Section 106 Mitigation Strategies

For Resolution of Adverse Effects to North Carolina's Historic Properties



catalog created by

The Environmental Review Branch of the
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Thank you for your hard work and legendary focus;
without it this project would not have been possible.

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Thank you for your many diligent years of service
to the constituents of North Carolina.

Introduction:

This catalog is designed to introduce consulting parties and the interested public to commonly used mitigation strategies in a Section 106 consultation. First, key terms related to Section 106 mitigation strategies are outlined. Secondly, a list of commonly used mitigation strategies organized into 5 broad categories is given, including picture aids. Within this list are links to external resources that provide more in-depth information on that mitigation strategy and/or project.

This catalog will describe many of the types of strategies used to resolve adverse effects to historic properties in North Carolina since the formation of the Office of State Archaeology (OSA) and the State Historic Preservation Office (HPO). However, it is by no means exhaustive and should be considered only as a starting point for discussion.

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Key Terms

1. **Section 106:** A section of the 1966 National Historic Preservation Act which requires federal agencies to evaluate whether their actions, or "undertakings," will have adverse effects on historic resources before moving forward.
2. **National Register of Historic Places (NRHP):** The NRHP is the Federal Government's official list of districts, sites, buildings, structures, and objects deemed worthy of preservation for their historical significance or great artistic value. For a place to be listed in the NRHP, it has to meet certain criteria, including having an association with significant events or people, embodying distinctive architectural styles or construction methods, or being likely to yield information important in history or prehistory.
3. **Study-Listed/Determined Eligible/National Register-Listed:** If a place is listed in the NRHP, it is protected by Section 106. The Study List is North Carolina's smaller version of the NRHP, and it lists properties that might be eligible for inclusion in the NRHP or that merit further investigation. Generally, places that are study-listed or that are eligible for inclusion in the NRHP receive the same level of Section 106 consideration as a place that is NRHP-listed.
4. **Historic Place/Site/Property:** Any prehistoric or historic district, site, building, structure, or object that is included in or is eligible for inclusion in the National Register of Historic Places.
5. **Project:** For the purposes of this catalog, "project" refers to "undertaking," which is an activity or program that is either: funded in whole or in part under the direct or indirect jurisdiction of a federal agency; carried out by or on behalf of a federal agency; carried out with federal financial assistance; requiring a federal permit, license, approval, or permission; and/or subject to state or local regulation administered pursuant to a delegation or approval by a federal agency.
6. **(Adverse) Effect:** An effect is any alteration to those characteristics of a historic property that qualify it for inclusion in or eligibility for the NRHP. An adverse effect is any effect that would alter the historic property in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, and/or association. Adverse effects are not just those that are certain to happen, but also those that are likely in the foreseeable future.
7. **Memorandum of Agreement (MOA):** If a Section 106 consultation determines there will be adverse effects to a historic property, consulting parties will sign either an MOA or a PA, which are documents including stipulations for mitigating adverse effects to historic places. MOAs are usually developed for discrete projects after potential effects have been fully assessed.
8. **Programmatic Agreement (PA):** PAs are documents including stipulations for mitigating adverse effects to historic places and are usually developed for complex projects with phased identification or with large APEs.

9. **Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER):** Sometimes, an MOA or PA will ask for documentation of historic properties meeting HABS or HAER guidelines. HABS and HAER are collections of historic, architectural, engineering, and cultural landscape documentation held by the Library of Congress.
10. **Secretary of the Interior Standards and Guidelines:** Section 106 mitigation strategies will often require certain actions to meet Secretary of the Interior Standards. These standards are a series of concepts about preserving, rehabilitating, restoring, and reconstructing historic properties. The Secretary of the Interior Guidelines offer general design and technical recommendations to assist in applying the Standards to specific properties.
11. **Phased Identification Program:** Phased Identification Programs take a flexible approach to identifying historic places, effects, and solutions. They are implemented over longer periods of time when measures to mitigate adverse effects can be effectively incorporated, and they ease the burden of time constraints and access issues.
12. **Area of Potential Effects (APE):** The APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if such properties exist.



