major factors should be considered in the selection of in-kind or imitative substitute materials simulating windows: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district:

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Location: Windows influence both the visual design quality and functionality of a dwelling. Interior light, ventilation, and architectural style were considered in the development of house plans. Consider retaining historic patterns of structural bay openings in window projects to maintain the historical and architectural character of the building, when possible. Avoid infilling existing bays, when possible, and limit structural modifications to less visible rear and secondary elevations. Replacement window units should match the design of historic units as closely as possible. Consider establishing a standardized replacement design for all buildings historically constructed from the same standardized design to maintain the architectural character of the housing area.

Type: Windows are defined by both their sash and light arrangement. Common configurations include six-over-six, nine-over-nine, and one-over-one. Match window types in sash and light arrangement as closely as possible. Consider storm or screen windows that do not obscure the window design. Consider maintaining or simulating historic window features such as surrounds and transoms.

Size: The dimensions of the window bays include the overall height, width, and depth of the existing or historic fabric. Replacement units that strive to simulate the dimensions of historic window bays, where possible, will contribute to the preservation of the overall design integrity of the individual house as well as maintain consistency within the historic district. Avoid the infill of structural window bays to accommodate units of smaller size when at all possible.

Finish: Pigment medium, texture, and reflective quality of window bay finishes are determined by their material. The finish can contribute to the visual character of the exterior building design and the historic district. Pigment mediums, including paint and stains, used in replacement should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible. The selection of paint or stain color should consider compatibility with the historic area. However, it is not necessary to utilize original colors that may have been determined through a chemical paint analysis.

Design Maintenance: Wood and aluminum age differently than many imitative substitute materials. Selective replacement of window units and trim on an elevation may become more obvious over time.

Recommended Materials**:**

In-Kind Repair and / or Replacement: In-kind replacement of window bays is a treatment approach identified in the *Design Guidelines*. In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series, *Preservation Brief 9 The Repair of Historic Wooden Windows*.

Imitative Substitute Materials: Replacement of window units and trim with imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the *Design Guidelines* and design considerations. Further guidance can be found in *Preservation Brief 16 The Use of Substitute Materials on Historic Exteriors.* The following list provides examples of imitative substitute materials for window bays. Please note that the list of materials is anticipated to expand as new materials and products become available.

Vinyl	Vinyl windows typically are the least expensive imitative material—about half the price of the wooden equivalent. Vinyl units can be energy-efficient and well insulated.

	The sash is very durable; frequently, the muntins and mullions are integrated between two panes of glass, which prevents damage to what typically is a delicate member. Vinyl is susceptible to expansion due to heat.
Fiberglass	Fiberglass windows, like vinyl, are lighter than wood; however, fiberglass has the added benefit of stiffness, which allows for a thinner unit. The windows are temperature stable and do not expand or contract, which helps prevent water infiltration. Units can be coated in wood veneer to better simulate the natural material and can be used as replacement for architectural features. Fiberglass windows approximately are 25 per cent more expensive than vinyl units. Fiberglass may fade over time.
Aluminum	Aluminum windows still are produced and can be substituted for historic wooden units or an in-kind replacement for aluminum. Aluminum windows can be clad in wood and painted to simulate the appearance of wooden units. Aluminum units are produced in many different sizes and styles. However, the units can be expensive, can corrode, and are not as widely available as other substitutive materials.
Resin	Resin is a flexible material that can be used in both interior and exterior molding. It is resistant to insects and moisture and does not warp, crack, or deteriorate. It can be molded in custom shapes, nailed, glued, sawn, or drilled. It typically is heavier than PVC or vinyl.

Exterior Entries

The *Design Guidelines* support the repair and maintenance of historic entries. In cases where replacement of entries is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative materials that simulate the size, design, and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated exterior entries applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size,

finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative materials meeting the design considerations and *Design Guidelines*.

Historic Use: Entry units include doors, storm doors, screen doors, transoms, sidelights, fanlights, trim, thresholds, hardware, and surrounds. Historically, wood panel doors were installed at the entrance of pre-1919 family housing. Wooden doors have been retained at installations across the United States. Metal units, such as steel and aluminum, also are present.

