



*BEFORE THERE WAS A NATION,  
THERE WAS **THE ARMY***

## **PROGRAM COMMENT FOR ARMY WARFIGHTING READINESS AND ASSOCIATED INFRASTRUCTURE**

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# **PROGRAM COMMENT FOR ARMY WARFIGHTING READINESS AND ASSOCIATED INFRASTRUCTURE**

## **1.0. Introduction**

**Authority.** Section 106 of the National Historic Preservation Act, 54 U.S.C. 306108 (Section 106 and NHPA), requires Federal agencies to consider the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment with regard to such undertakings. The ACHP has issued regulations that set forth the process through which Federal agencies comply with their statutory responsibilities. Those regulations are codified under 36 CFR § 800 (Section 106 regulations).

A Section 106 undertaking is defined in 36 CFR § 800 to include all activities funded by and under the jurisdiction of a Federal agency. Under 36 CFR § 800.14(e), Federal agencies can request the ACHP provide a “program comment” on a “category of undertakings” in lieu of conducting individual reviews of such undertakings under 36 CFR § 800.3 through 800.7. The category of undertakings addressed under this program comment is Army warfighting readiness activities and management actions on associated infrastructure.

A Federal agency can meet its Section 106 responsibilities by following the process set forth in an applicable program comment. The Department of the Army (Army) requested the ACHP provide this Program Comment for Army Warfighting Readiness and Associated Infrastructure (program comment) to better support Army warfighting readiness activities and the rapid transformation of those activities and associated infrastructure.

**Summary.** In 2002, the Army developed the first federal agency program comment for Army Capehart-Wherry housing. Since then, the Army and ACHP have developed a suite of additional program comments covering all 30,000 historic Army homes, and several other Army and Department of Defense-wide program comments. The Army’s program comments are a federal benchmark; other federal agencies have followed the Army’s program comment approach and the ACHP has adopted practices developed by the Army as best practices for federal agency program comment development.<sup>1</sup>

This program comment elevates that standard by directly addressing the Army’s warfighting readiness activities and the infrastructure that supports those activities. This program comment represents a transformative approach to historic property management, intended to strategically align Section 106 procedures with the imperative of the Army’s warfighting readiness activities. This program accelerates and improves Section 106 compliance for Army warfighting readiness and associated infrastructure by reducing bureaucracy, optimizing resources, and by replacing subjective assessments with defined standards and procedures to ensure predictable outcomes. It

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<sup>1</sup> See ACHP Success Stories <https://www.achp.gov/success-stories/capehart-wherry-army-housing>, and <https://www.achp.gov/army/army-nhpa-strategy>. See <https://www.denix.osd.mil/army-cr/army-dod-comments/> for a summary of each Army and DoD program comments.

is an at scale solution that enables Army-wide warfighting readiness while responsibly balancing historic preservation values.

In this program comment, the Army has identified and detailed the category of undertakings, specified the likely effects on historic properties, and identified steps it will take to ensure the effects are considered. The Army followed the public participation and consultation procedures for program comments at 36 CFR § 800.14 (e) and (f). During July and August 2025, the Army held six nationwide consultation conferences with the public and interested parties where it consulted with State Historic Preservation Offices (SHPO), non-governmental historic preservation advocacy organizations (including the National Trust for Historic Preservation, the National Conference of State Historic Preservation Officers, and the National Association of Tribal Historic Preservation Officers), Native Hawaiian Organizations (NHO), and Federally recognized Tribes. In September 2025, the Army also held two government-to-government consultation conferences exclusively with Federally recognized Tribes. The Army formally elicited the views of the public and interested parties through a Federal Register notice on July 25, 2025 (90 FR 35287), considered and addressed all comments received, and where feasible incorporated their recommendations. The Army implemented best practices in preparation of this program comment and completed all due diligence for program comment development required under 36 CFR § 800.

**Need for the Program Comment.** Title 10 U.S. Code § 7062 states the Army's mission is to defend the United States, support national policies, implement national objectives, and to counter aggressive actions of other nations that threaten our peace and security. This mission demands an Army that is prepared and ready for complete and immediate mobilization in defense of the nation. The statutory mission defined in Title 10 drives Army warfighting readiness activities from training, testing, equipping, and industrial activities to management actions on the infrastructure associated with those readiness activities.

To ensure continued dominance on the modern battlefield, the Army is undergoing a rapid and comprehensive transformation, modernizing its training, testing, equipment, industrial operations, and associated infrastructure.<sup>2</sup> The Army is moving to implement sweeping reforms under its Continuous Transformation initiative by reexamining all requirements effecting warfighting readiness and addressing outdated, redundant, and inefficient practices and programs. The Army's Continuous Transformation will create a leaner, more lethal fighting force capable of outclassing and outmaneuvering adversaries across all domains - land, air, sea, space, and cyberspace. Through a comprehensive review of all requirements, the Continuous Transformation initiative is identifying and addressing deficiencies and rapidly implementing reforms, and this program comment is an integral part of the Army-wide transformation.

A critical component of the Army's Continuous Transformation initiative is the modernization of the built infrastructure on Army installations. New weapons systems, equipment, and tactics necessitate updated training and testing ranges and associated infrastructure, and construction of new facilities. Installation infrastructure must be upgraded to provide the necessary capacities. Upgrading roads, railways, and airfields is critical for deploying and sustaining Army forces.

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<sup>2</sup> See <https://www.defense.gov/News/News-Stories/Article/Article/4172313/hegseth-tasks-army-to-transform-to-leaner-more-lethal-force/>.

Installations also serve as laboratories for testing and evaluating new military technologies and concepts in a real-world environment. Investing in childcare centers, healthcare facilities, and recreational facilities improve the quality of life for soldiers and their families – also a critical component of warfighting readiness.

The Army's warfighting readiness hinges on both its built infrastructure and its natural infrastructure. The natural infrastructure on Army installations includes all naturally occurring ecosystems and associated natural features such as forests, wetlands, rivers and streams, lakes, riparian areas, deserts, grasslands and prairies, all habitats, vegetation, soils, mineral resources, and geological features. The natural infrastructure is an indispensable asset for multi-domain operations training, high-intensity conflict preparation, and the rigorous development, testing, and fielding of modernized combat systems and materiel. Warfighting readiness demands unimpeded access to and land management actions that maintain realistic natural landscapes and environmental conditions that accurately simulate combat conditions. Army installations are the indispensable foundation for the Army's transformation, providing the infrastructure, facilities, support services, and authentic natural environments vital for training soldiers, sustaining combat readiness, and modernizing and testing new equipment and weapons systems.

This program comment closely integrates with the military mission by placing warfighting readiness within the nationwide *Military Landscape* context. The program comment provides a more structured, standardized Army-wide approach that ensures the Army fulfills its responsibilities under Section 106. It is a vital strategic tool that directly supports the Army's ability to achieve rapid transformation of its warfighting readiness activities while simultaneously affirming its commitment to historic preservation.

## **2.0. Army Section 106 Compliance Challenge**

**Scale of the Challenge.** The Army has 250-years of experience designing, building, operating, and maintaining military infrastructure. Since its origins as the Continental Army in 1775, the Army has designed and constructed an enormous portfolio of real property assets. The Army has a sprawling infrastructure of 14 million acres and 135 installations with over 390,000 buildings and structures exceeding one billion square feet, designed, built, and managed by the Army for warfighting readiness purposes.

Currently, the Army has over 200,000 properties subject to compliance with Section 106 (122,000 buildings and structures and 84,000 archeological sites). As its infrastructure ages in the coming years, the Army will have over 500,000 properties subject to Section 106 review (390,000 buildings and structures and an estimated 129,000 total archeological sites). For an inventory of this scale and growth trajectory, the project-by-project, step-by-step review process for undertakings required by 36 CFR § 800 and Army Section 106 agreements is not sustainable.

**Army's Section 106 Program.** The Army is dedicated to pursuing innovative policies, programs, and initiatives to improve its Section 106 compliance processes. The Army has a well-established award-winning historic preservation program and a strong record of innovative programmatic Section 106 compliance. For over 40 years, the Army has maintained historic preservation professionals on staff and has had Army-wide policy implementing the requirements of Section 106 and 36 CFR § 800. The Army's Section 106 policy is in Army

Regulation 200-1 *Environmental Protection and Enhancement* (AR 200-1), and in additional policy and guidance issued by the Army Federal Preservation Officer (FPO).<sup>3</sup>

The Army FPO, in the Office of the Assistant Secretary of the Army for Installations, Energy and Environment, is responsible for Army-wide NHPA policy and Section 106 compliance oversight. Army commands and installations have qualified professionals that implement installation level Section 106 compliance activities. Under AR 200-1, each installation is required to have a Cultural Resources Manager (CRM) responsible for compliance with NHPA and other statutory cultural resource requirements and must establish government-to-government relationships with Federally recognized Tribes. The Army has 124 installation level Integrated Cultural Resource Management Plans used by the CRMs as their internal program planning tool for compliance with NHPA and other cultural resource requirements.

Under AR 200-1, installations must establish a process for early coordination between the CRM and all installation staff elements, tenants, proponents of projects and actions, and others to allow for proper identification, planning, and programming for Section 106 requirements. AR 200-1 requires installations to identify, evaluate, assess, and treat the effects of undertakings on historic properties, and if an Army undertaking may affect a property of traditional religious and cultural significance to a Federally recognized tribe, the installation must initiate government-to-government consultation with the affected tribe.

AR 200-1 requires compliance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation<sup>4</sup> during the identification, evaluation, and treatment of historic properties. To implement these requirements, installation CRMs use established contracts and service agreements with qualified cultural resources management firms and professional organizations and have access to a cadre of qualified professionals in the US Army Corps of Engineers. This ensures that Army actions pertaining to historic properties are conducted under the supervision of individuals who meet the Secretary of the Interior's professional qualifications at 36 CFR 61.

The Army has received many historic preservation awards from state and local historic preservation organizations, SHPOs, and national-level awards from the National Trust for Historic Preservation, the ACHP, and the Office of the Secretary of Defense. The Army's record of successful innovation in Section 106 compliance is also demonstrated by the Army's program comments covering all historic Army homes. As a result of the Army's program comment efforts for its historic housing, its Section 106 compliance activities now occur internally for over 30,000 historic Army homes following the terms of those program comments, without individual project-by-project, step-by-step reviews and consultations for covered undertakings with SHPOs, ACHP, and others.

The requirement for federal agencies to conduct Section 106 project-by-project, step-by-step review and consultation originated in 1979, when 36 CFR § 800 was first published. The

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<sup>3</sup> See Army NHPA policies at the Army Historic Preservation and Cultural Resources Management website <https://www.denix.osd.mil/army-cr/>.

<sup>4</sup> Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines. 48 FR 44716. Department of the Interior, National Park Service. September 29, 1983.

regulation assigned SHPOs a central role in Section 106 project review because at that time federal agencies lacked historic preservation programs and professional staff expertise.<sup>5</sup> That 1979 project-by-project, step-by-step review process for undertakings in 36 CFR § 800 remains essentially unchanged today.

The Army has a sophisticated program with qualified historic preservation professionals at all levels within the department, designated CRMs at each installation, all work conducted to the Secretary of the Interior Standards under the supervision of qualified professionals, and an extensive Section 106 compliance program driven by Army-wide regulation, policy, plans, and guidance overseen by the Army's professionally qualified FPO. Despite this significant shift in capabilities since 1979, the Army continues to be bound by the project-by-project, step-by-step consultation process in 36 CFR § 800 for warfighting readiness activities and associated infrastructure, raising the question of its continued efficacy for the Army.

**Inefficiency of the Section 106 Compliance Process.** The inefficiency of the Army's current Section 106 compliance process is evident in the fragmented system of 115 individual Army installation level Section 106 PAs, MOAs, and Army Alternate Procedures (AAP) listed in Appendix E. The 115 installation compliance agreements have created a convoluted, overly complex, and inconsistent regulatory environment where each installation agreement has different idiosyncratic requirements and standardized Army-wide historic buildings and structures are treated differently under different agreements. This inconsistency is particularly illogical because, since 1866, the Army's construction of buildings has relied on standardized Army-wide plans and designs, resulting in nearly identical building types and installation designs nationwide.<sup>6</sup> The challenge is further compounded by individual installations operating under multiple concurrent Section 106 agreements, and by varying stakeholder interpretations of 36 CFR § 800 that deviate from the regulatory framework.

Although intended to streamline the Section 106 process, the Army's installation level PAs necessitate repetitive project-by-project, step-by-step consultations even for undertakings having no adverse effect to historic properties, and for repetitive actions on standardized property types found at many installations. Under its Section 106 compliance agreements the Army has been subject to overly restrictive museum-level standards for historic building renovations, significant delays in executing Section 106 compliance actions, overly expansive mitigation requirements, mitigation requirements for properties that have already been addressed under nationwide program alternatives, and mitigation requirements that treat Army installations as tourist attractions rather than vital national defense components with restricted public access.<sup>7</sup>

The Army has also been required to use costly historic and in-kind building materials and specialized craftsmen for repairs and improvements, imposing highly restrictive museum-level preservation and restoration standards to Army properties where more appropriate rehabilitation standards and more cost-effective substitute materials should be applied. The issue of inconsistent and overly restrictive application of the Secretary of the Interior's Standards by

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<sup>5</sup> Cultural Resource Laws and Practice. Thomas King, Altamira Press, 2nd ed., 2004.

<sup>6</sup> Context Study of the United States Army Quartermaster General Standardized Plans 1866-1942. US Army Corps of Engineers, Seattle District, 1997.

<sup>7</sup> For specific examples, see Supplemental Information Briefing at <https://www.denix.osd.mil/army-pcwr/>.

SHPOs and the National Park Service (NPS) has also been identified by the ACHP Chairman in the Report and Recommendations on the Application of Federal Historic Preservation Standards.<sup>8</sup> High cost museum-level preservation and restoration requirements has prohibited the full execution of Army scopes of work for maintenance and renovation projects, contributing to a backlog of deferred maintenance and renovation.

The Army's current Section 106 agreements in Appendix E all lack a systematic procedure for selecting building materials for maintenance, repair, rehabilitation, and renovation projects. This inconsistency is compounded by the general failure to apply the Secretary of the Interior's Standards<sup>9</sup> requirement at 36 CFR § 68.3 for consideration of the economic and technical feasibility of projects subject to those standards. The Army's agreements also lack standard historic building design guidelines, a catalog of applicable building materials, and a standardized process for evaluating the full range of appropriate materials, including alternative and cost-effective substitute materials permitted under the Secretary's Standards for Rehabilitation (36 CFR § 68.3(b)).

This situation leaves the Army facing highly variable, costly, and overly restrictive standards under an inadequate and fragmented Section 106 compliance system. This program comment addresses this challenge by providing a holistic, consistent, and streamlined Army-wide solution for Section 106 compliance. It is a modernized regulatory approach that reflects the evolved capabilities of the Army.

### **3.0. The Program Comment Solution**

The current fragmented, inconsistent, subjective approach to Section 106 compliance impedes the Army's warfighting readiness activities. The Army's extensive growing infrastructure and the complex project-by-project Section 106 review process, coupled with inconsistent installation-level agreements and overly restrictive standards, leads to delays and increased costs in construction, renovation, and maintenance projects essential for warfighting capabilities. The delays, along with the high costs associated with required historic materials and specialized craftsmanship, divert resources and manpower away from critical objectives, ultimately hindering the Army's ability to effectively train, equip, and deploy forces, impacting its overall readiness posture.

As previously described, the Section 106 review process disproportionately affects the Army owing to the number of Army properties subject to Section 106 and the critical need for rapid Army-wide transformation and modernization. This program comment restructures and accelerates Army compliance with Section 106 and 36 CFR § 800. This program comment applies the Section 106 compliance paradigm established by the ACHP in the program comments for the Army's 30,000 historic homes to the Army's warfighting readiness activities and associated infrastructure. In accordance with 36 CFR § 800.14 (e), the Army will follow the terms of this program comment in lieu of conducting individual project-by-project reviews with

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<sup>8</sup> Report and Recommendations on the Application and Interpretation of Federal Historic Preservation Standards. Sara C. Bronin, Chairman, ACHP, March 1, 2024. <https://www.achp.gov/sites/default/files/2024-03/StandardsReportWithAppendices.pdf>

<sup>9</sup> The Secretary of the Interior's Standards for the Treatment of Historic Properties, 36 CFR 68. July 12, 1995.



ACHP, SHPOs, and others. This program comment reduces the ambiguity and subjectivity in the Section 106 process and provides predictable, streamlined procedures and outcomes.

Unlike PAs and MOAs, program comments are a higher-order compliance instrument intended to address an agency-wide category of undertakings and are subject to a higher-level of consultation and ACHP approval. They offer a strategic alternative to the standard Section 106 project-by-project, step-by-step review process. An important benefit of program comments is that they allow a federal agency to comply with Section 106 in a tailored, consistent way for an agency-wide category of undertakings rather than addressing each undertaking individually. Program comments enable a federal agency's headquarters to establish a broader, more holistic approach to Section 106 compliance than is possible at the local level.<sup>10</sup> This is especially vital for the Army with its vast nationwide inventory of properties subject to Section 106, the many recurring undertakings associated with the Army's warfighting readiness activities, and the imperatives of the Army's Continuous Transformation initiative.

This program comment offers an at scale solution that professionally manages historic properties while enabling the Army to rapidly transform and modernize. It leverages the successful processes and guidelines of the ACHP-approved program comments for historic Army housing that streamline compliance, preserve the historic character of the housing, help improve the quality of life for soldiers and their families, and have saved millions of dollars in upgrades and renovations. The program comments for historic Army housing demonstrate that this streamlined approach effectively balances historic preservation with military needs.<sup>11</sup>

This program comment recognizes the historic interconnectedness of Army housing with other built infrastructure on its installations. In acknowledging their contemporary development, this program comment applies the preservation processes and guidelines applied to the Army's pre-1941 historic housing to the Army's pre-1941 built infrastructure. This program comment recognizes that historic Army housing and warfighting readiness associated infrastructure were planned and developed in a coordinated manner during the same time periods. Under this program comment, they are now treated in the same manner for Section 106 compliance.

This program comment is not simply a matter of administrative efficiency; it is a critical imperative for ensuring the Army's warfighting readiness. It provides a proven, effective, and responsible framework for balancing historic preservation with the urgent need to modernize Army installations and maintain a dominant fighting force. Additional information on this program comment is at: <https://www.denix.osd.mil/army-pcwr/>.

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<sup>10</sup> ACHP "Program Comment Questions and Answers"  
[https://www.achp.gov/program\\_comment\\_questions\\_and\\_answers](https://www.achp.gov/program_comment_questions_and_answers).

<sup>11</sup> See the four program comments for historic Army housing summarize at <https://www.denix.osd.mil/army-cr/army-dod-comments/>. For additional details including annual reports for the program comments for Pre-1919 housing, Inter-War era housing (1919-1940) and Vietnam War Era housing (1963-1975) see the following sites: <https://www.denix.osd.mil/army-pre1919-pchh/>, <https://www.denix.osd.mil/army-pchh/>, and <https://www.denix.osd.mil/army-vwehh-pc/>.

#### **4.0. Program Comment Goal and Category of Undertakings**

**Goal.** The goal of this program comment is to obtain programmatic compliance with Section 106 for the Army's warfighting readiness activities and associated infrastructure by means of this program alternative under 36 CFR § 800.14(e). This program comment establishes nationwide consistency in Section 106 compliance for Army warfighting readiness activities and management actions on associated infrastructure.

**Category of Undertakings and Effect.** The category of undertakings addressed by this program comment is Army warfighting readiness activities and management actions on associated infrastructure.

Discrete subsets of warfighting readiness activities are detailed in Appendix A, and associated built infrastructure is detailed in Appendix B. All warfighting readiness activities are covered by this program comment, whether or not they are specifically described in Appendix A. All associated infrastructure is covered by this program comment, whether or not they are specifically described in Appendix B.