Figure 1. Office of State Archaeology staff performing Ground Penetrating Radar (GPR) within the confines of a cemetery.

Mitigation Strategies – Archaeology

Archaeology mitigation strategies, broadly, aim to identify, obtain information from, and/or protect archaeological sites from damage incurred from a given project now and in the foreseeable future.

1. Data Recovery

What is Data Recovery? If an NRHP-eligible archaeological site cannot be avoided and will be adversely affected by a proposed project, a common mitigation type is data recovery. Data recovery excavations are intended to retrieve as much of the information that makes the site historically significant as possible prior to its destruction. A data recovery excavation is normally narrow in scope and focuses on the portions of the archaeological site that will be lost due to construction and is the most common form of mitigation for adverse effects to archaeological sites on land. In underwater archaeology, recovery can focus on stand-alone objects like anchors, cannons, etc. In these situations, adequate consideration must be given to conservation costs for artifacts recovered from a marine environment. For shipwrecks, a detailed site map is an essential part of data recovery, and sampling strategies are dependent on the level of impact caused by the

project. Maritime site excavation/mitigation strategies pose a significant cost compared to terrestrial mitigation – the deployment of vessels and their fuel, of trained divers, time, and equipment needed must all be factored into the DRP.

What is a Data Recovery Plan, the first step of Data Recovery? A Data Recovery Plan (DRP) is the initial step in the data recovery process. The DRP outlines specific methods and procedures for excavating, documenting, and analyzing archaeological sites, artifacts, and other resources affected by ground-disturbing activities. Given the individual nature of each archaeological site, a data recovery plan that includes reporting and curation requirements will be developed through consultation among the principal investigator (a professional archaeologist), the staff of the OSA, consulting parties including representatives of descendant communities, and representatives of the federal or state agency project sponsors.

Example 1 of when Data Recovery was used: A DRP was used in the Spinning Mill Lofts project in Clayton County, ER 18-0492. As in many cases, more than one mitigation strategy was combined to maximize the recovery and accessibility of the information about the history of the site.

> **Project Description:** Spinning Mill Investments, LLC, planned to rehabilitate the historic Clayton Spinning Mill building using US Department of Housing and Urban Development funds. The ground-disturbance resulting from this rehabilitation would adversely affect four archaeological sites that were determined eligible for listing in the NRHP: 31JT555, 31JT556, 31JT557, and 31JT558.
>
> **Type of Site:** 31JT555: a precontact Native American site. 31JT556, 31JT57, and 31JT558: an early 20th century mill, tenant housing for workers, and industrial areas.
>
> **Level of Excavation:** Phase III. In the first two phases of archaeological testing, the sites were identified and their boundaries delineated. In Phase II of the project, further testing and detailed mapping and documentation of the identified sites by historical archaeologists led to an accurate evaluation of the sites' NRHP eligibility. Once it was determined that adverse effects to the eligible archaeological resources could not be avoided in the construction needed to rehabilitate the building, a DRP was developed for Phase III excavations and mitigation in the areas of impact. This plan included methods beyond archaeological excavation, including additional archival research into the mill's history, Remote Sensing such as GPR and metal detecting, photo documentation of archaeological features, and both digital and hardcopy public education materials to maximize the amount of information recovered and made available to the public.
>
> **Duration of Mitigation:** Once the DRP, including a timetable for deliverables, had been approved and an MOA signed among the consulting parties, all data recovery fieldwork was completed prior to construction. Data analysis was completed within the 16-month time limit after fieldwork completion. In the case of this project, it took 14 months total

from the time the DRP and MOA were approved for fieldwork to be completed, archival research to be finished, lab analyses to be performed, and report drafts and revisions to be accepted and a final report submitted.

Deliverables and Deadlines: A Management Summary describing in brief the results of the data recovery excavations, due as usual within 30 days of fieldwork completion, and a Final Report, due within the usual 16 months of fieldwork completion.

Example 2 of when Data Recovery was used: A DRP was used in the I-85 Corridor Business Park project, ER 14-1900.