Design Considerations: Five major factors should be considered in the selection of in-kind or imitative substitute materials simulating entries: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district:

Location: Entrances are a major character-defining feature in the design of historic housing. Main entries are of particular importance to the design character of Army housing and often are the focus of architectural ornamentation that contributes to the architectural style of the housing unit. Original entry bays and associated architectural elements should be maintained when possible. Consider limiting entry modifications to rear and secondary elevations to maintain the architectural character of the main elevation and associated streetscape.

Type: Doors are classified by whether or not they contain panels or glazing and if they are single- or double-leaf. Panels and glazing are decorative elements common to doors. The number of leafs typically dictates the size of the opening. If door replacement becomes necessary, consider simulating the historic unit, including panels, glazing, and number of leaves, as closely as possible. Avoid entry units that include elements that were not part of historic units, as appropriate. Consider storm or screen doors that do not obscure the appearance of the entry. Maintain sidelights, transoms, and fanlights, where possible as well as the pattern of door glazing or panels.

Size: The dimensions of entries also are factors in the appearance of the exterior wall. Replacement entries and doors should approximate the overall height, width, and depth of the existing or historic fabric as closely as possible. Replacement that strives to replicate the dimensions of the historic entry, where possible, will contribute to the preservation of the overall design integrity of the individual house as well as maintain consistency within the historic district.

Finish: Pigment medium, texture, and reflective quality of finishes to entries can contribute to the visual character of the exterior building design and the historic district. Pigment mediums, including paint and stains, used in replacement materials should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible. The selection of paint or stain color should consider compatibility with the historic area.

Design Maintenance: Wood and aluminum can age differently than imitative substitute materials. In cases where the replacement of entry elements with imitative substitute materials is

required, consider replacement of the complete element to avoid obvious visual differences over time.

Recommended Materials:

In-Kind Repair and / or Replacement: In-kind replacement and repair of entries is a treatment approach identified in the *Design Guidelines.* In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*.

Imitative Substitute Material: Replacement of entries with imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the *Design Guidelines* and design considerations. Further guidance can be found in *Preservation Brief 16 The Use of Substitute Materials on Historic Exteriors.* The following list provides examples of imitative substitute materials for entries. Please note that the list of materials is anticipated to expand as new materials and products become available.

Vinyl	Vinyl doors and architectural features typically are the least expensive imitative material—about half the price of the wooden equivalent. However, vinyl is susceptible to size changes due to heat. Typically, vinyl doors are sliding glass units.
Fiberglass	Fiberglass doors, like vinyl, are lighter than wood; however, fiberglass has the added benefit of durability and an insulated core. Units can be coated in wood veneer to better simulate the natural material. Fiberglass doors approximately are 25 per cent less expensive than vinyl units. Fiberglass tends to fade.
Metal	Aluminum and steel doors can be substituted for historic wooden units or an in-kind replacement for aluminum. Units can be hollow-core or solid-core. Most metal doors can be clad in wood to simulate the appearance of wooden units and are produced in many different sizes and styles. However, the units can be expensive and can corrode.
Resin	Resin is a flexible material that can be used in both interior and exterior molding. It is resistant to insects and moisture and does not warp, crack, or deteriorate. It can be molded in custom shapes, nailed, glued, sawn, or drilled. It typically is heavier than PVC or vinyl.

Designed Landscapes and Features

The *Design Guidelines* support the repair and maintenance of historic materials used in designed landscapes and circulation features, when appropriate. In cases where replacement of designed landscaping features is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the species, size, or finish of the historic material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of landscape design features applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative materials meeting the design considerations and *Design Guidelines*.

Historic Use: Designed landscapes and features historically served as aesthetic and functional site features that unify Army housing areas and connected them to larger installations during the pre-1919 period. Built features, such as lighting, fencing, hardscape and street furniture, may reflect the dominant architectural styles of the installation. Site designs for Army housing areas often were influenced by contemporary designs of the period and may have included street plans, building setbacks, sidewalks, and street trees. Plantings were specific to geography and climate.

Design Considerations: Five major factors should be considered in the selection of replacement materials or species in / for designed landscape features: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the setting the building and the associated historic district:

Location: The historic design of residential landscapes, circulation patterns, setbacks, plant materials, and communal landscapes contribute to the residential qualities of the family housing. Historic site and landscape designs often complement building designs. Consider the spatial divisions established in historic plans. These designs should be respected, where possible, to maintain the historic and architectural character of the housing area. Consider replacement elements that simulate historic designs and placement, where possible. Consider replacement plant materials from the approved installation list that are the same species as the original, if possible, and planted following the historic landscape plans.