The category of undertakings addressed by this program comment may adversely affect historic properties through ground disturbing activities and by management actions occurring on associated infrastructure. Adverse effects will be avoided whenever possible, and where avoidance is not possible, adverse effects will be treated through minimization and mitigative measures.

#### **5.0. Operating Principles Governing Implementation of the Program Comment**

Implementation of this program comment evidences the Army's compliance with NHPA Section 106 and 36 CFR § 800 for all Army warfighting readiness activities and management actions on all associated infrastructure. The Army shall implement this program comment in accordance with the following operating principles:

This program comment applies to and shall be implemented by the Active Army, Army Reserves, and the Army National Guard (for federal activities), at all installations, facilities, and locations where Section 106 is applicable.

This program comment replaces the procedures in 36 CFR § 800.3 - 800.7 for Army warfighting readiness activities and management actions on associated infrastructure. Therefore, Army installation project-by-project review and consultation with SHPOs and the ACHP for that category of undertakings is no longer required and shall no longer occur.

While the Army possesses equivalent expertise, knowledge, and access to information regarding historic properties as SHPOs, NPS, and ACHP, it does not possess Traditional Knowledge regarding properties of traditional religious and cultural importance to Federally recognized Tribes and NHOs. This program comment therefore ensures that Army installations, through consultation with Federally recognized Tribes and NHOs as outlined herein, consider Indigenous

Knowledge and take into consideration the significance that Federally recognized Tribes and NHOs ascribe to properties of traditional religious and cultural importance.

This program comment does not affect or in any way alter the Army's responsibilities under applicable Treaties, the Native American Graves Protection and Repatriation Act, American Indian Religious Freedom Act, or Executive Order 13007 Indian Sacred Sites, or any requirements other than those of Section 106.

This program comment meets the requirements of NHPA Section 306107 by planning and requiring actions to minimize harm to National Historic Landmarks (NHLs) to the maximum extent possible. For undertakings adversely affecting NHLs, the Army FPO will consult with the ACHP and NPS as stipulated herein.

This program comment identifies Army installations as historic military landscapes that serve as the nationwide context for Army warfighting readiness activities and treatment of historic properties under this program comment.

This program comment establishes that the ongoing execution of the Army warfighting readiness activities and management actions on associated infrastructure supports the preservation of the Army's historic military landscapes.

This program comment is supported by comprehensive documentation of World War II and Cold War era (1941-1989) historic properties prepared by the Army and DoD.<sup>12</sup>

This program comment confirms that the comprehensive documentation of World War II and the Cold War era historic properties and the preservation of Army World War II and the Cold War NHLs mitigates the effects of warfighting readiness activities and management actions on all non-NHL historic properties from the WWII and Cold War eras (1941-1989).

This program comment confirms that no further Section 106 requirements apply to non-NHL WWII and Cold War era infrastructure constructed from 1941-1989.

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<sup>12</sup> The Department of Defense Cold War Historic Properties Bibliography at <https://www.denix.osd.mil/army-pcwr/> is a 244-page annotated bibliography that contains approximately 400 individual reports that document historic properties from the Cold War era for the Army and the Department of Defense as a whole. Also see: National Historic Context for Department of Defense Installations, 1790-1940, Volumes I-4. DoD Legacy Resource Management Program Project 92-0075 (1995); Military Training Lands Historic Context, USACERL, 2010; World War II Temporary Military Buildings, USACERL Technical Report CRC-93/01, 1993; World War II and the U.S. Army Mobilization Program: A History of 700 and 800 Series Cantonment Program, Legacy Resources Management Program, USACERL; Army Ammunition Production During the Cold War (1946-1989), US Army Environmental Command, 2009; Army Ammunition and Explosives Storage in the United States: 1775-1945, US Army Corps of Engineers, 2000; Unaccompanied Personnel Housing During the Cold War 1946-1989, US Army Environmental Center, 2003; Historic Context for DoD Facilities WWII permanent Construction, US Army Corps of Engineers, Baltimore District, 1997; Historic Context for DoD Facilities World War II Permanent Construction, US Army Corps of Engineers, Baltimore District, 1997; California Historic Military Buildings and Structures Inventory, US Army Corps of Engineers, Sacramento District, 2000; A Historic Context for the African American Military Experience, USACERL, 1998; Army historic contexts at <https://aec.army.mil/Conservation/Cultural-Resource-Technical-Documents/>.

This program comment confirms that Army World War II and the Cold War era NHLs will continue to be managed as NHLs with a higher standard of review and treatment as stipulated herein.

This program comment confirms that no further Section 106 requirements apply to the interiors of pre-1941 associated infrastructure.

This program comment ensures that the Secretary of the Interior's Standards for Rehabilitation are applied to the exterior front facades of pre-1941 associated infrastructure and the economic and technical feasibility of each project is considered as required by 36 CFR 68.3.

This program comment implements the Secretary's Standards for Rehabilitation through application of the Design Guidelines and the Building Materials Guidelines and Catalog in appendices C and D for the exteriors pre-1941 associated infrastructure.

This program comment implements the Secretary's Standards for Rehabilitation through a standardized building materials selection procedure for the exterior front facades of pre-1941 associated infrastructure that ensures consideration of repair of historic building materials or, where repair is not feasible, the use of in-kind building materials or substitute building materials in management actions.

This program comment confirms that the Secretary's Standards for Rehabilitation provide for the use of substitute building materials when use of historic building materials and in-kind building materials are not economically or technically feasible.

This program comment confirms that substitute building materials are reversible and can be replaced with in-kind building materials at any time.

This program comment confirms that the effect of its procedure for Management of the Exteriors of Pre-1941 Built Infrastructure is not adverse.

This program comment confirms that any warfighting readiness related physical changes to the setting of historic properties and the introduction of any warfighting readiness related visual, atmospheric, and audible elements contribute to the significance of the historic military landscape and such effects are not adverse under this program comment.

This program comment shall be applied to all associated infrastructure that becomes subject to Section 106 review in the future.

This program comment shall be implemented to meet all Section 106 compliance requirements for the Army Readiness and Environmental Protection Integration (REPI) program and its actions.

This program comment identifies National Mitigation Areas that preserve a broad range of historic property types and confirms that the National Mitigation Areas are an enduring compensatory mitigation for implementation of this program comment.

This program comment confirms that historic Army housing and warfighting readiness associated infrastructure were planned and developed concurrently, during the same time periods, following standardized Army plans. Therefore, for management consistency, this program comment authorizes the Army to consolidate the program comments for historic Army housing<sup>13</sup> under this program comment.

## **6.0. Implementation of the Program Comment**

Program comments offer federal agencies a valuable tool to move beyond local project-specific Section 106 considerations. They enable a more comprehensive and holistic agency-wide approach to Section 106 compliance not attainable through the standard Section 106 project-by-project review process occurring at the state and local level. The nationwide approach in this program comment enhances state and local level histories by identifying their appropriate nationwide context and placing those state and local histories within that national perspective.

### **6.1. The Military Landscape and Associated Infrastructure**

This program comment implements the concept of the *military landscape* as the nationwide context for warfighting readiness. Each Army installation in its entirety is a military landscape characterized by the following features:

- Warfighting readiness activities as the fundamental factor influencing the landscape and associated infrastructure development.
- Siting and layout related to the evolution of the military mission and warfighting readiness activities.
- High level of similarity, with basic components and building designs and installation designs repeated within and between installations.
- Remnants of earlier pre-military landscapes, sites, and features.
- Restricted access, controlled entrance and exit points, not open to the general public.
- Defined borders created through fencing, walls, guard posts, and other security features.

The installation military landscape is a holistic, all-encompassing concept composed of two primary components: *built infrastructure* and *natural infrastructure*, collectively referred to in this program comment as *associated infrastructure*.

Built infrastructure includes all properties in Army real property Category Codes 1-8, see Appendix B. Appendix B also provides information on the subset of 9,987 pre-1941 buildings and structures that are subject to special preservation procedures and guidelines in this program comment. Natural infrastructure includes all naturally occurring ecosystems, natural resources, and natural features on Army installations including but not limited to forests, wetlands, rivers,

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<sup>13</sup> Program comments for historic Army housing subject to consolidation are: Program Comment for Preservation of Pre-1919 Historic Army Housing, Associated Buildings and Structures, and Landscape Features; Program Comment for Department of the Army Inter War Era Historic Housing, Associated Structures, and Landscape Features (1919-1940); Program Comment for Department of the Army Capehart and Wherry Era Army Family Housing, Associated Structures, and Landscape Features (1949-1962); and Program Comment for Department of the Army Vietnam War Era Historic Housing, Associated Buildings and Structures, and Landscape Features (1963-1975).

streams, lakes, riparian areas, deserts, grasslands, prairies, habitats, vegetation, soils, mineral resources, and geological features.

Installation military landscapes are a unique and dynamic nationwide historical entity; they are the only landscapes in the U.S. that have been and continue to be actively shaped by ongoing military warfighting readiness activities. Unlike static historic military sites such as battlefields or military memorials, installation military landscapes are the living, evolving manifestation of the Army's past and present warfighting readiness activities.

The military landscape, as a distinctive type of cultural landscape,<sup>14</sup> is the nationwide context for Army warfighting readiness activities and for the treatment of historic properties under this program comment. The military landscape context recognizes that each Army installation is a continuously evolving historic military landscape. Army military landscapes are defined by ongoing infrastructure change and modification in response to the changing demands of the Army's warfighting readiness activities.

When installation missions change throughout history, the physical development and appearance of those installations also changes. Military landscapes are continually evolving in response to changes in military mission, training, and advancements in battle systems and weapons technology. Warfighting readiness activities have been and continue to be the predominant factor shaping the landscape and associated infrastructure of every Army installation. Elements and remnants of other historic properties that pre-date military use are incorporated within the predominate military landscape, and any effects to such properties are addressed through the procedures in this program comment.

While many installations possess deep historical roots, some tracing back to the early 19th century and many expanding dramatically during World War II, the overarching and continuous force shaping all these landscapes is the warfighting readiness mission itself. To historic preservationists, Army installations may appear as “chaotic mixes of land-use areas and unrelated architectural styles”<sup>15</sup> but this dynamic ever-changing character is precisely what defines their significance. Historic preservationists working on Army installations have sought to identify historic military landscapes by looking for geographic sub-areas on installations with specific historical associations.<sup>16</sup> This approach overlooks the fact that Army installations in their entirety are evolving historic military landscapes and that the continuous change intrinsic to warfighting readiness activities defines their historic character and integrity.

The Army's warfighting readiness activities are not a static backdrop but the fundamental driver of the character and evolution of the installation military landscape. Changes in military doctrine, operational requirements, and technological advancements initiate a continuous process of adaptation involving new construction, rebuilding, demolition, reuse, and physical expansion and contraction of installations. Installations have frequently undergone rapid transformations, acting as a perpetual crucible in response to national defense crises and fueled by advancements in

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<sup>14</sup> Guidelines for Identifying and Evaluating Historic Military Landscapes. Construction Engineering Research Laboratory. Susan Keith Loechl, Susan Ensore, and Megan Weaver Tooker. ERDC/CERL TR-09-6, 2009.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

training methods, battle systems, and weapons technology. This dynamic process is embodied in the Army's current Continuous Transformation initiative.

Military landscapes provide the context and setting within which all warfighting readiness activities occur. The character and defining features of these landscapes are intrinsically linked to and actively maintained by the continuous execution of those warfighting readiness activities. Consequently, the changes and new features that emerge from ongoing warfighting readiness activities are not incidental alterations but intrinsic character-defining elements essential to the military landscape's ongoing historical narrative. Therefore, any warfighting readiness activity-related physical changes to the setting of historic properties and any visual, atmospheric, and audible elements or changes resulting from those activities are defining characteristics of evolving military landscapes.

The historic military landscape context has an important implication for the Section 106 process. The project-by-project review processes in 36 CFR § 800.3 – 800.7 and in Army Section 106 compliance agreements adversely effects historic military landscapes. The project-by-project review process delays, modifies, and may halt full implementation of Army warfighting readiness activities and critical associated infrastructure development. This directly impacts the defining features and characteristics that contribute to the historical significance of the military landscape. In essence, the standard Section 106 project review process compromises and diminishes the integrity of these evolving, living historic landscapes by hindering the ongoing historical processes that continue to shape them.

For Army military landscapes, the critical balance lies in acknowledging that warfighting readiness activities are not external to their history but the very engine driving their historical significance. The military landscape perspective clarifies that streamlining and accelerating execution of the warfighting readiness activities in fact supports the preservation of these historic landscapes.

## **6.2. Historic Properties Management Procedures**

### **6.2.1. General Management Procedures**

For all warfighting readiness activities and management actions on associated infrastructure, the identification, evaluation, determination of effect, monitoring, treatment and mitigation of adverse effects to historic properties will be implemented by Army installations and activities in an accelerated manner following this program comment in lieu of conducting individual project-by-project reviews in 36 CFR § 800.3 - 800.7 and under Army Section 106 PAs, MOAs, and AAPs.

Army installations will define the area of potential effect of undertakings and make a reasonable and good faith effort to identify historic properties within the area of potential effect. Army installations will evaluate identified properties for eligibility for inclusion in the National Register of Historic Places under the applicable National Register criteria. Army installations will assess the effect of undertakings on historic properties (i.e., no historic properties affected, historic properties affected, no adverse effect, and adverse effect). Army installations will

address historic properties that are adversely affected by undertakings following the standard mitigation procedures in this program comment. Any warfighting readiness activity-related physical changes to the setting of historic properties and the introduction of any warfighting readiness activity-related visual, atmospheric, and audible elements contribute to the significance of the military landscape and therefore shall not be assessed as an adverse effect under this program comment.

Identification, evaluation, assessment of effect, and documentation / mitigation of historic properties will be conducted by installations in consideration of the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation,<sup>17</sup> and under the supervision of individuals that meet the Secretary of the Interior's Professional Qualification Standards.<sup>18</sup> The passage of time, changing perceptions of significance, or incomplete prior evaluations may require installations to reevaluate properties within the area of potential effects of undertakings that were previously determined eligible or ineligible for inclusion in the National Register of Historic Places. Installations may prepare lists of routine undertakings with known effects that are not adverse, and such routine undertakings will not be subject to further installation review under this program comment. Lists of routine undertakings not subject to further review will be maintained by the CRM.

Historic property identification, evaluation, assessment, monitoring, and documentation / mitigation activities will not occur in areas where there are health or safety hazards including but not limited to areas containing unexploded ordnance (UXO) such as impact areas and surface danger zones, and any contaminated land areas and contaminated properties. The Army's enduring National Mitigation Areas identified in this program comment are compensatory mitigation for any adverse effects that may occur to historic properties in areas where there are health or safety hazards.

Indigenous Knowledge. The Army recognizes Indigenous Knowledge as a distinct form of expertise that is not possessed by the Army, SHPOs, NPS, or the ACHP. The Army recognizes the importance of incorporating Indigenous Knowledge in considering effects to properties of traditional religious and cultural importance. Therefore, Army installations will seek and incorporate Indigenous Knowledge regarding such historic properties from Federally recognized Tribes and NHOs. Installations will assess how actions under this program comment may affect such properties, considering the cultural values and beliefs associated with those properties. Installations may, subject to the availability of funds, reimburse travel expenses for tribal members and NHO members when consulting and seeking indigenous knowledge.

#### **6.2.2. Management of the Exteriors of Pre-1941 Built Infrastructure (Properties Constructed in 1940 and Earlier)**

The Army will follow the building materials selection procedure, the design guidelines in Appendix C, and the building materials guidelines and catalog in Appendix D for management actions affecting the exterior front facades of pre-1941 buildings, structures, and districts

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<sup>17</sup> Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines. 48 FR 44716. Department of the Interior, National Park Service. September 29, 1983.

<sup>18</sup> *ibid.*



associated with the Army's warfighting readiness activities (see Appendix B). These provisions do not apply to side or rear elevations of pre-1941 buildings and structures. There are no special procedures, building materials, or preservation measures required for side or rear elevations of pre-1941 buildings and structures. In consideration of the military landscape context, the effect of this provision regarding management of the exteriors of pre-1941 built infrastructure is considered not adverse under this program comment.

For exterior management actions affecting the front facade of pre-1941 buildings and structures eligible for listing in the National Register of Historic Places, the following procedure will be implemented by Army installations to select appropriate building materials:

**Building Materials Selection Procedure:**

- (a) Assess the historic building material in terms of condition, design, material, performance, safety, and presence of hazards such as lead-based paint, asbestos, and other hazardous materials or conditions;
- (b) Determine if historic building materials can be repaired or if they should be replaced due to technical and financial feasibility factors, or presence of hazards. Consider health and safety factors, and availability of historic materials and skilled craftsmen required for their application.
- (c) If replacement of historic materials is required, determine if there are material characteristics of the historic building materials that should be improved upon;
- (d) Identify potential in-kind building materials and substitute building materials with reference to Appendix C and Appendix D. Compile a short list of potential in-kind building materials and/or substitute building materials;
- (e) Determine the technical feasibility of the potential in-kind and substitute materials;
- (f) Determine the financial feasibility of the potential in-kind and substitute materials; and
- (g) Select and use the appropriate in-kind building material or substitute building material in consideration of technical and financial feasibility.

**6.2.3. Management of the Interiors of Pre-1941 Built Infrastructure (Properties Constructed in 1940 and Earlier)**

The Army's pre-1941 buildings and structures have been in continuous use by the Army since their construction. Many original interior floorplans have been modified; current floorplans include rooms that were not features of the original design, new walls and partitions have been added that were not features of the original design, 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. Additionally, the interiors of pre-1941 buildings and structures represent the

ongoing evolution of interior spaces in response to changing military requirements and the interiors must continue to develop and change in response to changing military needs. Therefore, there are no further Section 106 requirements or reviews, special building material requirements, design considerations, or special historic preservation procedures for maintenance, repair, rehabilitation, renovation, or floorplan alternation required for the interior spaces of all pre-1941 buildings and structures.

#### **6.2.4. Management of Built Infrastructure from WWII and Cold War Periods (1941-1989) (Properties Constructed in 1941 Through and Including 1989)**

Section 106 compliance for representative historic properties constructed during WWII and the Cold War era has been addressed under the following nation-wide programmatic compliance actions: Programmatic Memorandum of Agreement (PMOA) for DOD World War II Temporary Buildings, Program Comment for WWII and Cold War Era Army Ammunition Production Facilities, Program Comment for Department of Defense WWII and Cold War Era Ammunition Storage Facilities, Program Comment for Department of Defense Cold War Era Unaccompanied Personnel Housing (UPH).<sup>19</sup> Documentation of these representative properties exists in the studies prepared for those agreements (see references in footnote 12). Nearly 400 additional Army and DoD Cold War era studies are listed in a 244-page annotated bibliography at <https://www.denix.osd.mil/army-pcwr/>, representing extensive documentation of Army and DoD-wide Cold War era historic properties.

In addition to this extensive documentation of WWII and Cold War era historic properties, the Army will continue preservation management of four NHLs from the WWII and Cold War eras. Those WWII and Cold War era NHLs are Ladd Field NHL District, Fort Wainwright, AK; Launch Complex 33, White Sands Missile Range, NM; The Trinity Site, White Sands Missile Range, NM; and the Opana Radar Site, Kahuku Training Area, HI:

- Ladd Field NHL 1939-1947 period encompasses the establishment of Ladd Field as a critical base for Lend-Lease operations with the Soviet Union during World War II and its subsequent role in early Cold War era research and development, particularly related to Arctic military operations.
- Launch Complex 33 NHL 1945 to 1957 reflects the site's use for the V-2 rocket program after World War II, which was crucial for developing Cold War era rocketry and missile technology in the United States. While its operational lifespan extended beyond 1957, the early years are considered the most significant.
- Trinity Site NHL period of significance is centered around July 16, 1945. This is the date of the Trinity Test, the first detonation of a nuclear weapon. The Trinity test was conducted by the Army on White Sands Missile Range at 5:29 a.m., July 16, 1945, as part of the Manhattan Project.
- Opana Radar Site NHL period of significance is December 7, 1941. This single date

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<sup>19</sup> Referenced NHPA compliance agreements are located at <https://www.denix.osd.mil/army-cr/army-dod-comments>.

marks when the radar site detected the incoming Japanese air attack on Pearl Harbor. While the detection was not effectively communicated in time to prevent the attack, the site represents the earliest warning of the attack and its role in the events of that day.

Associated built infrastructure constructed during the WWII and the Cold War periods (1941-1989) has been extensively documented, and the most significant representative properties in the Army inventory are preserved and managed as NHLs under this program comment. Any effects of warfighting readiness activities and management actions on all non-NHL Army WWII and Cold War era associated infrastructure are mitigated by extensive documentation and by the preservation of period NHL properties. Therefore, there are no further NHPA Section 106 requirements or reviews, special building material requirements, design considerations, or special historic preservation procedures required for management actions on all non-NHL Army WWII and Cold War period properties. Any potential adverse effects to designated Army NHLs from the WWII and Cold War periods will follow the higher-level consideration and review procedures for NHLs in this program comment.

### **6.2.5. Management of Army NHLs**

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.

There are 20 designated NHLs located on Army installations, including both individual NHL properties and NHL districts. The Army's NHLs were constructed by the Army and continue to serve the Army's national defense mission. NHL districts at Fort Huachuca, Palm Circle, Fort Leavenworth, Fort Myer, and Fort Sill include Army family housing districts addressed under the Army's historic housing program comments. Of the five NHLs that date from the WWII and Cold War periods (asterisked in the list below) four are covered by this program comment. The fifth, Pioneer Deep Space Station, Fort Irwin, CA is managed by National Aeronautics and Space Administration under their NHPA Section 106 PA for that property.

- Ladd Field NHL District, Fort Wainwright, AK\*
- Fort Huachuca NHL District, Fort Huachuca, AZ
- Pioneer Deep Space Station, Fort Irwin, CA\*
- National War College, Fort McNair, DC
- Yuchi Town Archeological Site, Fort Benning, GA
- Palm Circle NHL District, Fort Shafter, HI
- Wheeler Field NHL District, Schofield Barracks, HI
- Fort Des Moines NHL District, Des Moines, IA (Army is only responsible for specific contributing buildings)
- Rock Island Arsenal NHL District, Rock Island Arsenal, IL
- Fort Leavenworth NHL District, Fort Leavenworth, KS
- Launch Complex 33, White Sands Missile Range, NM\*
- Trinity Site, White Sands Missile Range, NM\*
- Watervliet Arsenal NHL District, Watervliet Arsenal, NY

- West Point NHL District, US Military Academy, West Point, NY
- Fort Sill NHL District, Fort Sill, OK
- Carlisle Indian School NHL District, Carlisle Barracks, PA
- Fort Douglas NHL District, Salt Lake City, UT (transfer out of Army ownership is currently underway and once completed this will no longer be an Army NHL)
- Fort Myer NHL District, Fort Myer, VA, and
- Quarters 1, Fort Myer, VA.
- Opana Radar Site, Kahuku Training Area, HI\*

NHPA Section 306107 *Planning and actions to minimize harm to National Historic Landmarks* states that prior to the approval of any undertaking that may directly and adversely affect an NHL, federal agencies 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 / NPS a reasonable opportunity to comment regarding the adverse effect undertaking.

To minimize harm to NHLs to the maximum extent possible, the Army will implement section 4(k) of the Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs (63 FR 20496) pertaining to NHLs. Per the Secretary's NHL guideline at 4(k), when alternatives to avoid an adverse effect to NHLs appear to require undue cost or compromise the undertaking's goals and objectives, the agency will balance those goals and objectives with the intent of Section 306107 of the NHPA.

Army installations will implement this higher standard of care for NHLs through careful planning to avoid adverse effects to NHLs. Where adverse effects to NHLs are unavoidable, installations and Commands will prepare and submit a treatment plan for the adversely effected NHL through their chain of command to the Army FPO. The NHL treatment plan will indicate why the adverse effect is unavoidable, identify the appropriate mitigation measure identified in this program comment to minimize harm to the NHL, and the cost and timeframe to implement the mitigation.

The FPO will notify and invite the ACHP and NPS to participate in a 30-day consultation to resolve adverse effects to NHLs. The Army FPO will consider all written comments from the ACHP and NPS and may require installations and Commands to revise NHL treatment plans in consideration of the views provided by the ACHP and NPS. Prior to taking any action that adversely effects an NHL, the Command and installation must receive the FPO's written endorsement of the NHL treatment plan. The approved treatment plan will be made available to the ACHP and NPS for their information.

#### **6.2.6. Mitigation Measures for Adversely Effected Historic Properties**

The Army strives to avoid adverse effects to historic properties. Where adverse effects to historic properties cannot be avoided, the affected property will be subject to a treatment plan developed by the installation. Treatment plans shall be technically and financially feasible and focus on mitigation of the adverse effect to the historic properties affected by a warfighting readiness undertaking. Commands will review and approve treatment plans for all non-NHL properties.

Treatment plans for NHLs require higher level review and approval by the Army FPO as specified in this program comment. Installation treatment plans addressing adverse effects to properties of traditional religious and cultural importance will be developed in consultation with Federally recognized Tribes and NHOs ascribing significance to the historic property prior to coordination with the Commands. Once completed, mitigation documents resulting from the treatment plan will be made available via an installation public web site to the ACHP, SHPOs, THPOs, Tribes, and NHOs as appropriate, for informational purposes. Mitigation documents are subject to operational security review and will be retained by the installation in accordance with Army document management and retention requirements. Specific locational information for sensitive historic properties is on a need to know basis and generally will not be disclosed.

**Standard mitigation measures for buildings, structures, districts, and landscapes.**

Installations will address adverse effects to buildings, structures, districts, and landscapes associated with warfighting readiness activities that are significant under National Register criterion C through documentation prepared to the standards of the Historic American Building Survey (HABS), Historic American Engineering Record (HAER), Historic American Landscapes Survey (HALS) standards, or to equivalent State standards, as appropriate. Where such properties are significant under other National Register criteria, historical documentation appropriate to the significance will be prepared.

**Standard mitigation measures for archeological sites.** To address adverse effects on archaeological sites and districts, installations will implement standard mitigation measures. These may include: (1) avoidance; (2) site protection measures like capping or signage; (3) archaeological monitoring of ground-disturbing activities; or (4) data recovery excavations. All data recovery excavations will be conducted in consideration of the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, as well as state-specific standards. For archeological sites that are properties of traditional religious and cultural importance to Tribes and NHOs, indigenous knowledge-informed mitigation will occur in accordance with the following section regarding mitigation measures for historic properties of traditional religious and cultural importance. If data recovery is pursued, an archeological site data recovery report will be prepared.

**Mitigation measures for properties of traditional religious and cultural importance.** The Army recognizes that standard mitigation measures may not always be applicable to properties of traditional religious and cultural importance to Federally recognized Tribes and NHOs. To ensure Indigenous Knowledge-informed treatment occurs, installations will develop treatment plans for adverse effects to properties of traditional religious and cultural importance to Federally recognized Tribes through government-to-government consultation with the tribe(s) ascribing significance to the property. Installations will develop treatment plans with mitigation measures for adverse effects to properties of traditional religious and cultural importance to NHOs in consultation with the NHO(s) ascribing significance to the property. For defined landscape areas that are considered historic properties of traditional religious and cultural importance, the Army may, as a mitigation measure, prepare ethnographic studies in coordination with Federally recognized Tribes or NHOs. These actions will be conducted following this program comment's requirements for consultation with Federally recognized Tribes and NHOs.

**Alternative mitigation measures.** The Army may implement alternative mitigation measures in lieu of the standard mitigation measures for any adversely effected historic property. Alternative mitigation involves mitigative measures applied to properties other than those directly affected by the undertaking, or another type of creative mitigation. Army may implement alternative mitigation on installations, Army owned and leased property, federal lands withdrawn for Army military purposes, state lands used for federal activities, and on properties with conservation easements established under the Army REPI program. Alternative mitigations will be included in treatment plans. Alternative mitigation measures shall not occur when standard mitigation measures are applicable. Alternative mitigation measures must be technically and financially feasible.

**Avoidance of duplication of effort for pre-1941 built infrastructure.** In constructing its extensive military infrastructure, the Army used standardized designs and plans for buildings, structures, districts, landscapes, and for entire installations.<sup>20</sup> The result of Army standardization is that the same designs for buildings, structures, districts, landscapes, housing, and overall installation designs are repeated, one after the other, on Army installations. The Army's pre-1941 built infrastructure was constructed following Army standardized plans; therefore, Army installations will avoid duplicating mitigation efforts for built infrastructure associated with warfighting readiness activities. When developing a treatment plan for mitigation of adverse effects to pre-1941 built infrastructure, installations and commands will determine if similar building, structure, district, or landscape has been previously documented or if known better-preserved examples exist on the installation or elsewhere. If prior documentation or better-preserved examples sufficiently represent the adversely affected property, that information will be incorporated into the treatment plan to minimize redundant mitigation efforts.

#### **6.2.7. Consultation with Federally Recognized Tribes and Native Hawaiian Organizations**

Tribal sovereignty is the basis of the exclusive government-to-government relationship between Federally recognized Tribes and the Federal government. The government-to-government relationship between the Army and Federally recognized Tribes transcends the NHPA Section 106 process.

Army installations have ongoing government-to-government relationships with Federally recognized Tribes. Army installations in Hawaii have ongoing respectful consultative relationships with NHOs. Through these ongoing relationships, the Army will address the significance that Federally recognized Tribes and NHOs ascribe to historic properties of traditional religious and cultural importance.

The Army strives to avoid adverse effects to historic properties of traditional religious and cultural importance. Installations will consult with Federally recognized Tribes and NHOs to identify the locations of historic properties of traditional religious and cultural importance located on Army installations and facilities for the purposes of avoidance of adverse effects. The

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<sup>20</sup> Context Study of the United States Army Quartermaster General Standardized Plans 1866-1942. US Army Corps of Engineers, Seattle District, 1997. A Study of United States Army Family Housing Standardized Plans, Volumes 1-5, Beth Grashof, Georgia Institute of Technology, 1986. National Historic Context for Department of Defense Installations, 1790-1940, Volumes 1-4. Referenced studies are found at <https://www.denix.osd.mil/army-pchh/>.

Army is committed to protecting the confidentiality of any sensitive site information, Indigenous Knowledge, or other culturally sensitive information provided by Federally recognized Tribes and NHOs.

When a proposed warfighting readiness activity will adversely affect known historic properties of traditional religious and cultural importance to Federally recognized Tribes or NHOs, and those effects cannot be avoided, installations will consult with Tribes or NHOs for a 60 calendar day period to inform the development of mitigation measures. Mitigation measures for the affected property recommended during consultation will be considered in the preparation of the treatment plan. If mitigation of the affected property is not technically or financially feasible the installation, in coordination with affected Tribes or NHOs, may develop alternative mitigation measures in accordance with this program comment. Undertakings will proceed following the 60-day tribal or NHO consultation period in a manner allowing for completion of mitigation measures in the approved treatment plan.

#### **6.2.8. Inadvertent Discovery**

The discovery of a historic property during implementation of warfighting readiness activities will be addressed by the Army following the procedures in this section. If the discovery involves Native American or Native Hawaiian cultural items or human remains, the Native American Graves Protection and Repatriation Act (NAGPRA) and 43 CFR 10 will be followed in lieu of this program comment and 36 CFR 800.

If an undertaking covered by this program comment has commenced and discovery of a non-NAGPRA historic property occurs, activities will cease in the immediate area of the discovery. If avoidance of further effects is not possible, the installation and command will determine a technically and financially feasible mitigation measure prescribed in this program comment to resolve any adverse effect. Within 48 hours of the discovery, the installation will notify their chain of command and any Federally recognized Tribe or NHO that might attach religious and cultural significance to the affected property. The notification will describe the Army's assessment of National Register eligibility of the property and indicate, as needed, a technically and financially feasible mitigation measure or alternative mitigation measure as provided for in this program comment. The Federally recognized Tribe or NHO shall respond within 48 hours of the Army's notification. The installation shall take into account their recommendations regarding National Register eligibility and proposed actions and then carry out appropriate actions. If there is no Federally recognized tribe or NHO response within 48 hours of the notification, the installation will carry out the mitigation measure as needed, inform the appropriate Federally recognized tribe or NHO, and report the action in their annual report.

If the undertaking has commenced and a discovery of a historic property is made that does not involve a property of religious and cultural significance to any Federally recognized tribe or NHO, activities will cease in the immediate area of the discovery. If avoidance of further effects is not possible, the installation will notify their chain of command within 48 hours of the discovery. The installation will, as needed, determine a technically and financially feasible mitigation measure or alternative mitigation measure as prescribed in this program comment to

resolve any adverse effect. The installation will implement any command recommendations, will carry out the mitigation measure, and report the action in their annual report.

### **6.2.9. Army Readiness and Environmental Protection Integration (REPI) program**

Encroachment from increasing development near Army installations can restrict military access to land, air, and water, hindering realistic training and testing activities crucial for warfighting readiness. The Army REPI program utilizes authorities provided under 10 U.S.C. § 2684a, 16 U.S.C. § 670c-1, and 10 U.S.C. § 2679 to mitigate encroachment pressures on warfighting readiness activities.

This program comment shall be applied to meet all Section 106 compliance requirements for the Army REPI program and its actions. The Army REPI program places conservation easements on properties outside installation boundaries to protect the Army's warfighting readiness activities from encroachment. Because these are typically in-perpetuity conservation easements that restrict development, Army REPI program action's effects on historic properties are generally not adverse. In fact, the Army REPI program has led to the successful in-perpetuity preservation of off-installation historic properties and sacred landscapes.<sup>21</sup> Historic properties located within Army REPI conservation easements may be used for the purposes of alternative mitigation under this program comment.

### **6.2.10. National Mitigation Areas**

National Mitigation Areas are designated locations where the Army has a commitment to long-term stewardship of significant historic properties beyond the requirements of the NHPA. These areas, which include two National Monuments recently designated under the authority of the Antiquities Act (54 US Code § 32030) and a Native Hawaiian property of traditional religious and cultural importance, contain a high concentration of valuable historic, prehistoric, and traditional cultural properties. Since these areas encompass a wide array of historic Army buildings, archaeological sites, historic districts, properties of traditional religious and cultural importance to Federally recognized Tribes and NHOs, sacred landscapes, and significant natural resources and geological features, the National Mitigation Areas serve as enduring mitigation for this program comment.

**Carlisle Federal Indian Boarding School National Monument, Carlisle Barracks, PA:** The Carlisle Federal Indian Boarding School National Monument was established under the authority of the Antiquities Act at the Army's Carlisle Barracks in December 2024 (89 FR 100289). The Army, recognizing the profound cultural significance of the Carlisle Indian Industrial School to Federally recognized Tribes, partnered with the Department of the Interior in this National Monument designation. The school's former campus is located within Carlisle Barracks, an Army installation with a history dating back to the Revolutionary War. The Barracks saw limited use by the Army following the Civil War. In 1879, Congress authorized the Secretary of War to

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<sup>21</sup> See program successes at <https://www.achp.gov/success-stories/fort-ap-hill> "Collaboration Leads to Creative Off-Site Mitigation Solution", Fort A.P. Hill, Caroline County, Virginia; and <https://www.oha.org/wp-content/uploads/Attachment-6-OHA-Kukaniloko-Information-Sheet.pdf> "Kūkaniloko" Office of Hawaiian Affairs. (Note - the Army REPI program was previously referred to as the Army Compatible Use Buffer program).



transfer vacant military posts to the Secretary of the Interior for industrial training of Indian youth, including Carlisle Barracks, leading to the school's establishment in 1879. The Carlisle Indian School was the Nation's first off-reservation Federal Indian boarding school. From 1879 to 1918, over 7,800 children from 140 Tribes attended the Carlisle School. After the Department of the Interior closed the Carlisle Indian School, Carlisle Barracks was transferred back to the Army. While under Army stewardship the former Carlisle Indian School campus was designated as an NHL district in 1961. The 24 NHL historic structures associated with the Carlisle Indian School include residential, vocational, and athletic buildings that evoke the Federal Indian boarding school era. The National Park Service now collaborates with the Army and others to share the story of the school (see <https://www.nps.gov/cibs/index.htm>).

**Castner Range National Monument, Fort Bliss, TX:** Established on Fort Bliss in March 2023 under the authority of the Antiquities Act (88 FR 17999), the Castner Range National Monument encompasses 6,672 acres. The Army ensures the protection of sacred sites, properties of traditional religious and cultural importance, and natural ecosystems within the Castner Range National Monument (<https://www.denix.osd.mil/crnm/>). Castner Range remains undeveloped with historic properties preserved due to its history of military use. Since the cessation of live-fire exercises over half a century ago, Castner Range, under Fort Bliss stewardship, has reverted to a natural Chihuahuan Desert ecosystem. Vital springs like Indian Springs, Cottonwood Springs, Mundy Springs, and Whispering Springs provide water sources and rare habitat for wildlife. There are 41 prehistoric archeological sites on Castner Range containing pit houses, roasting pits, ceramics, and other archeological features and artifacts. The Army has listed archeological districts and sites on Castner Range in the National Register of Historic Places, including the Fusselman Canyon Rock Art District, the Northgate Site, and the Castner Range Archeological District. To ensure management decisions reflect Indigenous Knowledge, the Army will engage with Tribes having cultural affiliation with the area in developing a management plan for the National Monument.

**500 Acre Conservation Easement Protecting Kūkaniloko, O‘ahu, HI:** Kūkaniloko is one of the most sacred Native Hawaiian places and is found within the cultural landscape of the Wahiawā Plateau on O‘ahu. This area was the royal birth site for high-ranking chiefs, known as ali‘i, and was utilized as a birth site well into the 17th century. Kūkaniloko is believed to be the geographical and spiritual center of O‘ahu and is also spiritually connected to other sacred sites in Hawai‘i (see <https://www.oha.org/wp-content/uploads/Attachment-6-OHA-Kukaniloko-Information-Sheet.pdf>). In 2012 the Hawai‘i State Legislature authorized \$13 million towards the purchase of a conservation easement on 500 acres of sacred landscape surrounding Kūkaniloko for its protection. Army REPI program and its partners including the Trust for Public Land and the Office of Hawaiian Affairs raised the additional \$12 million required for purchase of the easement, which included over \$4.5 million from the Army REPI program. As a result, the Office of Hawaiian Affairs received the 500-acre in-perpetuity easement surrounding Kūkaniloko for long-term conservation. The area is not open to the public and visits must be coordinated through the Hawaiian Civic Club of Wahiawā. The Army REPI program also provides resources for on-going land management needs and conservation activities on the 500-acre easement.

### **6.2.11. National Security Consideration**

Recognizing that national security and warfighting readiness may, in exceptional cases, necessitate deviations from the historic property management procedures in this section, the Army FPO is authorized to intervene and conclude actions that significantly impede warfighting readiness, impact property uses for warfighting readiness purposes, or that may otherwise impact national security. In such cases, alternative mitigation measures will be implemented where financially and technically feasible. Actions taken under this provision by the Army FPO will be reported to the ACHP.

### **6.2.12. Emergency Operations**

In response to a natural disaster, national security emergency, or any other threat to life and property, the Army will take immediate action to respond to the natural disaster, to protect life and property, and to implement national security emergency response actions on or off Army property.

When the national security emergency involves deploying troops to installations within the United States, installations will prioritize support for deployed troops and facilitate their deployment by immediately implementing all necessary supporting actions. Recognizing that such emergency troop deployments limit the feasibility of considering potential effects to historic properties before proceeding; installations will minimize potential effects on known historic properties through avoidance where reasonably possible. Installations will summarize such activities in their annual report for this program comment.