Type: Landscape type often results in distinctive residential streetscapes and environments. Historic landscape design uses plantings and built structures to enhance residential areas. The history of landscape design follows a progression similar to that seen in architectural design. Site and landscape designs were influenced by dominant styles in the field, regional designs, and the historic housing program that emphasized standardization and suburban standards. Consider defining the historic design influences of the housing area and designing improvement projects consistent with earlier designs, as possible. Replacement materials should

be selected that are similar in type to historic designs to simulate the historic appearance, when possible.

Size: The dimensions and spacing of landscape features are factors affecting the overall streetscape. Replacement materials should approximate the overall height, width, depth, and spacing of the existing or historic elements as closely as possible. Replacement that strives to replicate the placement and spacing of historic landscape design, where possible, will contribute to the preservation of the overall design integrity of the dwelling and historic district.

Finish: Materials utilized in landscape features such as fencing, pathways, and gazebos may have pigment medium, texture, and reflective quality of finishes which contribute to visual character of the landscape design and the historic district. Pigment mediums, including paint and stains, used in replacement should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible. The selection of paint or stain color should consider compatibility with the historic area. However, it is unnecessary to utilize original colors that may have been determined through a chemical paint analysis.

Design Maintenance: The character of in-kind materials and imitative substitute materials may differ over time as the materials age. Consider the aesthetic differences that may become apparent over time in materials selection and maintenance protocols, when possible. Consider replacement strategies that limit or avoid the potential of unintended impacts to design integrity, when possible.

Recommended Materials:

In-Kind Repair and / or Replacement: In-kind replacement of landscape design features is a treatment approach identified in the *Design Guidelines*. In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the element. It may not be possible to source plant, materials that exactly match the historic species or material. Further, there also may be species or historic placements that are not appropriate to maintain or simulate in the modern era. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings* and the *Secretary of the Interior's Guidelines for the Treatment of Cultural Landscapes*. State Historic Preservation Offices (SHPO) may also have guidelines regarding historic plant species. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 36 Protecting Cultural Landscapes - Planning, Treatment and Management of Historic Landscapes* particularly may be relevant to landscape and feature projects.

Imitative Substitute Material: Replacement of landscape features is an allowable treatment approach provided that the imitative substitute material meets the Design Guidelines and design considerations. The following list provides examples of imitative substitute for designed landscapes and landscape features. Please note that the list of materials is anticipated to expand as new materials and products become available.

Vinyl	Vinyl is an inexpensive imitative substitute material that can be used as a replacement for wood units (gazebos and bridges). Vinyl units can be finished with woodgrain to give the appearance of a wooden unit. Further, vinyl often is manufactured in a variety of sizes and dimensions to simulate historical units. However, vinyl is susceptible to size changes due to heat. While vinyl may be used to simulate wood fencing, the reflective quality and texture often noticeably differs from historic wood units.
Fiberglass	Fiberglass is a durable and low maintenance reinforced plastic material which is composed of a woven material which is embedded with glass fibers laid across each other and held together with a binding substance. Components for fencing, bridges, gazebos, and other built landscape features are manufactured using fiberglass and often are produced to simulate historic materials such as metals or wood.
Engineered Wood	Engineered wood is composed of compressed resin and wood chips. Generally, it is treated to protect against rot and termites; it does not rot. Additionally, it performs well under most weather conditions. Engineered wood may be used to simulate built wood materials and objects such as fences, bridges, and gazebos. The material requires maintenance and painting.
Aluminum	Aluminum units are available for fencing and bridges. Aluminum units generally have a metallic finish and likely will require paint to simulate historic units. Aluminum units are produced in many different sizes and styles. However, the units can be expensive, can corrode, and are not as widely available as other imitative substitute materials.
Manufactured Stone	Manufactured stone veneer is an engineered product intended to look like its natural counterpart. It is composed of a mixture of Portland cement, iron oxides, and aggregates. It is light, uniform, and widely available. The material is brittle and susceptible to color finding over time.