When a national security emergency response involves the designation and use of new military use areas or national defense areas, such national security emergency responses limit the feasibility of considering potential effects to historic properties before proceeding. When practicable during national security emergency responses, the Army may seek readily available geospatial data identifying the locations of known historic properties within the affected areas. Such geospatial data will be provided to the deployed Army units and will indicate known historic property locations as “restricted areas” where military operations should be avoided if feasible. If any military use areas or national defense areas are designated as a new Army installation or become a permanent part of an existing Army installation, that designation and all Section 106 requirements for those areas will be met by following this program comment.

The Army will strive to avoid adverse effects to historic properties during emergency operations. Adverse effects that may occur to historic properties resulting from Army emergency operations are compensated by the preservation of the broad array of historic properties within the National Mitigation Areas identified in this program.

## **7.0. Annual Reporting and Annual Meeting**

On or before January 31<sup>st</sup> of each year, each Army installation with undertakings addressed under this program comment will prepare an annual report for the preceding fiscal year. The installation annual report will identify each undertaking addressed under the program comment

and summarize efforts to identify, evaluate, assess effect, and avoid or mitigate adverse effects to historic properties. The Army installation will publish their annual report on a publicly accessible website, following applicable requirements for information dissemination. When published, the installation will inform relevant SHPOs, THPOs, Tribes, and NHOs that the annual report is available for their information. Specific locational information for sensitive historic properties shall not be disclosed in the annual report. Such annual reporting by Army installations will occur for the duration of this program comment.

After January 31<sup>st</sup> of each year, the Army FPO will meet with the ACHP and ACHP invitees to discuss implementation of the program comment. The Army will review the overall effectiveness of the program comment in meeting its intent and purpose and 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. Annual meetings will occur for the first three years of implementation, and may take place in-person, by phone, videoconference, or any combination of such methods.

## **8.0. Applicability**

The Army shall implement all warfighting readiness activities and management actions on all associated infrastructure in accordance with the terms of this program comment. This program comment shall be applied to all warfighting readiness activities and associated infrastructure that is currently subject to Section 106 review and that may become subject to Section 106 review in the future.

This program comment shall be implemented by the Active Army, Army Reserves, and federally supported warfighting readiness activities of the Army National Guard including their federally supported activities on state properties. This program comment shall be implemented for Section 106 compliance for all Army REPI actions. This program comment shall be applied to all Army warfighting readiness activities and emergency operations that may occur on or off of Army installations and facilities.

This program comment does not apply to Civil Works activities of the US Army Corps of Engineers. If at a future date, the Army reassesses properties previously determined not eligible for inclusion in the NRHP and subsequently determines such properties to be eligible for inclusion in the National Register, Section 106 compliance for those properties shall occur by means of this program comment.

This program comment is a stand-alone NHPA compliance document provided by the ACHP under 36 CFR § 800.14(e). PAs, MOAs, or AAPs shall not be prepared or amended to “implement” the program comment. The terms of the program comment are not subject to any change or further consultation in the context of PAs, MOAs, other program comments, or any other NHPA-related actions. Changes to the terms of the program comment can only be made following the amendment procedures of this program comment.

## **9.0. Notification of Termination of Army PAs, MOAs, and AAPs**

**Notification.** This Federal Register notice constitutes official notification from the ACHP and the Army regarding the intent to terminate all Army NHPA Section 106 PAs, MOAs, and AAPs to which they are party.

**Action Required.** Signatories to the existing Army PAs, MOAs, and AAPs in Appendix E are invited to submit comments regarding this termination notice, as well as any proposed amendments to PAs, MOAs, or AAPs, to the Department of the Army Federal Preservation Officer at [david.b.guldenzopf.civ@army.mil](mailto:david.b.guldenzopf.civ@army.mil) and to all other agreement signatories within thirty (30) days of the date of this Federal Register notice.

**Process.** After the 30-day comment period, the Army FPO will review all comments and proposed agreement amendments received from signatories to Army PAs, MOAs, and AAPs. The Army FPO will notify the ACHP of the Army's final decision either to amend or terminate agreements. If amending, the Army FPO will proceed with the agreement amendment process. If terminating, the Army FPO will notify the ACHP of its decision to terminate. Termination of Army PAs, MOAs, and AAPs is final upon the date of the Army's FPO's written notification of termination to the ACHP. After notifying the ACHP, the Army will publish a public notice of termination in the Federal Register.

**Scope of Termination.** Appendix E of this program comment lists the Army PAs, MOAs, and AAPs subject to this termination notification.

**Effect of Termination.** The terms of terminated PAs, MOAs, and AAPs shall no longer apply to the Army warfighting readiness category of undertakings and associated infrastructure. All current and future Army warfighting readiness activities and management actions on associated infrastructure addressed under terminated PAs, MOAs, and AAPs shall be implemented following the procedures of this program comment. The Army will cease development of new PAs, MOAs, and AAPs and will follow the procedures of this program comment for all current and future warfighting readiness activities and management actions on all associated infrastructure.

## **10.0. Duration**

This program comment will remain in effect until such time as the Army FPO determines that this program comment is 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) and this program comment.

## **11.0. Amendment, Withdrawal, and Consolidation**

**11.1. Amendment.** The ACHP may amend this program comment after consulting with the Army FPO and other parties it deems appropriate, as follows:

**Amendment by Chairman, ACHP.** The Chairman of the ACHP, or Vice-Chairman (when the Chairman position is vacant), may amend this program comment to extend its applicability to the other military departments of the Department of Defense. The ACHP will notify the Army FPO

and will publish notice in the Federal Register regarding such amendment within 30 days after the Chairman/Vice Chairman's issuance of the amendment.

**Other Amendments.** All other amendments to this program comment are subject to agreement by the Army FPO. All such proposed amendments shall be submitted by the ACHP to the Army FPO for consideration and may only be promulgated following ACHP's receipt of the Army FPO's written statement of agreement. The ACHP will publish notice in the Federal Register regarding such other amendments within 30 days after issuance.

**11.2. Withdrawal of the Program Comment.** If the ACHP Chairman determines that undertakings are not being carried out in a manner consistent with this program comment, the ACHP Chairman may propose withdraw the program comment after consultation with the Army FPO. Withdrawal of this program comment by the ACHP requires a majority vote of all eligible voting members of the ACHP. The Chairman will notify the Army FPO and will publish notice in the Federal Register within 30 days of any vote to withdraw. If this program comment is so withdrawn, the Army shall comply with the requirements of 36 CFR § 800.3 – 800.7, or an applicable program alternative, for individual undertakings subject to this program comment.

**11.3. Consolidation of Program Comments.** Recognizing that historic Army housing and warfighting readiness associated infrastructure were planned and developed in a coordinated manner during the same time periods, the Army is authorized to consolidate its program comments to ensure consistent management. Should the Army choose to implement this consolidation, it is authorized to terminate its current program comments pertaining to historic housing<sup>22</sup> and apply this program comment to all historic Army housing, including WWII and Post-WWII era housing (1941-1948), and to housing that may become subject to Section 106 in the future. The Army FPO will notify the ACHP Chairman of its decision to consolidate program comments and will publish a notice in the Federal Register regarding that decision within 30 days of that notification.

## **12.0. Definitions**

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

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

Alternative mitigation means actions taken to offset the unavoidable adverse effects of an undertaking on a historic property. Alternative mitigation may occur when mitigation actions on an adversely effected historic property are not financially or technical feasible, where there are

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<sup>22</sup> Program Comment for Preservation of Pre-1919 Historic Army Housing, Associated Buildings and Structures, and Landscape Features; Program Comment for Department of the Army Inter War Era Historic Housing, Associated Structures, and Landscape Features (1919-1940); Program Comment for Department of the Army Capehart and Wherry Era Army Family Housing, Associated Structures, and Landscape Features (1949-1962); and Program Comment for Department of the Army Vietnam War Era Historic Housing, Associated Buildings and Structures, and Landscape Features (1963–1975).

national security implications, or other extenuating circumstances. Alternative mitigation may occur through other mitigative activities involving other historic properties.

Area of potential effect means the specific, discrete, narrowly delineated geographic area within which an undertaking may directly and physically affect a historic property.

Associated infrastructure means the totality of all built infrastructure and natural infrastructure associated with Army warfighting readiness activities.

Built infrastructure means all buildings, structures, districts, objects, sites, man-made landscapes and landscape features. The built infrastructure includes the entire overall design and layout of Army installations including but not limited to cantonments, training areas, testing areas, ranges, maneuver areas, all buildings, structures, landscapes, landscape features, sites, districts, objects, facilities, research related properties, industrial and manufacturing areas and properties, warehouses, roadways and circulation patterns and systems, rail lines, bridges, dams, utility systems, mechanical systems, airfields, heliports, energy infrastructure, etc. Includes all man-made landscapes and landscape features including archeological sites. See Appendix B for additional detail on Army buildings and structures included in the built infrastructure.

Economic (or Financial) feasibility means the Army's assessment of relevant factors to determine if an action, project, or product to address a historic property are financially viable and sustainable. It considers the costs of building materials, labor, mitigation, among other factors against the available funding and longer-term financial resources to ensure the action is realistic, achievable, and will effectively preserve or document the property's historical value. Financial feasibility see definition of economic feasibility.

Health or safety hazards means land, buildings or structures that have any of the following conditions: violations of health and safety codes and standards; structurally unstable roofs or walls; non-functional or poorly functioning mechanical systems; rodent, insect, or mold infestations, lead based paint exposure risks; asbestos exposure risks; sites contaminated with hazardous substances, pollutants, contaminants, toxic chemicals and materials, or any other environmental hazards; damages due to fire, flooding, or natural disasters; and other conditions that present health hazards or make the land, buildings or structures unsafe.

Historic building materials means building materials that were used in the initial construction of a building, and for designated NHLs it means 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 district or district means the same as the term's definition in 36 CFR 60.3(d). The terms historic district and district are used interchangeably in this program comment.

Historic property means the same as the term's definition in 36 CFR § 800.16(l).

Imitative substitute building materials or substitute building materials means modern, industry standard, natural, composite, and synthetic materials that simulate the appearance of historic materials. They are used as alternatives to historic building materials and in-kind building materials when those materials are not financially or technically feasible, or where other factors such as contamination require replacement of historic building materials. The terms imitative substitute building materials and substitute building materials are used interchangeably for the purposes of this program comment.

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.

Industrial activity means all activities at all Army research laboratories, depots, arsenals, and ammunition plants involved in research, development, manufacturing, storing, maintaining, and disposal of Army weapons and materiel.

Installation means all installations, facilities, and locations where Section 106 is applicable to Army including all aggregations of contiguous or near contiguous, common military mission-supporting real property holdings under the jurisdiction of, or possession or control of the Army and at which an Army unit or activity (Active Army, Army Reserve, or Army National Guard) is assigned and or operates.

Landscape and landscape features includes all plantings and landscaping, gardens, parade grounds, open spaces, recreational landscape features (including but not limited to recreational and athletic fields, playgrounds, golf courses, tennis courts, etc.), fencing, parking areas, garages, signage, site furnishings, parade grounds, lighting, sidewalks and curbing, driveways, setbacks, cemeteries, objects, statuary, monuments, archeological sites and districts, and all human influenced landscapes and landscape features. Includes all visual elements and viewsheds into historic properties and historic districts and out from any historic property or historic districts into other historic properties and districts, and all other landscape features.

Lease, transfer, and conveyance means the execution of documents for real property lease, sale, possession, management, operation, development, conveyance, or transfer of real property into or out of Army ownership, jurisdiction, or management. Includes execution of property transfers and conveyances of ground leases, easements, and property ownership. Includes Enhanced Use Leases (EUL) and all EUL associated development activities, public land withdrawals, and any other form of real property conveyance or transaction. In the event of a conflict or inconsistency between a lease, transfer, or conveyance document and this program comment with respect to the obligations pursuant to Section 106 of the NHPA, the terms of this program comment shall have primacy.

Maintenance and repair means all activities required to maintain the exterior of buildings and structures, mechanical systems, and all 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 exteriors.

Management actions are any and all activities undertaken with respect to all built and natural infrastructure associated with warfighting readiness including but not limited to maintenance, repair, rehabilitation, renovation, additions, new construction, abatement and remediation of health and safety hazards such as lead based paint and asbestos, mothballing, cessation of maintenance, and demolition. This term includes all leasing, acquisition, and disposal of any real property interests whether by purchase, lease, easement, transfer, sale, public land withdrawal, or any other form of real property conveyance, and also applies to such real property actions for Enhanced Use Leases and National Defense Areas. This term covers all military land and resource management activities including but not limited to all natural resources management, cultural resources management, training and testing area land management, natural resource extraction activities including but not limited to mineral exploration and mining activity and timber and other natural resource harvesting activity, removal and/or detonation of unexploded ordnance (UXO) or discarded military munitions; assessment, investigation, and/or implementation of removal or remedial actions to address releases of hazardous substances, pollutants, or contaminants, and any and all other activities on and off Army installations and facilities.

Military landscape means a distinctive type of cultural landscape found on military installations. The military landscape is a holistic concept composed of two components: built infrastructure and natural infrastructure, collectively referred to in this program comment as associated infrastructure. The military landscape encompasses the entirety of each Army installation including the totality of the associated infrastructure. The military landscape is the nationwide context for Army warfighting readiness activities.

Mitigation measure means any action that serves to address, reduce, minimize, monitor, or otherwise mitigate adverse effects on historic properties and may include reports, historical documentation, recordation, other materials and activities, data recovery, avoidance, and compensatory or alternative mitigation measures.

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

National Historic Landmark means exceptional historic properties formally designated by the Secretary of the Interior under the authority of the Historic Sites Act of 1935.

Natural infrastructure means all naturally occurring resources, ecosystems, landscapes and viewsheds, natural features, and any and all other natural resources. The term includes but is not limited to forests, wetlands, rivers, streams, lakes, riparian areas, deserts, grasslands, prairies, all habitats, vegetation, soils, mineral resources, and geological features.

Property of traditional religious and cultural importance means any specific, discrete, narrowly delineated geographic location that is identified by an Indian tribe or NHO as important by virtue of its established religious or cultural importance to a tribe or NHO; provided that the tribe or NHO has informed the Army of the existence of and the specific geographical location of such a property.



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 a property 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, address obsolete, damaged, deteriorated, or defective interior and exterior building materials and elements, fencing, and all 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).

Substitute building materials, see definition of Imitative substitute building materials.

Technical feasibility means the Army's assessment of relevant factors to determine if an action, project, or product is suitable, practical, viable, and can be successfully implemented in consideration of warfighting readiness requirements.

Testing or military testing means activities that evaluate weapons and materiel performance, safety, and reliability.

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

Training or military training means activities that prepare units and Soldiers for combat operations.

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, human influenced features, man-made features, and points beyond the horizon. Includes all visual elements and viewsheds into historic properties and historic districts and out from any historic property or historic districts into other historic properties and districts, and all other landscape features. Viewsheds are addressed under this program comment as part of the military landscape and landscape features.

Warfighting readiness activities means all military training, testing, equipping, and industrial activities and management actions occurring on all infrastructure associated with those activities. This includes all training, testing, equipping, and industrial activities conducted on and off Army installations and facilities, and such activities of other military departments or other federal agencies conducted on Army installations and facilities.

## **13.0. Appendices**

Appendix A – Category of Undertakings

Appendix B – Associated Built Infrastructure

Appendix C – Design Guidelines for Pre-1941 Buildings, Structures, and Landscapes

Appendix D – Building Materials Guidelines and Catalog for Pre-1941 Buildings, Structures,  
And Landscapes  
Appendix E – Army PAs, MOAs, and AAPs

## Appendix A. Warfighting Readiness Category of Undertakings

This appendix provides information on discrete subsets of activities under the warfighting readiness category of undertakings - military training, testing, equipping, and industrial activities. These activities may occur on and off Army installations. All warfighting readiness activities are covered by this program comment, whether or not they are specifically delineated in this appendix.

**Training** - Training includes military maneuvers and exercises. These activities may include ground disturbing activities and management actions on associated infrastructure which may adversely affect historic properties:

- **Mission Essential Task List (METL) Training:** This is the cornerstone of warfighting readiness. Units train to proficiently execute their assigned METL, which are the tasks critical to their wartime mission. This training is progressive, starting with individual skills and building up to collective tasks.
- **Combined Arms Maneuver Training:** Training that integrates different arms (infantry, armor, artillery, aviation, etc.) to achieve a common objective. This emphasizes coordinated movement, fire support, and communication.
- **Live Fire Exercises (LFX):** Essential for building confidence and competence in using weapons systems under realistic conditions. LFXs progress from individual weapon firing to complex combined arms scenarios.
- **Situational Training Exercises (STX):** Focused on specific tactical scenarios, STXs allow units to practice decision-making, execution, and problem-solving in a simulated combat environment.
- **Field Training Exercises (FTX):** Extended exercises conducted in a field environment to simulate the challenges of sustained combat operations. FTXs test a unit's ability to plan, execute, and sustain operations under demanding conditions.
- **Urban Operations Training:** Training in built-up areas to prepare for combat in urban environments, which presents unique challenges.
- **Air Assault Operations Training:** Training to conduct airmobile operations, including helicopter insertions, extractions, and resupply.
- **Breach Training:** Training to overcome obstacles, such as minefields and fortifications, to enable maneuver.
- **Counter-IED (Improvised Explosive Device) Training:** Crucial for mitigating the threat of IEDs, which have been a significant factor in recent conflicts.

- Combat Lifesaver (CLS) Training: Equipping Soldiers with the skills to provide immediate medical care on the battlefield.
- Close Quarters Combat (CQC) Training: Training for fighting in close-range, confined spaces.
- Electronic Warfare (EW) Training: Training to understand and counter enemy electronic warfare capabilities.
- Cyber Warfare Training: Increasingly important training to defend against cyberattacks and conduct offensive cyber operations.
- Joint Training Exercises: Training with other branches of the U.S. military and/or allied forces to improve interoperability and coordination.
- Command Post Exercises (CPX): Simulation-based exercises that focus on training the command and staff functions of a unit.
- Deployment Readiness Training Exercises: Exercises to test the unit's ability to deploy rapidly.
- Emergency Deployment Readiness Exercises (EDRE): Unannounced exercises to test the unit's ability to deploy rapidly.
- Mobilization Training Exercises: Exercises to simulate the process of mobilizing for deployment.
- Combat Training Center (CTC) Rotations (NTC, JRTC): Intensive, realistic training exercises conducted at specialized training centers. These rotations provide units with a rigorous evaluation of their warfighting capabilities.
- Mission Readiness Exercises (MRX): Exercises designed to assess a unit's ability to perform its assigned mission under realistic conditions.
- Internal and External Evaluations: Regular evaluations to assess unit readiness and identify areas where additional training or resources are needed.

**Testing** - Testing undertakings include Army weapons and materiel testing on ranges and in facilities where a wide variety of testing activities occur, all aimed at evaluating the performance, safety, and reliability of weapons systems and materiel. These activities include ground disturbing activities and management actions on associated infrastructure which may adversely affect historic properties:

- Live Fire Testing: This is the most common activity and involves firing weapons of all calibers, and types from small arms to large artillery, at various targets. The purpose is to assess accuracy, range, penetration, lethality, and overall effectiveness. This includes:

- Direct Fire Testing: Testing weapons that are aimed directly at a target.
  - Indirect Fire Testing: Testing weapons that fire over a distance, relying on calculations and adjustments for accuracy.
  - Trajectory Analysis: Tracking the flight path of projectiles and other weapon systems to determine their range, accuracy, and consistency. This often involves sophisticated radar and optical tracking systems.
  - Penetration Testing: Firing rounds at different materials (armor, concrete, etc.) to determine the weapon's ability to penetrate various types of protection.
- Explosive Ordnance Disposal (EOD) Range Testing: Testing procedures and equipment for detecting, neutralizing, and disposing of unexploded ordnance.
  - Extreme Temperature Testing: Exposing weapons and ammunition to extreme heat and cold to ensure they function reliably in all climates.
  - Humidity Testing: Evaluating the effects of high humidity on weapon performance, corrosion resistance, and ammunition stability.
  - Rain and Sand/Dust Testing: Simulating harsh weather conditions to assess the weapon's ability to function in adverse environments. This can involve rain towers, sandstorms, and dust chambers.
  - Salt Fog Testing: Evaluating the corrosion resistance of weapons systems when exposed to saltwater environments, simulating maritime operations.
  - Vibration and Shock Testing: Simulating the vibrations and shocks that weapons systems might experience during transport, handling, and use.
  - Endurance Testing: Firing weapons for extended periods to assess their durability and identify potential failure points. This can involve thousands of rounds being fired in rapid succession.
  - Component Testing: Testing individual components of a weapon system (e.g., firing mechanisms, sights, barrels) to identify weaknesses and ensure they meet performance standards.
  - Maintenance and Repair Testing: Evaluating the ease of maintenance and repair of weapons systems, including the tools and procedures required.
  - Usability Testing: Evaluating how easily and effectively soldiers can operate and maintain a weapon system. This includes assessing factors such as ergonomics, user interface, and training requirements.