Veneer	Veneer is a thin layer of natural stone or brick typically applied over a non-masonry surface. It is a durable product and typically less expensive than brick and stone.
Xeriscape	Xeriscaping not a product, rather it is a form of drought tolerant landscaping made up of plants that need less irrigation than standard landscaping plants. Xeriscaping often takes the form of shrubs separated by mulch, small grassy areas and decorative stone pathways Xeriscaping typically involves limited or no turfgrass. Xeriscaping may be an option for enclosed backyards as long as drought tolerant plant species and placement do not deviate greatly or alter historic housing elements.
Resin	Resin is a flexible material that can be used in both interior and exterior molding. It is resistant to insects and moisture and does not warp, crack, or deteriorate. It can be molded in custom shapes, nailed, glued, sawn, or drilled. It typically is heavier than PVC or vinyl.

Interior Walls and Ceilings

The *Design Guidelines* support the repair and maintenance of historic materials used in ceilings and interior walls, when appropriate. In cases where replacement of ceilings and interior walls is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated ceilings and walls applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative substitute materials meeting the design considerations and *Design Guidelines*.

Historic Use: The majority of ceilings and interior walls in pre-1919 housing were lath and plaster. These materials are no longer popular in modern construction for standardized housing. Plaster easily can crack and may require specialized repairs. Plaster typically was painted, wallpapered, or decoratively finished. Other materials that potentially were used as interior wall finishes include ceramic or concrete tile and wood paneling.

Design Considerations: Five major factors should be considered in the selection of in-kind or imitative substitute materials simulating interior ceilings and walls: location, type, size,

finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district.

Location: The *Design Guidelines* discourages altering historic ceiling heights through the installation of drop ceilings unless necessary. If drop ceilings are considered, they should be installed in a manner that minimizes damage to the historic ceiling when possible. The *Design Guidelines* also recognize that reconfiguration of interior plans may be necessary. Consider focusing reconfigurations in secondary living areas and maintaining historic plans in formal, public spaces, when possible.

Type: When possible, match the historic type of wall finish in improvement projects. When ceiling and wall materials require replacement, consider in-kind or imitative substitute materials with surface finishes that simulates the historic surface.

Size: It is recommended that replacement materials simulate the size of the historic unit. It is recommended that the height, depth, and width of existing ceilings and walls be maintained, where possible.

Finish: Pigment medium, texture, and reflective quality of finishes to interior ceilings and walls can contribute to visual character of the exterior building design and the historic district. Pigment mediums, including paint and stains, used in replacement should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible.

Design Maintenance: Cracks in plaster typically can be repaired with a skim coat of plaster. Larger repairs should be completed in-kind or with an imitative substitute material such as drywall. Plaster and drywall patches can blend into the historic material. Aesthetically acceptable replacement of individual tiles and wood panels with imitative materials can be challenging. Consider the compatibility of historic and imitative substitute materials in materials selection. Repairs may fail or become more obvious as materials age.

Recommended Materials:

In-Kind Repair and / or Replacement: In-kind replacement of ceilings and walls is a treatment approach identified in the *Design Guidelines*. In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 21 Repairing Historic Flat Plaster—Walls and Ceilings, Preservation Brief 28 Painting Historic Interior,* and *Preservation Brief 18 Rehabilitating Interiors in Historic Buildings* particularly may be relevant to interior wall and ceiling projects.

Imitative Substitute Materials: Replacement of interior ceilings and walls with imitative substitute materials is recognized treatment approach provided that the imitative substitute material meets the *Design Guidelines* and design considerations. The following list provides

examples of imitative substitute materials for interior ceilings and walls. Please note that the list of materials is anticipated to expand as new materials and products become available.

Drywall	Drywall is a commonly used material composed of gypsum. It can be easily and quickly cut and installed, and moisture- and mold-resistant options are available. Drywall is significantly less expensive than plaster.
Veneer Wood	Veneer wood is a thin layer of natural wood that can be applied over a surface. It is an inexpensive option for simulating wood paneling and easily can be installed over an existing material.
Patching Compounds	Patching compounds are formulated for plaster and drywall and aid in the repair of patches and cracks. The compound can be premixed or dry. It can be applied over the affected area once debris is removed, taped, skimmed, and sanded once dry, or it can be used to skim cracks.

Flooring

The *Design Guidelines* for interiors support the repair and maintenance of deteriorated historic materials used in interior flooring when appropriate. In cases where replacement of interior flooring is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated interior flooring applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative substitute materials meeting the design considerations and *Design Guidelines*.

Historic Use: The types of flooring utilized in pre-1919 housing generally included wood and tile. Wood was the most frequently used flooring in pre-1919 housing across the United States and can be found throughout the interior of houses. Tile, particularly ceramic tile, frequently was used in bathrooms due to its water resistance.