- **Safety Testing:** Identifying and mitigating potential safety hazards associated with weapon systems. This includes testing for accidental discharge, malfunction, and other potential risks.
- **Performance Under Stress Testing:** Evaluating how soldiers perform with a weapon system under stressful conditions, such as fatigue, sleep deprivation, and exposure to combat noise.
- **Electromagnetic Interference (EMI) Testing:** Evaluating the susceptibility of weapons systems to electromagnetic interference from other electronic devices.
- **Electronic Countermeasures (ECM) Testing:** Testing the effectiveness of countermeasures designed to protect weapons systems from electronic attacks.
- **Cybersecurity Testing:** Assessing the vulnerability of networked weapons systems to cyberattacks.
- **Target Acquisition and Tracking:** Testing the ability of sensors and weapon systems to acquire, track, and engage targets.
- **Sensor Performance Testing:** Evaluating the performance of sensors such as radar, infrared cameras, laser rangefinders, and detection systems.
- **Target Signature Management:** Assessing the effectiveness of techniques to reduce the signature of targets, making them harder to detect.
- **Range Safety:** Ensuring the safety of all personnel and equipment on the range. This includes establishing safety zones, safety shelters, enforcing safety procedures, and providing emergency medical services.
- **Training Area and Test Range management.** This includes Integrated Training Area Management (ITAM) activities and all other land management activities.
- **Target Preparation and Maintenance:** Preparing and maintaining targets for testing. This includes setting up targets, repairing damage, and collecting data on target impact.
- **Logistics and Support:** Providing logistical support for testing activities, including transportation, fuel, ammunition, maintenance services, and instrumentation.
- **Materiel Testing:** Research, development, test, and evaluation (RDT&E) of a variety of equipment and processes such as protective equipment, decontamination, detection systems, obscurants, and hazard monitoring.

**Equipping** encompasses activities associated with providing Soldiers and units with the necessary materiel, systems, and resources to successfully accomplish their assigned missions. Equipping is a critical function that directly impacts the readiness and effectiveness of the Army. These activities may include ground disturbing activities and management actions on associated infrastructure which may adversely affect historic properties and include:

- Requirements Determination & Acquisition:
  - Identifying Needs: This involves analyzing missions, identifying capability gaps, and defining what equipment is needed to fill those gaps.
  - Market Research: This involves attending industry events, reviewing commercial products, and conducting preliminary testing of potential solutions.
  - Developing Requirements Documents: Formally outlining the required performance characteristics, features, and technical specifications of the equipment. This includes everything from weight and size to power requirements and environmental tolerances. These documents guide the acquisition process.
  - Acquisition Planning: Developing a strategy for acquiring the equipment. This involves choosing the appropriate acquisition pathway (e.g., traditional procurement, rapid fielding), determining funding sources, and establishing a timeline for delivery.
  - Source Selection/Contracting: Issuing solicitations to potential vendors, evaluating proposals, and awarding contracts to the best offeror(s). This is a highly regulated process designed to ensure fairness and transparency.
  - Prototyping and Testing: Developing and testing prototypes to validate design concepts, assess performance, and identify potential issues before committing to large-scale production. This phase often involves soldier feedback and rigorous field testing.
- Supply Chain Management & Distribution:
  - Manufacturing and Production: Once a design is finalized and a contract awarded, the manufacturer begins producing the equipment.
  - Warehousing and Storage: Receiving, inspecting, and storing equipment at designated warehouses and depots. Maintaining proper inventory levels and ensuring equipment is stored in accordance with environmental requirements.
  - Distribution Planning: Determining how to distribute equipment to units based on their operational needs, deployment schedules, and priorities.

- Transportation: Moving equipment from warehouses and depots to units, both domestically and internationally. This involves coordinating transportation modes (e.g., trucks, trains, ships, aircraft) and managing logistics.
- Issue: Formally issuing equipment to soldiers and units, documenting the transaction, and ensuring accountability. This involves matching the right equipment to the right personnel based on their roles and responsibilities.
- Sustainment and Maintenance:
  - Field Maintenance: Performing routine maintenance and repairs on equipment in the field. This includes tasks like cleaning, lubrication, adjustments, and minor component replacements.
  - Depot Maintenance: Conducting more extensive repairs and overhauls at specialized maintenance facilities. This often involves replacing major components, restoring equipment to original specifications, and extending its service life.
  - Supply Support: Providing replacement parts, components, and consumables to support maintenance activities. This involves managing inventory levels, forecasting demand, and procuring spare parts from vendors.
  - Technical Manuals & Training: Developing and distributing technical manuals and providing training to soldiers on how to operate, maintain, and repair equipment.
  - Modification and Upgrades: Modifying or upgrading existing equipment to improve its performance, enhance its capabilities, or address emerging threats. This can involve adding new features, replacing obsolete components, or enhancing security.
- Accountability and Disposal:
  - Tracking and Accountability: Maintaining accurate records of all equipment, from procurement to disposal. This involves using tracking systems to monitor equipment location, usage, and maintenance history.
  - Inventory Management: Conducting regular inventories to verify the accuracy of equipment records and identify any discrepancies.
  - Disposal: Properly disposing of equipment that is no longer needed or is beyond repair. This involves following environmental regulations and ensuring that sensitive information is securely erased from electronic devices.
  - Turn-in/Reassignment: Transferring equipment from one unit to another as needs change. This ensures efficient use of resources and minimizes the need for new purchases.



**Industrial activities** include research, development, testing, evaluation, manufacturing, storing, maintaining, shipping, disposing of Army materiel, and all other activities conducted at Army laboratories, depots, arsenals, ammunition plants, and other locations. These organic industrial base (OIB) activities are a vital asset that supports the readiness and effectiveness of the Army by providing a wide range of manufacturing, maintenance, research, and logistics capabilities. These activities may include ground disturbing activities and management actions on associated infrastructure which may adversely affect historic properties and include:

- Manufacturing/Production:
  - Component Manufacturing: Producing specific parts and components for weapon systems, vehicles, and other equipment. This often involves machining, casting, forging, and other specialized manufacturing processes. Examples include producing replacement parts for tanks, aircraft engines, or artillery systems.
  - Ammunition Production: Manufacturing a wide range of ammunition, from small arms rounds to artillery shells and missile components. This involves complex chemical processing, assembly, and quality control procedures. This is a critical capability for wartime surge capacity.
  - Prototype Development: Designing and building prototypes of new equipment and systems. This allows the Army to test and evaluate new technologies before committing to large-scale production.
  - Specialized Tooling & Fixtures: Designing and manufacturing specialized tools, jigs, and fixtures needed for maintenance and production activities within the OIB and for use by field maintenance teams.
- Maintenance, Repair, and Overhaul (MRO):
  - Depot Maintenance: Conducting in-depth repairs and overhauls of weapon systems, vehicles, and other equipment that are beyond the capabilities of field maintenance units. This often involves disassembling equipment, inspecting components, replacing worn or damaged parts, and reassembling the equipment to like-new condition. Examples include rebuilding tank engines, overhauling helicopters, or repairing artillery pieces.
  - Reset: Restoring equipment that has been heavily used or damaged during combat operations to a fully mission-capable condition. This is a major activity following deployments and involves comprehensive inspections, repairs, and upgrades.
  - Service Life Extension Programs (SLEP): Extending the service life of existing equipment by upgrading components, improving performance, and addressing obsolescence issues. This is a cost-effective alternative to replacing entire systems.

- Calibration and Repair of Test Equipment: Maintaining and repairing the sophisticated test and measurement equipment used throughout the OIB and by field units. This ensures accurate testing and calibration of equipment.
- Research, Development, and Engineering (RD&E):
  - Technology Development: Conducting research and development to improve existing equipment and develop new technologies for future weapon systems.
  - Engineering Support: Providing engineering expertise to support manufacturing, maintenance, and repair activities. This includes developing technical drawings, troubleshooting problems, and designing modifications.
  - Materials Testing and Analysis: Analyzing the properties of materials used in Army equipment to identify potential weaknesses and improve performance.
  - Reverse Engineering: Disassembling and analyzing foreign equipment to understand its design and capabilities. This information can be used to develop countermeasures and improve US Army equipment.
  - Manufacturing Technology (ManTech) Development: Improving manufacturing processes and technologies to reduce costs, improve quality, and increase production efficiency. This is crucial for maintaining the competitiveness of the OIB.
- Logistics and Supply Chain Management:
  - Warehousing and Storage: Storing critical parts, components, and materials needed for manufacturing, maintenance, and repair activities.
  - Supply Chain Management: Managing the flow of materials and components from suppliers to the OIB and from the OIB to Army units.
  - Transportation: Transporting equipment and materials between OIB facilities and other locations.
  - Inventory Management: Maintaining accurate records of all inventory and ensuring that critical items are available when needed.

## Appendix B. Associated Built Infrastructure – Buildings and Structures

### ALL ASSOCIATED BUILDINGS AND STRUCTURES 45 YEARS AND OLDER

Categories	Building/Structure Type	Number of Buildings	Number of Structures	Number of Linear Structures	Grand Total
Category 1	Operational and Training	6856	9178	1809	17843
Category 2	Maintenance and Production	4247	81	0	4328
Category 3	Research, Development, Test, and Evaluation	1237	1042	1	2280
Category 4	Supply	22380	3470	4	25854
Category 5	Hospital & Medical	322	0	0	322
Category 6	Administrative	2187	2603	0	4790
Category 7	Housing & Community	8046	2941	11	10998
Category 8	Utility & Ground Improvements	1701	10083	43730	55514
<b>Totals</b>		46976	29398	45555	121929

### SUBSET OF BUILDINGS AND STRUCTURES CONSTRUCTED PRIOR TO 1941

Categories	Building/Structure Type	Number of Buildings	Number of Structures	Number of Linear Structures	Grand Total
Category 1	Operational and Training	596	579	13	1188
Category 2	Maintenance and Production	250	2	0	252
Category 3	Research, Development, Test, and Evaluation	87	57	0	144
Category 4	Supply	876	62	0	938
Category 5	Hospital & Medical	59	0	0	59
Category 6	Administrative	520	142	0	662
Category 7	Unaccompanied Barracks & Community	936	431	0	1367
Category 8	Utility & Ground Improvements	118	771	4488	5377
<b>Totals</b>		3442	2044	4501	9987

\*Best available information as of 7 July 2025

## Categories of Associated Built Infrastructure – Buildings and Structures

Buildings and structures are categorized in the Army real property inventory into eight categories: operational and training; maintenance and production; research, development, test, and evaluation; supply; hospital & medical; administrative; unaccompanied personnel housing and support; utility & ground improvements. All associated infrastructure is covered by this program comment, whether or not it is specifically delineated in this appendix.

**Category 1. Operational and Training:** This category encompasses the range of facilities supporting military operations, training, and infrastructure. It includes communication and information technology centers, air and sea operations buildings, training facilities (classrooms, firing ranges, simulators), headquarters and administrative buildings, academic and general instruction buildings, logistics and maintenance buildings, safety and security structures, and reserve component centers. The facilities support a wide array of activities from command and control to academic and technical training, and operational readiness.

- **Predominant Current Use Category Code (Catcode) Examples:** includes but not limited to 11110, 11111, 11120, 11121, 11130, 11131, 11150, 11151, 11212, 11213, 11221, 11222, 11310, 11311, 11320, 11321, 11330, 11340, 11350, 11351, 11370, 11380, 11610, 12110, 12120, 12210, 12310, 12311, 12312, 12322, 12411, 12412, 12413, 12450, 12451, 12452, 12454, 12455, 12460, 12461, 12470, 12471, 12473, 12480, 12481, 12482, 12483, 12495, 12620, 12621, 12630, 12640, 13115, 13120, 13125, 13131, 13135, 13140, 13160, 13170, 13175, 13181, 13185, 13220, 13252, 13310, 13320, 13410, 13430, 13440, 13450, 13470, 13610, 13612, 13613, 13615, 13620, 13621, 13670, 13710, 14110, 14111, 14112, 14113, 14114, 14115, 14116, 14121, 14126, 14129, 14132, 14133, 14140, 14150, 14160, 14161, 14162, 14163, 14164, 14165, 14166, 14169, 14170, 14171, 14175, 14176, 14177, 14178, 14179, 14180, 14181, 14182, 14183, 14184, 14185, 14186, 14187, 14188, 14190, 14310, 14915, 14916, 14920, 14925, 14935, 14937, 14940, 14953, 14955, 14958, 14960, 14961, 14962, 14963, 14970, 14971, 14975, 15110, 15210, 15410, 15430, 15432, 15510, 15610, 15930, 16310, 16420, 16430, 16440, 17115, 17119, 17120, 17121, 17122, 17123, 17125, 17131, 17132, 17133, 17134, 17135, 17136, 17137, 17138, 17139, 17140, 17141, 17142, 17170, 17180, 17210, 17211, 17212, 17213, 17214, 17710, 17711, 17720, 17721, 17730, 17731, 17771, 17801, 17802, 17803, 17804, 17805, 17806, 17808, 17809, 17810, 17811, 17812, 17813, 17814, 17816, 17821, 17822, 17823, 17829, 17831, 17832, 17833, 17834, 17841, 17842, 17844, 17845, 17851, 17852, 17854, 17855, 17856, 17857, 17858, 17859, 17860, 17861, 17862, 17863, 17864, 17865, 17866, 17867, 17868, 17871, 17872, 17878, 17879, 17880, 17881, 17882, 17883, 17884, 17885, 17886, 17887, 17888, 17891, 17892, 17893, 17894, 17895, 17896, 17897, 17898, 17901, 17902, 17908, 17910, 17911, 17912, 17914, 17948, 17949, 17950, 17951, 17952, 17954, 17955, 17958, 17959, 17961, 17962, 17963, 17964, 17965, 17966, 17971, 17972, 17974, 17976, 17979, 17980, 17981, 17982, 17983, 17984, 17987, 17991, 17992, 17993, 17994, 17995, 17996, 17998, 17999
- **Examples:** includes but not limited to Fixed Wing Runway, Paved; Runway / Fixed Wing - Unsurfaced; Rotary Wing Landing Pad, Unpaved; Fixed Wing Taxiway, Unpaved;

Rotary Wing Parking Apron, Paved; Aircraft Maintenance Parking Apron, Paved; Aircraft Runway Holding Apron, Unpaved; Liquid Propane Gas Storage Tank, Above Ground; Pol Pipeline, Underground; Communication Lines, Above Ground; Flight Control Tower; Airfield Operations Building; Weather Station; Munitions Operations Management Building; Fueling/Pol/Wash Support Facility; Land Vehicle Fueling Facility, Ethanol 85 (E-85); Aircraft Fuel Storage Tank, Jet, Above Ground; Land Vehicle Fuel Storage Tank, Mogas, Underground; Radio Beacon; Instrument Landing System; Runway Lighting; Visual Approach Slope Indicator; Aircraft Arresting System; Vehicle Test Track; Vehicle Defueling Facility; Pier; Bulkheads; Range Operations And Storage Building; Maneuver/Training Area, Heavy Forces; Impact Area Dugged; Automated Field Fire (Aff) Range; Known Distance (KD) Range; Machine Gun Field Fire Range; Light Antiarmor Weapons (Law/At-4) Range Live; Field Artillery Scaled Range; Air Defense Gunnery Range; Live Fire Exercise Shoothouse; Hand Grenade Qualification Course (Nonfiring); Engineer Qualification Range, Nonstandardized; Leadership Reaction Course; Mine Warfare Area; Ship Loading And Unloading Mockup; Fire Fighting And Rescue Training Area; Personnel/Equipment Drop Zone; Obstacle Course; Land Navigation Course; Access Control Facility; Information Systems Facility; Simulations Center; Observation Tower.

**Category 2 - Maintenance and Production:** This category includes maintenance and production facilities supporting military equipment, vehicles, and weaponry. It encompasses aircraft maintenance hangars and shops, vehicle maintenance facilities ranging from small arms repair to heavy gun shops, and specialized facilities for missiles, electronics, and radar. Furthermore, it includes production plants for ammunition, explosives, and various weapon components, as well as quality assurance and calibration facilities to ensure operational readiness.

- **Predominant Current Use Catcodes:** includes but not limited to 21110, 21113, 21114, 21115, 21117, 21120, 21130, 21140, 21210, 21330, 21340, 21406, 21407, 21408, 21409, 21410, 21411, 21412, 21413, 21414, 21415, 21416, 21417, 21418, 21419, 21435, 21440, 21441, 21445, 21458, 21462, 21470, 21510, 21520, 21522, 21530, 21540, 21610, 21612, 21622, 21630, 21632, 21640, 21642, 21650, 21660, 21670, 21710, 21712, 21730, 21835, 21840, 21845, 21850, 21855, 21865, 21870, 21872, 21879, 21881, 21882, 21885, 21887, 21910, 21922, 21925, 22125, 22210, 22410, 22412, 22430, 22510, 22525, 22530, 22535, 22537, 22548, 22610, 22612, 22616, 22618, 22620, 22622, 22624, 22625, 22626, 22628, 22630, 22635, 22638, 22640, 22650, 22655, 22660, 22665, 22670, 22680, 22685, 22810, 22930, 22960
- **Examples:** includes but not limited to Fixed Crane, Aircraft Maintenance Hangar, Aircraft Parts Storage, Vehicle Maintenance Facility, Depot Level, Munitions Demilitarization Facility, Ammunition Maintenance Facility, Depot Level, Steam Cleaning Facility, Depot Level, Rocket And Missile Maintenance Building, Ship Repair Shop, Component Cleaning Facility, Missile Maintenance Building, Area Maintenance Support Activity/Equipment Concentration Site, Weapon Quality Assurance/Calibration

Facility, Depot Level, Munitions Maintenance And Renovation Building, Munitions Calibration Building, Electronics Maintenance Shop, Depot Level, Railroad Equipment/Engine Maintenance Shop, Engineer Maintenance Facility, Aircraft Production Structure, Combat Vehicle Assembly Plant, Small Arms Plant, Heavy Gun Plant, Propellant Charge/Cartridge Filling Building, Explosive Manufacturing Building, Chemical, Biological, Radiological Plant, Inert Renovation And Maintenance Building, Munition Production Buildings, Ammunition Plants, Metal Parts Production, Ammunition Quality Assurance / Calibration Facility, Production, Special Weapons Plant, Leather/Textile/Clothing Plant, Ice Plant, Quarry/Rock Crusher Plant.