Design Considerations: Five major factors should be considered in the selection of in-kind or imitative substitute materials simulating flooring: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district:

Location: Flooring materials often differed depending on the historic room use within the dwelling. For example, tile typically is in the bathroom while wood is in bedrooms, living rooms, and dining rooms. The hierarchy of flooring by room should be maintained, as possible.

Type: Match historic flooring type, where possible. Maintain decorative installation, such as parquet, inlays, and borders, where possible. Consider the difference in seasonal expansion and contraction rates between historic flooring and imitative substitute materials in selecting materials for repair.

Size: Match the dimensions of flooring units to maintain the historical visual characteristics of the interior. For example, replacement tile units should simulate the historic size and dimensions to greatest extent possible. Match the size of historic standardized wood flooring in width and length, when possible.

Finish: The finish of the surface is determined by color and reflective qualities. These qualities typically are achieved through the application of paint, dye, or stain, glazes, and varnish. It is recommended that the color of historic surfaces be maintained or simulated as closely as possible, including historic paint schemes or stains. It is recommended that replacement or repair units simulate the historic visual composition of the material. It is recommended that the physical texture of a historic unit be simulated by the imitative substitute unit. Examples of texture include wood grain, beveled tiles, or textured glazes. Consider refinishing wood flooring finishes for the room following repair to achieve a consistent finish.

Design Maintenance: Tile and wood can develop hair-line cracks or chips. Typically, these materials can be patched. However, individual units of tile may require replacement if they become loose or present a hazard to residents. Replacing individual units is appropriate if done with imitative substitute or in-kind units that simulate the design criteria. Monitor the seasonal expansion and contraction rates of historic flooring and repairs for evidence of incompatibility that may result in buckling.

Recommended Materials**:**

In-Kind Repair and / or Replacement: In-kind replacement of deteriorated interior flooring is a treatment approach identified in the Design Guidelines. In-kind replacement of historic materials should be consistent with the Design Guidelines and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 40 Preserving Historic Ceramic Tile Floors* and *Preservation Brief 18 Rehabilitating Interiors in Historic Buildings* particularly may be relevant to interior flooring projects.

Imitative Substitute Materials: Replacement of interior flooring with imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the Design Guidelines and design considerations. The following list provides examples of

imitative substitute materials for flooring. Please note that the list of materials is anticipated to expand as new materials and products become available.

Laminate	Laminate is composed of 99 per cent wood high-density fiberboards laminated together with a photographic layer imitating wood planks or tile on top. The material is engineered to simulate the appearance and texture of traditional, natural wood flooring. It is a durable and scratch-resistant material. However, some types may scratch more easily. Installation utilizes interlocking edges and can be done quickly. The material is softer than vinyl and is considered a more pleasant material to walk on. However, it is not recommended for use in bathrooms because it is not water-resistant.
Vinyl and Luxury Vinyl	Vinyl and luxury vinyl flooring is a wood plastic and polymer material; most vinyl options are waterproof. Vinyl can imitate wood, tile, or terrazzo. Rigid core and luxury vinyl are durable materials that simulate the appearance of traditional, natural wood, stone, and tile. Vinyl flooring can be applied directly over other flooring and has a more rigid feeling than laminate. Although more durable, vinyl typically is more expensive than laminate flooring. Installation uses interlocking edges and can be done quickly.
Engineered Wood	Engineered wood is composed of thin layers of wood and adhesives. In comparison to natural wood, it is less susceptible to humidity and expansion. When installed correctly, it can be as durable as natural wood. However, it dents easily and is not as durable as other imitative options. Engineered wood can be refinished a limited number of times.
Linoleum Flooring	Linoleum flooring is composed of wood and linseed oil and can replicate wood, tile, and terrazzo. It is durable and typically lasts twice as long as vinyl flooring. However, it can fade over time. It is inexpensive, but difficult to install properly. Floors can be polished at least once a year to extend its lifespan.

Porcelain Tile Flooring	Porcelain tile flooring can withstand scratches, dents, moisture, and stains. However, porcelain installation can be difficult. Installation requires a perfectly smooth subfloor, or the tile and grout can crack. Porcelain tile tends to be an expensive product that is difficult to repair or replace. The tiles can imitate wood, tile, and terrazzo.

Interior Features

The *Design Guidelines* for interiors support the repair and maintenance of deteriorated historic materials used in interior features such as staircases, mantels built-ins, and trim, when appropriate. In cases where replacement of these interior features is desirable or necessary, either in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of interior features applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative materials meeting the design considerations and *Design Guidelines*.

Historic Use: Interior features, such as staircases, mantels, built-in, and woodwork, historically were found in Army housing constructed during the pre-1919 period. Interior features historically were made of wood, though examples of plaster trim, such as cornices and cove moldings, also survive.

Design Considerations: Five major factors should be considered in the selection of replacement materials simulating interior features: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building:

Location: Historic interior features such as stairs, built-ins, mantels, and trim, contribute to the architectural character of the building and should be retained when possible. Stairs and built-in units historically were designed to fit in specific footprints in the floorplan and placement often followed a design hierarchy with the most elaborate elements located in the most formal and public spaces. Trim historically was installed for aesthetics. Consider focusing replacement installations to those areas of the building currently or historically designed for interior features. Consider retaining or relocating features in plans for interior reconfiguration, as possible.

Type: Staircases and built-in units serve function and aesthetic purposes. Staircases, mantels, built-ins, and trim should retain their design and function, as possible. For example, avoid the enclosure of historically open staircases, where possible. Replacement materials should be selected to simulate the historic appearance of the element. Consider matching the level of architectural elaboration historically found in housing feature and avoid the selection of overly ornate features that may be out of character with historic design.

Size: Dimensions of interior features should be maintained, as appropriate. Replacement units should approximate the overall height, width, and depth of the existing or historic fabric as closely as possible. Profile, ornamentation, and unique designs also should be simulated, as necessary. Replacement that strives to replicate the dimensions of historic units, where possible, will contribute to the preservation of the overall design integrity of the individual house. Avoid simplifying the feature through removal of moldings, where possible.

Finish: Pigment medium, texture, and reflective quality of finishes to interior fixtures can contribute to visual character interior. Pigment mediums, including paint and stains, used in replacement units should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible. The selection of paint or stain color should consider compatibility with the historic design; painting a surface that historically was not painted is not recommended.

Design Maintenance: The character of in-kind materials and imitative materials also may differ over time as the materials age. Selective replacement of deteriorated wooden built-ins or plaster trim using imitative substitute materials may become more aesthetically apparent with time. Consider replacement strategies that limit or avoid the potential of unintended impacts to design integrity, when possible.

Recommended Materials:

In-Kind Repair and / or Replacement: In-kind replacement of deteriorated stair, built-in units, or trim, is a treatment approach identified in the Design Guidelines. In-kind replacement of historic materials should be consistent with the Design Guidelines and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *Preservation Brief 17 Architectural Character—Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character* and *Preservation Brief 18 Rehabilitating Interiors in Historic Buildings* particularly may be relevant to interior feature projects.

Imitative Substitute Materials: Replacement of interior features with imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the Design Guidelines and design considerations. The following list provides examples of imitative substitute materials for interior features. Please note that the list of materials is anticipated to expand as new materials and products become available.

Vinyl	Vinyl is about half the price of the wooden equivalent. However, vinyl is susceptible to size changes due to heat and easily wear with increased use. Vinyl is prefabricated for interior trim and base molding.
Engineered Wood	Engineered wood is composed of compressed resin and wood chips. Engineered wood often is sold prefabricated into risers and stairs and also can be used for built ins. The lifespan of engineered wood stair units averages 25 years.
Medium- and High-Density Fiberboard	Medium-density fiberboard (MDF) is a durable material less likely to become dented like other synthetic options. MDF built-ins typically are solid core units and may be custom ordered to fit unique spaces. It primarily is composed of discarded wood and other organic materials. The material is heavy and allows for noise control. Additionally, wood veneer can be applied; it also can be painted. MDF is less dense than HDF and more prone to warping. High-density fiberboard (HDF; hardboard) is a dense material composed of discarded wood, like MDF. HDF built-ins typically are solid core units and may be custom ordered to fit unique spaces. The material can be molded to mimic wooden units. Unlike MDF, HDF is manufactured with a wet process that allows the wood fibers to expand and bind. The material can be clad in wood veneer to simulate historic units. It is heavier and more uniform than MDF.

Interior Doors

The *Design Guidelines* for interiors support the repair and maintenance of deteriorated historic interior doors, when appropriate. In cases where replacement of interior doors is desirable or necessary, either the in-kind replacement of historic materials or the installation of imitative substitute materials that simulate the size, style, type, configuration, and finish of the historic building material are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of deteriorated interior doors applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative substitute materials meeting the design considerations and *Design Guidelines*.