**Category 3 - Research, Development, Test, and Evaluation:** This category includes research laboratories for various scientific disciplines (chemistry, physics, metallurgy, human engineering, medical research), specialized buildings for different types of equipment and materials (aircraft, missiles, ordnance, chemicals, communication equipment), and testing facilities like climatic chambers and vibration test labs

- **Predominant Current Use Catcodes:** includes but not limited to 31010, 31015, 31020, 31030, 31040, 31050, 31060, 31065, 31066, 31071, 31110, 31210, 31220, 31410, 31510, 31610, 31620, 31710, 31720, 31730, 31740, 31810, 31820, 31910, 31920, 31930, 32110, 37110, 37120, 39014, 39018, 39024, 39028, 39030, 39034, 39038, 39040, 39064, 39068, 39069, 39075, 39076, 39080
- **Examples:** includes but not limited to Chemistry Lab; Greenhouse, R&D; Metallurgy Lab; Nuclear Physics And Chemical Lab; Physics Lab; Human Engineering Lab; Medical Research Lab; Climatic Chamber Building; Biosafety Level 3 Laboratory; Engineer R&D Laboratory; Aircraft And Flight Equipment Building; Astronautical And Geophysical Building; Guided Missile Building; Ground Transport Equipment Building; Ordnance Building; Chemical Equipment And Material Building; Ammunition/Explosives/Toxics Building; Communication Equipment Building; Detection Equipment Building; Electrical Equipment Building; Electronic Equipment Building; Nuclear Propulsion Building; Propulsion Systems Building; Nonmetallic Material Building; Lab And Test Building, General Purpose; Vibration Test Lab; Precision Machine Shop; RDT&E Range Buildings; RDT&E Range Structures.

**Category 4- Supply (General and Ammunition/Explosives):** This category includes all storage-related facilities, primarily for ammunition, explosives, and hazardous materials, categorized by operational level (Depot, Installation, Unit). It includes specialized magazines for different ammunition types, buildings for hazardous and radioactive materials, general-purpose storage, vehicle storage, and facilities with controlled environments.

- **Predominant Current Use Catcodes:** includes but not limited to 1121, 41123, 41130, 41131, 41140, 41141, 41150, 41180, 4210, 42104, 42107, 42110, 42120, 42150, 42170, 42180, 42181, 42182, 42183, 42184, 42186, 42210, 42215, 42225, 42230, 42231, 42235, 42240, 42250, 42260, 42280, 42281, 42283, 42285, 42286, 42288, 42310, 42311, 42410, 42510, 43211, 44110, 44130, 44135, 44150, 44160, 44180, 44181, 44182, 44210, 44215,

44216, 44217, 44220, 44222, 44223, 44224, 44226, 44227, 44228, 44230, 44240, 44250, 44260, 44262, 44263, 44271, 44288, 45110, 45210

- **Examples:** includes but not limited to Ammunition Storage Pad; Open Storage Area, Depot Level; Open Storage Area, Installation; Explosive Transfer Building, Depot Level; Earth Covered Magazine (ECM); Fuse And Detonator Magazine, Depot Level; High Explosive Magazine, Depot Level; Smokeless Powder Magazine, Depot Level; Guided Missile Magazine, Depot Level; Igloo Storage, Depot Level; Above Ground Magazine; Small Arms Ammunition Magazine, Depot Level; General Purpose Magazine, Depot Level; Service Magazine; Ammunition Storage Building, Depot Level; Fuse And Detonator Magazine, Installation; High Explosive Magazine, Installation; Smokedrum Storehouse, Installation; Small Arms Ammunition And Pyrotechnics Magazine, Installation; Ammunition Storehouse, Installation; Ready Magazine, Installation; Fixed Ammunition Magazine, Installation; Special Weapons Magazine, Installation; Guided Missile Magazine, Installation; Igloo Storage, Installation; Ammunition Hut; Ready Munition Storage; Unit Small Arms Ammunition Storage, Installation; Ammunition Storage Other Than Depot Or Unit; Battery Cold Storage Building; Cold Storage Building, Installation; Storage Building, General Purpose, Depot Level; Controlled Humidity Warehouse, Depot Level; Hazardous Material Storage, Depot Level; Flammable Material Storehouse, Depot Level; Radioactive Storage Warehouse, Depot Level; Vehicle Storage Building, Depot Level; Aircraft Production Parts Storage, Installation; Storage Silo; Storage Building, General Purpose, Installation; Storage Shed, General Purpose, Installation; Arms Building For Battalion And Above; Organizational Storage Building; Covered Storage Building, Installation; Central Issue Facility; Hazardous Material Storage Building, Installation; Controlled Humidity Warehouse, Installation; Flammable Material Storehouse, Installation; Underground Storage Facility, Installation; Radioactive Storage Warehouse, Installation; Vehicle Storage Shed, Installation; Vehicle Storage Building, Installation; Consolidated Housing Furniture Storage; Installation Storage Other Than Depot Or Organizational Jet Fuel Storage, Above Ground, Bulk; Jet Fuel Storage, Underground, Bulk; Diesel Oil/Jp8 Storage, Above Ground, Bulk; Diesel Oil/Jp8 Storage, Underground, Bulk; Gasoline Storage, Above Ground, Bulk; Gasoline Storage, Underground, Bulk; Liquified Gas Storage, Above Ground, Bulk; Fuel Oil Storage, Above Ground, Bulk; Liquid Storage Nonpropellant; Ammunition Storage Structure, Installation; Liquid Propellant Storage, Ammunition, Building; Liquid Propellant Storage, Ammunition, Tank; Open Warehouse, Depot Level; Vehicle Storage Facility, Depot Level; Oxygen Storage Facility, Installation; Acetylene Storage Facility.

**Category 5 - Hospital & Medical:** This category includes facilities related to healthcare and medical services. It includes hospitals, clinics (dental, health, troop medical), laboratories, pharmacies, and veterinary facilities. Additionally, it covers support buildings like medical warehouses and ambulance garages, as well as administrative offices for medical commands.

- **Predominant Current Use Catcodes:** includes, but not limited to 51010, 51016, 53020, 53025, 53040, 53045, 53060, 53071, 54010, 55010, 55011, 55012, 55020
- **Examples:** includes but not limited to Medical Center/Hospital; Medical Command Administration; Laboratory; Pharmacy; Veterinary Facility; Animal Shelter; Medical Warehouse; Ambulance Garage; Dental Clinic; Health Clinic; Army Health Clinic; Army Troop Medical Clinic.

**Category 6 – Administrative:** This category includes administrative offices.

- **Predominant Current Use Catcodes:** includes but not limited to 61001, 61002, 61050, 61055, 61065, 61070, 61075, 62010, 69010, 69020, 69030
- **Examples:** includes, but not limited to Administration Building, General Purpose; Flagpole; Information Stand; Facility Information Sign; Military Entrance Processing Station (MEPS); Recruiting Station; Storefront; Administration Building, General Purpose; Waiting Area/In-Out Processing; Technical Library; Red Cross Building; Courtroom.

**Category 7 - Unaccompanied Personnel Housing and Support:** This category encompasses facility types found on military installations covering essential services, housing, training, and support. It includes unaccompanied personnel housing (barracks), dining facilities, educational and religious buildings, cemeteries, law enforcement and confinement facilities, commissary, exchange, laundry, and physical fitness facilities.

- **Predominant Current Use Catcodes:** includes but not limited to 71310, 75011, 71450, 72010, 72111, 72114, 72115, 72121, 72122, 72170, 72181, 72210, 72212, 72310, 72350, 72360, 72410, 72412, 72510, 73010, 73011, 73012, 73013, 73015, 73016, 73017, 73018, 73019, 73028, 73030, 73032, 73046, 73050, 73070, 73072, 73073, 73074, 73075, 73080, 74003, 74006, 74009, 74010, 74011, 74012, 74013, 74016, 74017, 74019, 74020, 74021, 74022, 74023, 74024, 74025, 74028, 74029, 74030, 74031, 74033, 74034, 74035, 74036, 74040, 74041, 74046, 74047, 74048, 74049, 74050, 74051, 74052, 74053, 74054, 74055, 74056, 74058, 74060, 74062, 74065, 74066, 74068, 74069, 74070, 74072, 74075, 74076, 74078, 74079, 74080, 74082, 74085, 74087, 74089, 75070, 76010, 76011, 76012, 76013, 72520, 73056, 74059, 75017, 75018, 75020, 75021, 75022, 75024, 75025, 75027, 75029, 75030, 75036, 75040, 75041, 75042, 75044, 75050, 75052, 75060, 75061, 75062, 75065, 75080, 75084, 75085, 75086, 75087, 76020, 76030, 76033
- **Examples:** includes but not limited to Storage Building; Trailer Park Service Building; Army Lodging; Permanent Party (Pp) Unaccompanied Housing (Uh), Junior Enlisted & Junior NCO; Collective Training (Ct) Unaccompanied Housing (Uh), Open-Bay; Collective Training (Ct) Unaccompanied Housing (Uh), Mobilization; Institutional Initial Military Training (IIMT) Unaccompanied Housing (Uh), Non-Open-Bay; Institutional Post-Initial Military Training (IPIMT) Unaccompanied Housing (Uh); Permanent Party (Pp) Unaccompanied Housing (Uh), Senior NCO; Dining Facility; Dining Facility: Collective Training; Uh Laundry Building, Detached; Uh Miscellaneous Building;



Permanent Party (Pp) Unaccompanied Housing (Uh), Officer; Collective Training (Ct) Unaccompanied Housing (Uh), Senior NCO And Officer; Collective Training (Ct) Hutment; Physical Fitness Center; Greenhouse; Golf Clubhouse; Golf Course Maintenance Building; Army Community Services Center; Community Activities Center; Conservation Building; Cemeteries; Recreational Lodging; Library Branch; Library Main; Consolidated Open Dining Facility; Enlisted Open Dining Facility; Officer Open Dining Facility; Riding Stable; Exchange Branch; Exchange Cafeteria; Exchange Automotive Service Station; Exchange Main Retail Store; Exchange Maintenance Shop; Exchange Warehouse; Exchange Service Outlet.

**Category 8 - Utility and Ground Improvements:** This category includes utility and environmental facilities crucial for infrastructure support. It includes buildings and structures for power generation and distribution, heating and cooling, water supply and treatment (both potable and non-potable), and sewage and waste management. The facilities cover a range of essential services, ensuring the proper functioning of installations.

- **Predominant Current Use Catcodes:** includes but not limited to 81115, 81117, 81121, 81150, 81160, 81230, 81241, 81242, 81320, 81350, 81360, 82117, 82120, 82130, 82150, 82210, 82220, 82221, 82240, 82310, 82410, 82610, 82625, 82710, 83110, 83112, 83113, 83120, 83130, 83140, 83150, 83180, 83181, 83210, 83220, 83240, 83310, 83312, 83320, 83410, 83420, 84110, 84125, 84130, 84141, 84150, 84210, 84215, 84330, 84450, 84470, 84472, 84510, 84610, 84620, 84710, 84720, 84730, 84740, 85110, 85120, 85130, 85150, 85210, 85211, 85212, 85215, 85216, 85220, 85221, 85225, 85230, 85710, 85715, 85720, 85725, 85730, 86010, 86110, 86120, 86130, 86140, 87110, 87120, 87130, 87140, 87150, 87151, 87171, 87210, 87224, 87230, 87250, 88010, 88111, 88120, 88221, 89111, 89113, 89115, 89120, 89121, 89123, 89126, 89127, 89131, 89133, 89141, 89144, 89148, 89150, 89210, 89215, 89220, 89225, 89230, 89240, 89250, 89260, 89270, 89280, 89310, 89320, 89330, 89340, 89410, 89510, 89520, 89530, 89550, 89560, 89570
- **Examples:** includes but not limited to Electric Power, Oil-Fired; Electric Power, Gas-Fired; Electric Power, Nuclear; Uninterruptable Power Supply; Standby Generator; Exterior Lighting; Substation; Electrical Switching Station; Transformers; Heating Plant, Dual-Fuel; Heating Plant, Oil-Fired; Heating Plant, Gas-Fired; Heating Plant, Steam; Gas Generating Plant; Air-Conditioning/Refrigeration Plant; Heat Pump; Primary Waste Water Treatment; Secondary Waste Water Treatment; Advanced Waste Water Treatment; Septic Tank And Drain Field; Raw Sewage Lagoon And Oxidation Pond; Industrial Waste Water Treatment Plant; Sewage Lift Station; Gravity Oil And Grease Separator; Water And Grit Separator; Incinerator Facility; Refuse Collection Facility; Recycling Facility; Sanitary Landfill; Hazardous Waste Landfill; Water Treatment Plant; Filter Plant Facility; Water Well, Potable; Pump Station, Potable; Chlorinator Facility; Chlorinator Facility, Nonpotable; Water Source, Nonpotable; Pump Station, Nonpotable; Water Storage Tank, Potable; Reservoir, Potable; Water Storage Tank, Nonpotable; Reservoir, Nonpotable; Fire Protection Pond; Water Retaining Basin; Cantonment Area Roads, Paved; Vehicle Bridge; Organizational Vehicle Parking, Paved; Organization Vehicle Parking, Unpaved;

Nonorganizational Vehicle Parking, Paved; Nonorganizational Vehicle Parking, Unpaved; Sidewalks, Stairs, And Walkways, Paved; Sidewalks And Walkways, Unpaved; Pad; Pedestrian Bridges; Training Area Bridge; Railroad Tracks; Railroad Bridge; Railroad Scales; Coal Trestle; Drainage Ditch; Dikes; Retaining Structure; Storm Water Retention/Detention Ponds; Fencing And Walls; Mechanical Security Barricade; Gate; Dam; Special Fire Extinguishing System; Power Plant Building; Compressed Air Plant; Sewage /Waste Treatment Building; Water Supply/Treatment Building, Potable; Monitoring Wells; Environmental Test Facility; Energy Management Control System (EMCS); Gas Storage Tanks; Traffic Signals; Fire Hydrants; Railroad Crossing Signals; Decorative Fountain/Pond; Lightning Protection System, Standalone; Utilidors; Cooling Towers; Imhoff Tank; Pollutant Catch Basin; Sewage Holding Tank; Waste Pol Storage Tank; Hazardous Waste Holding Tank; Fuel Product Recovery Tank; Power Substation/Switching Station Building; Environmental Test Laboratory; Plant/Utilities Building; Heating Plant Building; Refrigeration/Air-Conditioning Building; Combined Air-Conditioning/Heat Plant Building; Refuse And Garbage Building; Water Supply Building, Nonpotable; Water Storage Building; Shredder Facility; Cooling Towers Overhead Electric Lines; Underground Electric Lines; Steam Condensate Lines; Hot Water Lines; Hot/Chilled Water Lines; Steam Lines; Gas Pipelines; Chilled Water Distribution System; Sanitary Sewer; Combined Sewer; Industrial Waste Sewer; Water Distribution Lines, Potable; Supply Main, Potable; Fire Protection System, Non-Potable; Water Distribution Lines, Nonpotable; Cantonment Area Roads, Unpaved; Cantonment Area Tank Trails; Staging/Marshaling Area; Training Area Roads, Paved; Training Area Roads, Unpaved; Training Area Tank Trails, Paved; Training Area Tank Trails, Unpaved; Crane Tracks; Storm Sewer; Irrigation Facility; Pollutant Drainage System; Security Fence; Fire Alarm System; Flood Control Levee/Floodwall; Inert Gas Line; Compressed Air Line; Vacuum Line.

## **Appendix C. Design Guidelines for Pre-1941 Built Infrastructure**

The *Secretary's Standards* at 36 CFR 68 provide guidance for the treatment of historic properties and address four treatment options: preservation, rehabilitation, restoration, and reconstruction. For all pre-1941 historic buildings and structures, the Army will implement the *Secretary's Standards for Rehabilitation* at 36 CFR 68.3(b) through the application of these guidelines. 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 68.3, application of the *Secretary's Standards for Rehabilitation* and these guidelines are contingent on economic and technical feasibility.

### **Purpose**

The purpose of these *Design Guidelines* is to help maintain the historic and architectural character of associated buildings and structures, and landscape features.

### **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. Historic architectural styles used by the Army include Federal, Gothic Revival, Greek Revival, Italianate, Romanesque, Queen Anne, Craftsman, Colonial Revival, Spanish Colonial Revival, among others. It is important to understand that any given example of pre-1941 Army buildings will 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.

### **Historic Architectural Styles and Character Defining Features:<sup>23</sup>**

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

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<sup>23</sup> Reference: A Field Guide to American Houses, by Virginia Savage McAlester, Alfred A. Knopf, 2017.

supported by square or round columns, central door with transom and sidelights, elaborate door surround or enframing, 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): 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.

Neoclassical (1890-1950): Façade dominated by full height porch with roof supported by classical columns. Columns usually with Ionic or Corinthian capitals, symmetrical balanced windows and center door.

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.

International Style (1930s-1970s): Characterized by minimalist design, flat roofs, steel and glass construction, and a lack of ornamentation. Often seen in office buildings and institutional structures.

**Design Guidelines General:** Implementation of these guidelines is subject to the technical and financial feasibility of the recommendations. These design guidelines are limited in application to the exterior front facades only of pre-1941 buildings and structures. These guidelines do not apply to side or rear building elevations; there are no special building materials or preservation measures required for side or rear building elevations. These guidelines do not apply to buildings, structures, and landscapes constructed in 1941 and later. These guidelines do not apply to pre-1941 buildings, structures, and landscapes that are not eligible for listing in the National Register of Historic Places. Additional guidance is contained in the *Secretary of the Interior's Guidelines for Rehabilitating Historic Buildings*.

### **Guidelines for Rehabilitation, Additions, Exterior Alterations, and Adjacent or Related Construction, and New and Replacement Construction**

- a. The appearance and character defining exterior front façade features of pre-1941 buildings and structures will be maintained to the maximum extent possible during these activities.
- b. Exterior additions will be compatible with the mass, form, character-defining features, and general architectural style of the building. Ensure the size and scale of new additions in relationship to the building do not diminish, obscure or overwhelm the character of the historic building.
- c. Additions should be placed in the rear and on secondary elevations to maintain the front façade and will be compatible with the scale, character-defining features, and architectural style of the associated buildings.
- d. Where removal of exterior front façade 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.
- e. Restoration of historic features that have previously been removed is not required.
- f. New additions, exterior alterations, and adjacent or related construction should not destroy front façade features that characterize the property to the extent possible.
- g. 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 would be unimpaired.
- h. New and replacement building construction will be compatible with the mass, form, character-defining features and general architectural style of the existing buildings and structures.
- i. New compatible construction that occurs as infill within the existing pattern of development serves to preserve the historic character of the associated buildings and structures.
- j. New and replacement building construction may accommodate additional square footage (i.e., square footage beyond that of the surrounding historic buildings) in the rear and on side elevations of the building. New and replacement construction will maintain

compatibility of the front façade with the scale of surrounding historic buildings and structures.

### **Guidelines for Windows and Doors (Front facade only)**

- 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 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.
- 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.

### **Guidelines for Entrances, Porches and Details (Front facade only)**

- a. Maintain historic front façade 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 front façade 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.

- 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.
- 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. 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. If a historic roof has already been replaced with modern materials, modern material shall continue to be used in future replacements.
- 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 or historic roofing materials 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 building 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 asphalt

shingles, it is permissible to re-roof with asphalt shingles, i.e., with the modern building materials.

### **Guidelines for Foundations and Walls (Front facade only)**

- a. Maintain historic foundations and exterior front facade 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 front facade 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 facade 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 front facade exterior walls. Imitative substitute materials will simulate the dimensions and finish of the historical building materials.

### **Guidelines for Historic Designed Landscapes and Features (Applicable only to designed landscapes in cantonment area historic districts)**

- 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 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. Recreation of designed landscape features is not required.
- c. Installation of new fencing where none currently exists is allowed. 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 if financially and technically feasible.
- d. 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 trees and other plant materials may occur where necessary.

- e. 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.
- f. Replacement of a documented historic landscape feature that is not currently existing is not required.

### **Guidelines for Historic Districts**

- a. Maintain character defining views and view sheds into and out of historic buildings and historic districts including scenic vistas and open space to the 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 extent possible.
- c. Solar panel and freestanding solar arrays and other energy related features and elements are acceptable within historic districts.

### **Guidelines for Circulation Systems and Paving Patterns**

- a. Maintain character defining 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 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 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 Force Protection**

- a. Comply with force protection standards in a manner that maintains character-defining exterior building features on the front facade to the 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 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. To the extent possible, locate ventilation equipment or other force protection utilities on inconspicuous elevations, such as on the side or rear facade, to limit the visibility 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. All interior alternations proceed as required by mission needs without restriction.