Historic Use: Interior doors in pre-1919 housing were wooden, interior grade units. Interior door units include the door, frame, transoms, hardware, and thresholds.

Design Considerations: Five major factors should be considered in the selection of in-kind or imitative substitute materials simulating interior doors: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building and the associated historic district.

Location: Consider retaining historic interior doors in their original location, where possible. Replacement doors should simulate the original design of the element in their original location, as possible.

Type: Interior doors are classified by door design, operation, and number of leaves. Major designs include paneled, flush, and louvered. Door operating types include bifold, sliding, hinged / hung, or pocket doors. The number of door leaves in a unit typically is reflected in the size of the opening. Simulating the historic unit in design, operation, and number of leaves should be considered in replacement, when possible.

Size: Consider matching the dimensions of all components of the door unit in repair and replacement projects. Avoid the addition of infill panels in door bays to accommodate door units that differ in size from the original units, where possible.

Finish: Pigment medium, texture, and reflective quality of finishes to interior doors contribute to visual character of the interior's design. Pigment mediums, including paint and stains, used in replacement should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible.

Design Maintenance: Monitor in-kind or imitative substitute replacement elements in the door unit to assure that new materials are compatible in seasonal expansion and contraction rates with retained elements. Consider adjustments for smooth operation, as indicated.
Recommended Materials:

In-Kind Repair and / or Replacement: In-kind replacement of interior doors is a treatment approach identified in the *Design Guidelines*. In-kind replacement of historic materials should be consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. *Preservation Brief 18 Rehabilitating Interiors in Historic Buildings* may be particularly relevant to interior door projects.

Imitative Substitute Materials: Replacement of interior doors with imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the *Design Guidelines* and design considerations. Exceptions are for security purposes where metal doors may be required. The following list provides examples of imitative substitute materials for interior doors. Please note that the list of materials is anticipated to expand as new materials and products become available.

Molded	Molded doors are solid core units that are lighter than wood; a common material for molded doors is fiberglass or plastic. They are durable and offer insulation. Units are molded to have the appearance of wooden doors and can be coated in wood veneer to better simulate the natural material.
Medium- and High-Density Fiberboard	Medium-density fiberboard (MDF) is a durable material less likely to become dented like other synthetic options. MDF doors typically are solid core units. It primarily is composed of discarded wood and other organic materials. The material is heavy and allows for noise control. Additionally, wood veneer can be applied; it also can be painted. MDF is less dense than HDF and more prone to warping. High-density fiberboard (HDF; hardboard) is a dense material composed of discarded wood, like MDF. HDF doors typically are solid core units. The material can be molded to mimic wooden units. Unlike MDF, HDF is manufactured with a wet process that allows the wood fibers to expand and bind. Doors typically are molded of the material. The material can be clad in wood veneer to simulate historic units. It is heavier and more uniform than MDF.
Hollow Board	Hollow board doors include a hollow core supported by cardboard webbing clad in wood veneer. The doors can be dented easily but are durable if treated correctly. Typically, hollow board doors are flush units and do not include panels. They are not insulating, do not promote fire safety, and do not provide soundproofing.

Fiberglass	Fiberglass doors are lighter than wood and have the added benefit of durability and an insulated core. Units can be coated in wood veneer to better simulate the natural material. However, fiberglass tends to fade.
Metal	Aluminum and steel interior doors may be required for security purposes and can be substituted for historic wooden units. Units can be hollow-core or solid-core. Most metal doors can be clad in wood to simulate the appearance of wooden units and are produced in many different sizes and styles. However, the units can be expensive and can corrode.

Interior Fixtures

The *Design Guidelines* for interiors support the repair and maintenance of deteriorated historic interior fixtures. In cases where replacement of interior fixtures is desirable or necessary, either the in-kind replacement of historic fixtures or the installation of imitative substitute fixtures that simulate the size, type, style, and finish of the historic building element are approaches authorized under the *Design Guidelines*.

The following discussion of treatments appropriate to the replacement of interior fixtures applying the *Design Guidelines* is based on a three-step process: 1) Identify existing and/or historic application; 2) Identify design considerations of location, type, size, finish, and design maintenance to be factored in the replacement as appropriate to the requirements of the project; and 3) Select in-kind or imitative materials meeting the design considerations and *Design Guidelines*.