### **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.
- 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 emergency repairs to pre-1941 buildings. The repairs should be done in a manner that will cause minimal harm to the front facade of the historic building if 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, replacement of plaster with drywall is acceptable.

### **Guidelines for Mothballing Buildings**

- a. Ensure that roofs are weather tight by replacing missing shingles or tiles and repair openings in an acceptable 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 D. Building Materials Guidelines and Catalog for Pre-1941 Built Infrastructure**

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

The building materials selection procedure, the *Design Guidelines*, along with the *Building Materials Guidelines and Catalog* establishes a standard procedure, guidance, and catalog for the selection of appropriate building materials for implementation of management actions on the exterior front façades of pre-1941 buildings and structures.

*Building Materials Guidelines and Catalog* entries are provided for major components of the building 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 front facade 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* 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 - Army 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 design of the area. Consider the location of necessary mechanical systems adjacent to secondary or rear elevations.

**Type:** Retain or simulate 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 building 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.

<b>Manufactured Stone Veneer</b>	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.
<b>Veneer</b>	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.
<b>Acrylic Stucco</b>	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.
<b>Masonry Block/Precast Stone</b>	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.
<b>Precast Concrete Slab</b>	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 front facade wall claddings, when appropriate. In cases where replacement of front facade 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 front facade 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 were used in historic Army buildings the as a primary wall material 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 building design and the visibility of the proposed work may be considerations in wood cladding replacement.

**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 front façade wall appearance.

**Size:** The dimensions of the cladding type also are factors in the appearance of the exterior front façade wall. Replacement cladding should approximate the overall height, width, and depth of the existing or historic fabric as closely as possible.

**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 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 front facade 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 front facade 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.

<b>Cellular Composite</b>	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.
<b>Engineered Wood</b>	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.
<b>Fiber Cement / Cementitious</b>	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.
<b>Metal</b>	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.
<b>Vinyl</b>	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.
<b>Wood Composite</b>	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.
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## 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 front facade 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 front facade 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. Early 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 typically limited to buildings 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 building and to the area, 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 front façade 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 building 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 front facade 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 front facade 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.

<b>Manufactured Stone Veneer</b>	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.
<b>Veneer</b>	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.
<b>Precast Stone, Stabilized adobe brick, Compressed adobe brick</b>	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.
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## 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 front facade 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 front facade 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 front facade and the associated historic district.

**Location:** Stucco exterior finishes often are character-defining design features. Consider maintaining front facade 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.

**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 front facade 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-1941 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 front facade 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.

<b>Acrylic Stucco</b>	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 than traditional, concrete-based stuccos.
<b>Exterior Insulation and Finish Systems</b>	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.
<b>Elastomeric Paint</b>	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.

<b>Fiber Cement Board</b>	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.
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## 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 buildings 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 19<sup>th</sup> century, sheet iron coated with zinc, tin, or lead to prevent rust came into use. Later in the 19<sup>th</sup> 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 building 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 building 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.

<b>Tile</b>	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.
<b>Engineered Wood</b>	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.

<b>Fiber Cement</b>	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.
<b>Asphalt Composition</b>	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.
<b>Plastic and Rubber Composites, Membrane</b>	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.
<b>Resin</b>	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.
<b>Metal</b>	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 (Front facade only)**

The *Design Guidelines* support the repair and maintenance of historic materials used in front facade porches, when appropriate. In cases where replacement of front facade 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 front facade 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 historic building component. 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 front façade design and the visibility of the proposed replacement material. Consider limiting replacement to deteriorated areas of the porch, when possible.

**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 front façade porch design and the dimensions of historic elements, where possible, often are most successful in maintaining the historical and architectural character of the individual building 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 front facade 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.

<b>Vinyl</b>	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 vary in quality and durability. Vinyl can have a shiny "plastic" appearance that may not be appropriate in certain circumstances.
<b>Manufactured Stone</b>	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.

<b>Veneer</b>	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.
<b>Fiber Cement Board</b>	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.
<b>Fiberglass</b>	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.
<b>Aluminum</b>	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.
<b>Molded Plastic</b>	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.
<b>Resin</b>	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 (Front facade only)**

The *Design Guidelines* support the repair and maintenance of historic materials used in window bays, when appropriate. In cases where replacement of front facade 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 front facade 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 pre-1941 buildings. Window replacement is a common modification to the Army 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:

**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 building plans. Consider retaining historic front facade 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. Front facade 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 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 building 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 front facade 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 front facade 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.

<b>Vinyl</b>	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.
<b>Fiberglass</b>	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.
<b>Aluminum</b>	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.
<b>Resin</b>	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 (Front facade only)**

The *Design Guidelines* support the repair and maintenance of front facade historic entries. In cases where replacement of front facade 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-1941 buildings. 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:** Front facade entrances are a major character-defining feature in the design of historic buildings. Original front facade entry bays and associated architectural elements should be maintained when possible.

**Type:** Doors are classified by whether 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 front facade 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. Front façade 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 building 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*. 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 front facade 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.

<b>Vinyl</b>	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.
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<b>Fiberglass</b>	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.
<b>Metal</b>	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.
<b>Resin</b>	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 in Cantonment Areas (not applicable outside of Army cantonment areas)**

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 in cantonment areas during the pre-1941 period. Built features, such as lighting, fencing, hardscape and street furniture, may reflect the dominant architectural styles of the installation. Site designs were influenced by contemporary designs of the historic 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 landscapes, circulation patterns, setbacks, plant materials, and communal landscapes contribute to the qualities of the area. 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 area. Consider replacement elements that simulate historic designs and placement, where possible. Consider replacement plant materials from any approved installation list that are the same species as the original, if native and non-invasive, 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, and regional design standards.

**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 cantonment area 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*. 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.

<b>Vinyl</b>	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.
<b>Fiberglass</b>	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.
<b>Engineered Wood</b>	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.
<b>Aluminum</b>	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.
<b>Manufactured Stone</b>	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.
<b>Veneer</b>	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.
<b>Xeriscape</b>	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 elements.
<b>Resin</b>	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.

## **Appendix E. Army PAs, MOAs, and AAPs**

### **Active Army**

1. U.S. Army Garrison, Picatinny Arsenal, New Jersey, Army Alternate Procedures, Historic Properties Component Plan of the Integrated Cultural Resources Management Plan 2025-2029  
Last Signature: 3/12/2025  
Expiration: 12/31/2029
2. Programmatic Agreement Among the United States Army Garrison, Yuma Proving Ground, the Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Operations, Maintenance, and Development of Yuma Proving Ground  
Last Signature: 11/1/2024  
Expiration: 11/16/2026
3. Memorandum of Agreement Between the United States Army Anniston Army Depot and the Alabama State Historic Preservation Office for the Continued Operation of the Ammunition Limited Area 2016  
Last Signature: 9/26/2016  
Expiration: 9/26/2026
4. Memorandum of Agreement Between the United States Army Anniston Army Depot and the Alabama State Historic Preservation Office for the Continued Operation of the Lance Missile Fueling Facility 2016  
Last Signature: 9/26/2016  
Expiration: 9/26/2026
5. Memorandum of Agreement Between the United States Army Anniston Army Depot and the Alabama State Historic Preservation Office for the Continued Operation of the Nichols Industrial Complex  
Last Signature: 9/10/2019  
Expiration: 9/10/2025
6. Memorandum of Agreement Between the U.S. Army Garrison Alaska and the Alaska State Historic Preservation Officer Regarding Archaeological Excavation and Mitigation of the Niidhaayh Na' Site, Donnelly Training Area, Fort Wainwright, Alaska  
Last Signature: 7/15/2021  
Expiration: 7/15/2026
7. Memorandum of Agreement between the U.S. Army Garrison Fort Wainwright and the Alaska State Historic Preservation Officer regarding Archaeological Excavation and Mitigation of the McDonald Creek Site (Shég' Xdaltth'i' FAI-02043), Tanana Flats Training Area, Fort Wainwright, Alaska  
Last Signature: 5/26/2021

Expiration: 5/26/2028

8. Programmatic Agreement Between the United States Department of the Army and the Alaska State Historic Preservation Officer Regarding the Operation, Maintenance, and Development of the Army Installation at Fort Wainwright and Associated Training Areas  
Last Signature: 12/29/2021  
Expiration: 12/29/2030
9. Programmatic Agreement for Section 106 Responsibilities for the Aboriginal Hawaiian Use of Ukanipo Heiau Complex at Mākua Military Reservation  
Last Signature: 10/12/2000  
Expiration: None.
10. Programmatic Agreement Among the United States Army, Hawai‘i State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the Privatization of Family Housing at US Army Garrison, Hawai‘i  
Last Signature: 8/31/2004  
Expiration: 8/30/2054
11. Programmatic Agreement Among the U.S. Army Garrison, Hawaii, the Hawai‘i State Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related activities At United States Army Training Ranges on the Island of O‘ahu, Hawai‘i  
Last Signature: 8/24/2018  
Expiration: 8/23/2033
12. Programmatic Agreement Among the U.S. Army Garrison, Pōhakuloa, the Hawai‘i State Preservation Officer, and the Advisory Council on Historic Preservation Regarding Routine Military Training Actions and Related activities At United States Army Training Ranges on the Island of Hawai‘i, Hawai‘i  
Last Signature: 8/24/2018  
Expiration: 8/23/2033
13. Programmatic Agreement Regarding Transfer and Rehabilitation of the Lodging Facilities at Tripler Army Medical Center  
Last Signature: 5/1/2009  
Expiration: 4/30/2059
14. Memorandum of Agreement Between the US Army Garrison, Hawaii, the Hawai‘i State Historic Preservation Officer Regarding the High Mast Lighting Project and the Intersection Repair Project at Kālia Road and Maluhia Road within Fort DeRussy Military Reservation, O‘ahu, Hawai‘i  
Last Signature: 6/19/2020  
Expiration: 6/19/2030



15. Memorandum of Agreement Between the US Army Garrison, Hawaii, the Hawai‘i State Historic Preservation Officer, the Advisory Council on Historic Preservation, and Island Palm communities for the Resolution of Adverse Effects Resulting from the Renovations of Quarters 12, Palm Circle, Fort Shafter Military Reservation, O‘ahu, Hawai‘i  
Last Signature: 5/11/2023  
Expiration: 5/10/2028
16. First Amendment to the Memorandum of Agreement Between the US Army Garrison, Hawaii, the Hawai‘i State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Vegetation Management in Various Archaeological Sites in Makua Military Reservation, O‘ahu, Hawai‘i  
Last Signature: 9/10/2025  
Expiration: 9/10/2028
17. Memorandum of Agreement Between the United States Army Garrison Hawaii and the Hawaii State Historic Preservation Officer for the Resolution of Adverse Effects Resulting from the Rehabilitation of Building 500, Fort Shafter Military Reservation O‘ahu, Hawai‘i  
Last Signature: 8/22/2025  
Expiration: 8/22/2032
18. Memorandum of Agreement Between U.S. Army Garrison, Fort Gordon and the Georgia State Historic Preservation Officer Regarding the Construction, Demolition, and Renovation of Buildings Within the Signal School Historic District, Fort Gordon, Richmond, Columbia, McDuffie, and Jefferson Counties, Georgia  
Last Signature: 11/1/2021  
Expiration: 11/1/2031
19. Programmatic Agreement Among U.S. Army Garrison Fort Gordon, the Georgia State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Operations, Maintenance, Training, and Development of Fort Gordon, Richmond, Columbia, McDuffie, and Jefferson Counties, Georgia  
Last Signature: 5/12/2025  
Expiration: 7/31/2027
20. FY 2025 through FY 2029 Army Alternate Procedures Historic Properties Component of the Integrated Cultural Resources Management Plan, U.S. Army Garrison Fort Moore (Benning), Georgia/Alabama  
Last Signature: 1/24/2025  
Expiration: 1/23/2030
21. Programmatic Agreement Among U.S. Army Garrison Fort Sill, Oklahoma, Oklahoma State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the Privatization of Family Housing at Fort Sill, Oklahoma  
Last Signature: 7/17/2024  
Expiration: 4/3/2058

22. Programmatic Agreement Among U.S. Army Garrison Fort Sill, Oklahoma and the Oklahoma State Historic Preservation Officer for the Privatization of Army Lodging at Fort Sill, Oklahoma  
Last Signature: 6/24/2008  
Expiration: 6/24/2058
23. Prototype Programmatic Agreement Between the United States Army Fort Sill and the Oklahoma State Historic Preservation Office Regarding Building Interiors  
Last Signature: 2/7/2022  
Expiration: 2/8/2032
24. Memorandum of Agreement Among U.S. Army Garrison Fort Sill, the Oklahoma State Historic Preservation Officer and the Advisory Council on Historic Preservation Regarding Improvements to the Indian Agency Cemetery, 4900 Area, Fort Sill, Oklahoma.  
Last Signature: 6/11/2012  
Expiration: None.
25. Memorandum of Agreement Between U.S. Army garrison Fort Sill and the Oklahoma State Historic Preservation Officer Regarding the Demolition and/or Renovation of Pre-WWII Ammunition & Explosives Magazines in the 2300 Area, Fort Sill, Oklahoma.  
Last Signature: 8/12/2019  
Expiration: None.
26. Programmatic Agreement between US Army Garrison Fort Belvoir and the Virginia State Historic Preservation Officer for the Privatization of Family Housing at Fort Belvoir, Virginia  
Last Signature: 8/18/2003  
Expiration: 8/18/2053
27. Programmatic Agreement Among U.S. Army Garrison Fort Belvoir, Virginia, The Virginia State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the Privatization of Army Housing and Discontinuation of Lodging At Buildings 172 and 20 Fort Belvoir Virginia  
Last Signature: 8/29/2011  
Expiration: 8/29/2061
28. First Amendment to Programmatic Agreement among U.S. Army Garrison Fort Belvoir, Virginia, the Virginia State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the Privatization of Army Housing and Discontinuation of Lodging at Buildings 172 and 20 Fort Belvoir Virginia  
Last Signature: 8/24/2012  
Expiration: 8/29/2061

29. Memorandum of Agreement Among US Army Garrison Fort Belvoir, Virginia; The Virginia State Historic Preservation Officer; The Advisory Council on Historic Preservation; and Fort Belvoir Residential Communities LLC to Mitigate Adverse Effects of the Replacement of Windows in Historic Family Housing, Fort Belvoir, Virginia  
Last Signature: 6/9/2014  
Expiration: 6/9/2029
30. Memorandum of Agreement Among U.S. Army Garrison Fort Belvoir, Virginia; The Virginia State Historic Preservation Officer; the Advisory Council on Historic Preservation; and Fort Belvoir Residential Communities LLC to Mitigate Adverse Effects to the Dogue Run Farm Earthen Berm Fence for the Construction of Family Housing at Fort Belvoir  
Last Signature: 11/22/2017  
Expiration: 11/22/2027
31. Memorandum of Agreement Between U.S. Army Garrison Fort Belvoir, Virginia and the Virginia State Historic Preservation Officer for the Replacement of the Dogue Creek Bridge Superstructure, Fort Belvoir, Virginia  
Last Signature: 3/19/2018  
Expiration: 3/19/2028
32. Fourth Amendment to the Programmatic Agreement Among U.S. Army Garrison Fort Carson, and the Advisory Council on Historic Preservation Regarding Construction, Maintenance, and Operations Activities for Areas on Fort Carson, Colorado.  
Last Signature: 12/7/2022  
Expiration: 12/31/2025
33. First Amendment to the Programmatic Agreement among U.S. Army Garrison Fort Carson, Colorado State historic Preservation Officer and the Advisory Council on Historic Preservation Regarding Military Training and Operational Support Activities Down Range Fort Carson, Colorado  
Last Signature: 3/19/2018  
Expiration: 3/19/2028
34. First Amendment to the Programmatic Agreement among U.S. Army Garrison Fort Carson, Colorado State Historic Preservation Officer and the Advisory Council on Historic Preservation Regarding Military Training and Operational Support Activities at Pinon Canyon Maneuver Site, Fort Carson, Colorado  
Last Signature: 3/19/2018  
Expiration: 3/9/2022
35. Programmatic Agreement Among the United States Army Garrison Fort Riley, the Kansas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Operation, Maintenance, and Development of Fort Riley, Clay, Geary and Riley Counties, Kansas  
Last Signature: 3/8/2017

Expiration: 3/9/2022

36. Programmatic Agreement Among Fort Riley, Kansas, Kansas State Historic Preservation Officer and Advisory Council on Historic Preservation for the Privatization of Army Lodging at Fort Riley, Kansas  
Last Signature: 4/13/2009  
Expiration: 4/13/2059
37. Programmatic Agreement Between the United States Army Fort Riley, the Kansas State Historic Preservation Officer, and Riley Communities, LLC for the Privatization of Family Housing at Fort Riley, Riley and Geary Counties, Kansas  
Last Signature: 11/13/2015  
Expiration: 11/13/2056
38. Memorandum Of Agreement Between the U.S. Army Garrison Fort Knox and the Kentucky State Historic Preservation Officer for The Installation of An Entrance Awning Canopy on Building No. 1467  
Last Signature: 8/18/2018  
Expiration: None.
39. Memorandum Of Agreement Between the U.S. Army Garrison Fort Knox and The Kentucky State Historic Preservation Officer for The Demolition of Eight Historic Buildings  
Last Signature: 4/10/2022  
Expiration: 4/10/2030
40. Memorandum Of Agreement Between the U.S. Army Garrison Fort Knox and the Kentucky State Historic Preservation Officer Regarding the Demolition of Crittenberger School, Fort Knox, Kentucky  
Last Signature: 9/25/2023  
Expiration: 4/10/2029
41. Programmatic Agreement Among the U.S. Army Garrison Fort Knox, The Kentucky State Historic Preservation Officer, And the Advisory Council on Historic Preservation for The Privatization of Army Lodging At Fort Knox, Kentucky  
Last Signature: 2/6/2012  
Expiration: 2/6/2062
42. Memorandum Of Agreement Between the U.S. Army At Aberdeen Proving Ground and The Maryland State Historic Preservation Officer, And the Advisory Council on Historic Preservation - The Demolition of Buildings Within the World War 1 Barracks Historic District, Edgewood Area, Harford County, Maryland  
Last Signature: 12/30/2015  
Expiration: 12/30/2025

43. Programmatic Agreement Among the U.S. Army Aberdeen Providing Ground the Maryland State Historic Preservation Officer - Demolition Of Contaminated Research Laboratories At The Edgewood Area Of Aberdeen Proving Ground, Harford County, Maryland  
Last Signature: 2/12/2021  
Expiration: 2/12/2036
44. Programmatic Agreement Among Aberdeen Proving Ground, Maryland, The Maryland State Historic Preservation Officer, Gate APG LLC and St. Johns Properties Inc, for the Government and Technology Enterprise (The Gate) Enhanced Use Leasing Project at Aberdeen Proving Ground Harford County, Maryland  
Last Signature: Unknown  
Expiration: Unknown
45. Programmatic Agreement Among Aberdeen Proving Ground, Maryland, The Maryland State Historic Preservation Officer, And APG-Picerne Partners LLC for the Privatization of Family Housing at Aberdeen Proving Ground, Maryland  
Last Signature: 1/7/2009  
Expiration: 1/7/2059
46. Programmatic Agreement between the United States Military Academy, West Point, New York and the New York State Historic Preservation Office Regarding Utilities Privatization at the United States Military Academy, West Point, New York  
Last Signature: 12/17/2003  
Expiration: Duration of lease (50 years from 2018 for electric and from 2020 for water)
47. Programmatic Agreement among the United States Army Garrison, West Point, New York, the New York State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Residential Community Initiative Implementation at the United States Army Garrison, West Point, Orange County, New York  
Last Signature: 4/3/2008  
Expiration: 4/3/2058
48. Programmatic Agreement between the United States Army Garrison West Point and the New York State Historic Preservation Officer for the Privatization of Army Lodging  
Last Signature: 5/23/2013  
Expiration: 5/23/2063
49. Programmatic Agreement among the United States Army Garrison West Point, the New York State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Operations, Maintenance, and Development Activities, United States Army Garrison West Point, West Point, New York  
Last Signature: 8/12/2016  
Expiration: 8/12/2026

50. Programmatic Agreement between the United States Army Garrison West Point and the New York State Historic Preservation Officer Regarding the Academic Buildings Upgrade Program (ABUP) and the Patton Modular Complex Development, United States Army Garrison West Point, West Point, New York  
Last Signature: 11/4/2019  
Expiration: 11/4/2044
51. Programmatic Agreement Between Fort Myer, Virginia and the Virginia State Historic Preservation Officer for the Privatization of Army Lodging  
Last Signature: 4/27/2009  
Expiration: Duration of Lease
52. First Amendment to Programmatic Agreement Between Joint Base Myer-Henderson Hall, Fort Myer, Virginia and the Virginia State Historic Preservation Officer for the Privatization of Army Lodging  
Last Signature: 5/10/2011  
Expiration: Duration of Lease
53. Department of the Army Fort Hood, Texas Army Alternate Procedures Historic Properties Component for Certification under the Army Alternate Procedures for Historic Properties June 2021 - June 2026  
Last Signature: 6/24/2021  
Expiration: 6/24/2026
54. Programmatic Agreement Among the USAG Fort Huachuca, AZ SHPO, and ACHP for the Rehabilitation of Building 66050 at Fort Huachuca, Arizona  
Last Signature: 1/6/2024  
Expiration: 1/6/2034
55. Programmatic Agreement Among the US Army Intelligence Center and USAG Fort Huachuca, AZ SHPO, and ACHP for the Privatization of Family Housing at Fort Huachuca, Arizona  
Last Signature: 7/3/2008  
Expiration: 7/3/2058
56. Memorandum of Understanding Between 24th Infantry Division (Mechanized) & Fort Stewart and the Georgia Historic Preservation Division for Southern Pine Beetle Damaged Timber Salvage  
Last Signature: 5/26/1995  
Expiration: None.
57. Programmatic Agreement Among the United States Army Garrison, Fort Bliss and The New Mexico State Historic Preservation Officer and the Texas State Historic Preservation Officer and the Advisory Council on Historic Preservation for the Management, Operation, and Development of Historic Properties on Fort Bliss Under

Section 106 of the National Historic Preservation Act of 1966 (as amended) Fort Bliss,  
Texas and New Mexico  
Last Signature: 9/9/2024  
Expiration: 9/9/2026

58. Memorandum of Agreement Between the United States Army Defense Artillery Center and Fort Bliss and the Texas State Historic Preservation Officer regarding Replacement of Buildings 59 and 60  
Last Signature: 4/24/2024  
Expiration: 4/24/2039
59. Memorandum of Agreement Between the Fort Bliss Garrison Command and the Texas State Historic Preservation Officer Regarding the Lease of Lands that include Historic Properties located on Fort Bliss  
Last Signature: 2/21/2019  
Expiration: 6/1/2044--with option for an additional 25 years
60. Amendment #1 to the Programmatic Agreement among the United States Army Garrison, Fort Bliss, and the New Mexico State Historic Preservation Officer, the Texas State Historic Preservation Office and the Advisory Council on Historic Preservation for the Management, Operation, and Development of Historic Properties on Fort Bliss  
Last Signature: 10/9/2024  
Expiration: 10/9/2026
61. Programmatic Agreement Among the US Army Garrison Fort Leonard Wood, The Missouri State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the Privatization of Army Lodging at Fort Leonard Wood, Missouri  
Last Signature: 9/19/2011  
Expiration: 9/19/2061
62. Memorandum of Agreement Among the US Army Garrison Fort Leonard Wood, the Missouri State Historic Preservation Officer, the Kaw Nation, The Omaha Tribe of Nebraska and Iowa, The Osage Nation, the Ponca Tribe of Nebraska, and the Ponca Tribe of Oklahoma Regarding the Mitigation of Adverse Effects to Archaeological Sites  
Last Signature: 3/30/2021  
Expiration: 3/30/2026
63. Memorandum of Agreement Between the US Army Garrison Fort Leonard Wood and the Missouri State Historic Preservation Officer Regarding the Demolition of the WWII-Era Red Cross Building (Building 430) and Associated Prisoner of War Stonework at Fort Leonard Wood, Missouri  
Last Signature: 9/11/2020  
Expiration: 9/11/2025

64. Programmatic Agreement Among Carlisle Barracks, PA and the Pennsylvania State Historic Preservation Officer for the Privatization of Family Housing at Carlisle Barracks, PA  
Last Signature: 8/31/2004  
Expiration: 8/21/2054 with option to renew for 25 more years
65. Programmatic Agreement Among the Department of the Army National Training Center and Fort Irwin, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Military Activities and Support Operations at Fort Irwin and the Manix Trail, San Bernardino County, California  
Last Signature: 12/15/2022  
Expiration: 12/15/2027
66. Memorandum of Agreement Among the Watervliet Arsenal, the New York State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Gillespie Gate Improvement Project  
Last Signature: 6/14/2022  
Expiration: 6/14/2027
67. Memorandum of Agreement Among the Watervliet Arsenal, the New York State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Divestiture of Army Family Housing, Watervliet, Albany County, New York  
Last Signature: 5/22/2024  
Expiration: 5/22/2034
68. Programmatic Agreement Among the United States Army Garrison – Rock Island Arsenal, the Illinois State Historic Preservation Office, the Advisory Council on Historic Preservation, the National Park Service – Midwest Region, and the residential Communities Initiative Privatized Housing Partner Regarding the Operation, Maintenance, and Development of Leased Army Family Housing at Rock Island Arsenal  
Last Signature: 9/26/2023  
Expiration: 9/26/2073 with option to renew or 25 more years
69. Memorandum of Agreement Between the United States Army, Fort Lee and the Virginia States Historic Preservation Officer Regarding Training and Site 44PG0299, Fort Lee, Prince George County, Virginia  
Last Signature: 1/24/2024  
Expiration: 1/24/2029
70. Memorandum of Agreement between the United States Army, Fort Lee and the Virginia State Historic Preservation Officer regarding the Expansion of Training Activities Affecting Site 44PG0299 at US Army Garrison Fort Lee, Prince George County, Virginia  
Last Signature: 1/20/2023  
Expiration: 1/20/2028



71. Programmatic Agreement Among the United States Army, Fort Lee, the Virginia State Historic Preservation Officer, and Advisory council on Historic Preservation Regarding Operation, Maintenance and Repair Activities at US Army Garrison Fort Lee Prince George County, Virginia  
Last Signature: 9/20/2017  
Expiration: 9/20/27
72. Programmatic Agreement Between the United States Army Garrison Fort Lewis and the Washington Historic Preservation Officer Concerning the Management of Historic Properties on Fort Lewis and the Yakima Training Center Under Section 105 of the National Historic Preservation Act (as amended)  
Last Signature: 8/19/2010  
Expiration: None.
73. Amendment #2 to the Programmatic Agreement Among U.S. Army Garrison Fort Hunter-Liggett, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding Off-road Vehicle Maneuver Military Training at Fort Hunter-Liggett, California.  
Last Signature: 5/31/2022  
Expiration: 6/1/2027
74. Memorandum of Agreement between the United State Army Garrison, Fort Liberty (Bragg) and the North Carolina State Historic Preservation Officer for the Demolition of Building 708 and Building 1-3151, Fort Liberty, Cumberland County, North Carolina  
Last Signature: 3/3/2025  
Expiration: 3/3/2030
75. Programmatic Agreement among Fort Bragg, North Carolina State Historic Preservation Officer, and Advisory Council on Historic Preservation for the Privatization of Family Housing at Fort Bragg, North Carolina  
Last Signature: 3/14/2003  
Expiration: 3/14/2053 with option to renew for 25 years.
76. Memorandum of Agreement Amongst the U.S. Army Garrison – Redstone Arsenal, Alabama, the Defense Intelligence Agency, and the Alabama State Historic Preservation Officer regarding the Expansion of the Missile and Space Intelligence Center, Redstone Arsenal, Alabama  
Last Signature: 12/06/2022  
Expiration: 12/06/2027
77. Programmatic Agreement among the United State Army Anniston Depot, the Alabama State Historic Preservation Office, and the Advisory Council on Historic Preservation regarding Operation and Maintenance at the Anniston Army Depot.  
Last Signature: 8/27/2025  
Expiration: 8/27/2035

78. Programmatic Agreement among Arlington National Cemetery, the Virginia State Historic Preservation Officer, and the Advisory Council on Historic Preservation for the Operation, Maintenance and Repair Activities at Arlington National Cemetery  
Last Signature: 2/6/2025  
Expiration: 2/6/2026
79. Amendment to the Memorandum of Agreement among Arlington National Cemetery, the Virginia State Historic Preservation Officer, and the Air Force District of Washington regarding the Southern Expansion Project, Arlington National Cemetery, Arlington County, VA  
Last Signature: 12/2/2024  
Expiration: 12/2/2034
80. Programmatic Agreement among Arlington National Cemetery, the Virginia State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the Removal of the Confederate Memorial from Arlington National Cemetery, Arlington County, VA  
Last Signature: 12/15/2023  
Expiration: 12/15/2028
81. Programmatic Agreement Among the United States Army, the Advisory Council on Historic Preservation and the California State Historic Preservation Officer Regarding Routine Maintenance of Historic Properties at the Presidio of Monterey, CA.  
Last Signature: 6/16/1993  
Expiration: None
82. Memorandum Of Agreement Among the United States Army Garrison Fort Jackson, The South Carolina State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Demolition of Building 1895, Fort Jackson, South Carolina.
83. Programmatic Agreement among the United States Army Garrison Fort Campbell, the State Historic Preservation Officer of Kentucky, the State Historic Preservation Officer Of Tennessee, and the Advisory Council on Historic Preservation Regarding Operations, Maintenance, Training, and Development at Fort Campbell, Kentucky And Tennessee
84. Memorandum Of Agreement between the U.S. Army Garrison, Presidio of Monterey and the California State Historic Preservation Officer Regarding Construction of a Parking Lot within the Presidio of Monterey Historic District Monterey, California.  
Last Signature: 09/18/2025  
Expiration: 09/18/2030

#### **United States Army Reserve**

85. Programmatic Agreement Among the United States Army Garrison Fort Buchanan, RCI Privatized Housing Partnership, Lendlease Public Partnership Holdings LLC., The Puerto

Rico State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Operation, Maintenance, and Development of Army Family Housing Las Colinas, Guaynabo, Puerto Rico

Last Signature: 7/1/2023

Expiration: 7/18/2033

86. Memorandum of Agreement Between the United States Army Reserve, 88th Readiness Division, and the Illinois State Historic Preservation Officer for the Demolition of Bridge JTR4B at the Joliet Training Area, 20612 Arsenal Road, Elwood, Illinois, 60421

Last Signature: 5/5/2022

Expiration: 5/5/2027

87. Memorandum of Agreement Among the US Army Reserve 63rd Readiness Division, and the California State Historic Preservation Officer, and the Mare Island Heritage Trust Regarding the Demolition of Two Electrical Distribution Centers at the Mare Island US Reserve Center in Vallejo, CA

Last Signature: 4/8/2025

Expiration: 4/8/2030

88. Memorandum of Agreement Between the United States Army Reserve, 88th Readiness Division, and the Missouri State Historic Preservation Officer Regarding the Demolition of the Former Pythian Powerhouse and Laundry Building (503) 1110 North Fremont Ave, Springfield, MO 65802

Last Signature: 1/20/2024

Expiration: 1/20/2029

89. Memorandum of Agreement Between the United States Army Reserve, 81st Readiness Division and the North Carolina State Historic Preservation Officer Regarding the Disposal of the Thomas B. Smothers U.S. Army Reserve Center, 1245 Martin Luther King Jr. Drive, Winston-Salem, North Carolina

Last Signature: 5/25/2022

Expiration: 5/25/2024

### **Army National Guard**

90. Programmatic Agreement Among the Virginia Army National Guard, the National Guard Bureau, Virginia State Historic Preservation Office, and the Advisory Council on Historic Preservation Regarding Routine Operations, Maintenance, Development, and Training Actions at Virginia Army National Guard Properties Throughout Virginia

Last Signature: 9/29/2016

Expiration: 9/29/2026

91. Amendment to Memorandum of Agreement Among the National Guard Bureau, Rhode Island Army National Guard, and the Rhode Island Historical Preservation and Heritage Commission for the Demolition of Camp Varnum Training Site Building T-31 Narragansett, Rhode Island

Last Signature: 11/9/2023  
Expiration: 11/9/2028

92. Memorandum Of Agreement Among the National Guard Bureau, North Carolina Army National Guard, And The North Carolina State Historic Preservation Officer for The Demolition of The East Carolina Industrial Training School Rocky Mount, Edgecombe County, North Carolina 2024  
Last Signature: 10/31/2024  
Expiration: 10/31/2029
93. Memorandum of Agreement Among the Adjutant General's Department and The Texas Historical Commission for the Building 17 Demolition Project 2008  
Last Signature: 12/2/2008  
Expiration: None.
94. Programmatic Agreement Among the Bureau of Land Management, Southwestern Region Three U.S. Forest Service, U.S. Fish and Wildlife Service, Interior Region Eight, Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Effects of Vegetation And Range Management Activities In Arizona  
Last Signature: 6/23/2023  
Expiration: 6/23/2033
95. Programmatic Agreement Among the Advisory Council of Historic Preservation, National Guard Bureau, Arizona Department of Emergency and Military Affairs and Arizona State Historic Preservation Office, For Management Of The Camp Navajo Historic District 2009  
Last Signature: 1/4/2010  
Expiration: 1/4/2030
96. Programmatic Agreement Among National Guard Bureau, Missouri Army National Guard, the Missouri State Historic Preservation Office, and the Advisory Council on Historic Preservation Regarding Management, Repair, and New Construction of Facilities at Camp Crowder Training Site, Camp Clark Training Site, Macon Training Site, and Ike Skelton Training Site, Missouri  
Last Signature: 9/15/2015  
Signature: 9/15/2025 (undergoing renewal as of August 2025)
97. Programmatic Agreement Among National Guard Bureau, Missouri Army National Guard, and the Missouri State Historic Preservation Officer Regarding Maintenance, Repair, Training, and Construction for Readiness Centers and Ancillary Facilities, Missouri  
Last Signature: 8/16/2022  
Expiration: 8/16/2032

98. Memorandum of Agreement Among the National Guard Bureau, The New York Army National Guard, and The New York State Historic Preservation Officer Regarding the 69th Regiment Armory Rehabilitation Project 68 Lexington Avenue, New York, NY  
Last Signature: 7/23/2023  
Expiration: 7/23/2028
99. Nationwide Programmatic Agreement for Army National Guard Readiness Centers Maintenance and Repair Among the National Guard Bureau, The National Conference of State Historic Preservation Officers, The Army Federal Preservation Officer and The Advisory Council on Historic Preservation (note: AK ARNG using)  
Last Signature: 12/10/2010  
Expiration: 12/20/2030
100. Programmatic Agreement Among the National Guard Bureau, The Alaska Army National Guard, The Alaska Department of Military and Veteran Affairs, The Alaska State Historic Preservation Officer, and The Advisory Council on Historic Preservation Regarding the Divestiture of Readiness Center Buildings and Land Throughout Alaska (AKARNG using)  
Last Signature: 3/15/2017  
Expiration: 3/15/2027
101. Programmatic Agreement Among the National Guard Bureau, The Oregon Army National Guard, The Oregon State Historic Preservation Office, And The Advisory Council On Historic Preservation For The Camp Umatilla Oregon Expansion, Development And Operations Project 2018  
Last Signature: 9/18/2018  
Expiration: 9/18/2028
102. Programmatic Agreement Among the Wyoming Military Department, National Guard Bureau, Wyoming Bureau of Land Management, Wyoming State Historic Preservation Officer, And the Advisory Council on Historic Preservation Regarding Operations, Maintenance, Construction, And Training Actions at Wyoming Army National Guard Properties Throughout Wyoming  
Last Signature: 12/13/2018  
Expiration: 12/13/2033
103. Memorandum Of Agreement Among the National Guard Bureau, The Wyoming Military Department, And Wyoming State Historic Preservation Office to Resolve Adverse Effects From Upgrades to the .50 Caliber Machine Gun Range  
Last Signature: 9/1/2021  
Expiration: 9/1/2026
104. Memorandum of Agreement Among the National Guard Bureau, Indiana Army National Guard, and the Indiana State Historic Preservation Officer for the Construction of an Economically Undeveloped Airport and Runway and Subterranean Tunnels in Training

Area Echo at the Muscatatuck Urban Training Center located in Butlerville, Jennings County, Indiana (2020)  
Last Signature: 8/27/2020  
Expiration: 8/27/2025

105. Memorandum Of Agreement Between the Department of Military and Veterans Affairs and The Pennsylvania Historical and Museum Commission, State Historic Preservation Officer, Regarding Demolition at Fort Indiantown Gap, Lebanon County  
Last Signature: 8/28/2020  
Expiration: 8/28/2025

106. Programmatic Agreement Among the National Guard Bureau, Michigan Department of Military Veterans and Affairs, Michigan Army National Guard, The Advisory Council on Historic Preservation, And the Michigan State Historic Preservation Officer Regarding Routine Operation, Maintenance, Development, And Training Activities At The Fort Custer Training Center, Kalamazoo And Calhoun Counties, Michigan  
Last Signature: 5/25/2023  
Expiration: 5/25/2033

107. Memorandum of Agreement Among the National Guard Bureau, Michigan Army National Guard, and the Michigan State Historic Preservation Officer for the Sault Ste. Marie Readiness Center Addition/Alteration: 2025  
Last Signature: 2/3/2025  
Expiration: 2/3/2030

108. Memorandum Of Agreement Among the National Guard Bureau, The Delaware Army National Guard, and the Delaware State Historic Preservation Office Regarding the Proposed Demolition of Wings A and B at the Wilmington Readiness Center, New Castle County, Delaware 2020  
Last Signature: 12/8/2020  
Expiration: 12/8/2025

109. Memorandum Of Agreement among the National Guard Bureau, the Kentucky Army National Guard, and the Kentucky Heritage Council for the Demolition of the Chimney at the Carrollton Armory in Carroll County, Kentucky  
Last Signature: 10/3/2023  
Expiration: 10/3/2025

110. Memorandum Of Agreement among the National Guard Bureau, the Wyoming Military Department and the Wyoming State Historic Preservation Officer Regarding Mitigation of Adverse Effects from Disposal of The Lovell Armory, 48BH3787  
Last Signature: 12/10/2024  
Expiration: 12/10/2034

111. Memorandum of Agreement among the National Guard Bureau, the Wyoming Military Department, and the Wyoming State Historic Preservation Office for the Implementation

of the Camp Guernsey Joint Training Center Installation Development Plan within the  
Camp Guernsey Joint Training Center Canton Historic District  
Last Signature: 8/12/2025  
Expiration: 8/12/2035

112. Memorandum of Agreement (MOA) Among the National Guard Bureau, Rhode Island Army National Guard, the Rhode Island State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Demolition Of Multiple Quonset Hut Structures and Future Construction on North Drill Field, Camp Fogarty Training Site, East Greenwich, RI.
113. Memorandum of Agreement for Section 106 Compliance Knoxville-Sutherland Readiness Center Renovation, Knoxville, TN  
Last Signature: 5/5/2023  
Expiration: 5/5/2028
114. Memorandum of Agreement Among the National Guard Bureau, the Alaska Army National Guard, the Alaska Department Of Military And Veteran Affairs, and the Alaska State Historic Preservation Officer for the Demolition of Building 57427 on Camp Carroll, in Joint Base Elmendorf-Richardson, Alaska, 2025.
115. Memorandum of Agreement Among the National Guard Bureau, Michigan Army National Guard, and the Michigan State Historic Preservation Officer for the Midland Readiness Center Addition/Alteration, 2025.