Historic Use: Interior fixtures historically were used in Army housing during the pre-1919 period as functional and aesthetic elements providing lighting, heat, and accessibility. Fixtures found in pre-1919 housing may include, but are not limited to lighting units, heating elements such as radiators and floor grates, and hardware such as knobs and hinges. Fixtures generally reflect architectural style and commonly available fixtures from the period of construction. Fixtures original to pre-1919 housing have had a high rate of modification or removal over time accompanying the replacement of heating and cooling systems, and quality of life improvements.

Design Considerations: Five major factors should be considered in the selection of replacement units for interior fixtures: location, type, size, finish, and design maintenance. Consideration of these factors will support retention of the overall design integrity of the building:

Location: Ability to support current building systems, quality of design, and condition should be considered in decisions involving the maintenance, repair, or replacement of interior

fixtures. Original fixtures contribute to the historic character of an interior and should be maintained in their original location if feasible. Fixtures of particularly high quality or unusual design may be aesthetic assets. Substantially deteriorated standardized fixtures that do not meet current safety requirements may require substantial investment to retrofit. Consider replacement elements that duplicate the locations of fixtures in historic lighting, hardware, and systems schedules.

Type: Consider developing an inventory of house fixtures to identify the types of surviving original fixtures. Consider retaining the best-preserved examples of the types of fixtures found in the building, as appropriate. Simulating the design character of new fixtures should be considered in fixture replacement.

Size: The dimensions of the interior fixtures also are factors in the appearance of the interior design. Replacement fixtures should approximate the overall height, width, depth, and placement of the existing or historic fixture as closely as possible. Replacement that strives to replicate the dimensions of historic fixture, where possible, will contribute to the preservation of the overall design integrity of the individual house.

Finish: Pigment medium, texture, and reflective quality of finishes to interior fixtures like lighting and hardware, contribute to the historic design and integrity of the house interior. Pigment mediums, including paints and glazes, used in replacement should simulate the finish medium, texture, and reflective quality of the existing or historic materials, where possible. The selection of paint or glaze color should consider compatibility with the historic area. However, it is not necessary to utilize original colors that may have been determined through a chemical paint analysis.

Design Maintenance: Consider replacing historic fixtures with new fixtures with simulated designs. Monitor the condition of antiquated and/or obsolete fixtures on a regular basis, replace them to assure safety.

Recommended Materials:

In-Kind Repair and / or Replacement: In-kind replacement of interior fixtures is a treatment approach identified in the *Design Guidelines*. In-kind replacement of historic fixtures should be consistent with the *Design Guidelines* and design considerations identified for the element. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*. Detailed guidance on in-kind repair and replacement of historic materials has been developed by the National Park Service in their *Preservation Briefs* series. *National Park Service Preservation Brief 3 Improving Energy Efficiency in Historic Buildings, Preservation Brief 18 Rehabilitating Interiors in Historic Buildings,* and *Preservation Brief 24 Heating, Ventilating, and Cooling Historic Buildings: Problems and Recommended Approaches particularly* may be relevant to interior fixture projects.

Imitative Substitute Materials: Replacement of interior fixtures with imitative substitute materials is an allowable treatment approach provided that the imitative substitute material meets the *Design Guidelines* and design considerations. Fixtures are manufactured as individual units

and likely will require care and planning in simulating the type, size, finish, and design of the historic unit.

Aluminum and Nickel	Light fixtures, outlet covers, and hardware such as doorknobs, handles, and hinges are produced in the metals, aluminum and nickel. Aluminum and nickel are lightweight, corrosion resistant, cost-effective metal materials.
Plastic and Rubber Composites	Plastic and rubber composites are plastics that are strengthened with fibers, fillers, particulates, powders, and other matrix reinforcements to provide improved strength or stiffness. Several manufacturers produce plastic and rubber composites that are marketed for lighting trim, outlet covers, plumbing fixtures (such as wash basins and sinks) and certain door hardware. These units are produced in a variety of colors, dimensions, and textures. This material requires minimal maintenance, has a lifespan of 50 years, and is easy to install.
Steel	Steel is an alloy of iron and carbon and, sometimes, other elements such as chromium. Because of its high tensile strength and low cost, steel is often marketed and manufactures for lighting, certain hardware, and plumbing fixtures (such as wash basins and sinks).