Project Description: Davidson County planned to use Community Development Block Grant funds from the US Department of Housing and Urban Development to develop a Business Park. The development of this park would have an adverse effect on the Beallmont House (DV0007) a property listed in the NRHP. While Davidson County had already hired an archaeologist to survey the area of the proposed park, they had not surveyed the area comprising the Beallmont House.

Type of Site: Early 19th century farmhouse.

Level of Excavation: Phase 1, also known as a survey.

Duration of Mitigation: Fieldwork was completed prior to relocation. Survey and testing results were sent to SHPO within 120 days of MOA execution.

Deliverables and Deadlines: A survey and testing report were due within 120 days of MOA execution.

2. Monitoring

What is Monitoring? Monitoring is the careful, systematic observation and documentation of archaeological resources through observation during ground-disturbing activities. On-site, certified professional archaeologists watch to see if ground-disturbing activities expose any archaeological resources, and if so, they call for work to be paused and record in detail the cultural resources' location, nature, and condition. Monitoring is often used in combination with other archaeology mitigation strategies, or when the area that will be adversely affected is not extensive. If artifacts or cultural features are observed during monitoring, Data Recovery is often performed. If no artifacts or cultural features are observed during monitoring, a Monitoring Report of approximately 10 pages is required.

Example 1 of when Monitoring was used: Monitoring was used in the Cape Fear Community College Parking Deck project in New Hanover County, CH 06-3091.

Project Description: Cape Fear Community College planned to construct a five-level parking deck within the Wilmington Historic District, a property listed in the National Register. The construction would require the demolition of historic brick and masonry retaining walls.

Type of Site: Historic Antebellum Retaining Wall.

Level of Excavation: N/A - Not Applicable.

Duration of Mitigation: The Monitoring by a qualified archaeologist was required during the entirety of the demolition of the historic masonry walls to ensure that no cultural resources were exposed.

Deliverables and Deadlines: Upon completion of the monitoring, the archaeological consultant prepared and submitted a Monitoring Report to SHPO and HPC. Additionally, for this project, public education and interpretation in the form of an exhibit installed in the new parking deck for the public to read about the history of the site was included in the mitigation plan.

Example 2 of when Monitoring was used: Monitoring was used in the New Salem Road Culvert project, ER 07-1169.

Project Description: NCDOT planned to use a permit from the US Army Corps of Engineers to replace a tile culvert on New Salem Road in Randolph County. This replacement would adversely affect the existing tile culvert, a property determined eligible for listing in the NRHP.

Type of Site: Early 20th century culvert.

Level of Excavation: N/A - Not Applicable.

Duration of Mitigation: NCDOT Division 8 informed NCDOT's Archaeology Group 48 hours in advance of when ground disturbing activities were scheduled. The monitoring occurred during the entirety of ground disturbing activities on site.

Deliverables and Deadlines: Monitoring activities may include cleaning and photographing areas exposed during construction, mapping both plan and profile views of open trenches and culvert cross-sections, and collecting ceramic tiles, materials, or artifacts exposed during construction. Should significant archaeological resources be identified during monitoring, the consulting parties will decide if additional mitigation is necessary and, if so, develop an appropriate treatment plan.

3. Public Education and Interpretation

What is public education and interpretation? Public interpretation is often an important element in any mitigation plan because it provides a way for information generated through data recovery to be shared with the public, long after the affected portion of the archaeological site is destroyed by the construction project. While the technical reports are curated at the Office of State Archaeology for future research, public education and interpretation materials are more accessible and designed to share information effectively to the widest audience possible. These approaches can be very creative and use digital humanities platforms, apps, Story Maps, on- or off-site exhibits, signage, and other forms of media to share knowledge about the site and its history.

Example 1 of when Public Interpretation and Outreach was used: Public Interpretation and Outreach was used in the Central Carolina Intermodal Facility & CSX Line of Road Improvements project in Nash and Edgecombe Counties, ER 17-0859.

> **Project Description:** CSX Transportation and NCDOT planned to use a US Army Corps of Engineers permit to construct the CSX Intermodal Facility and perform improvements to the CSX Transportation Second Mainline. These activities would adversely affect the NRHP-eligible Odom-Cooper-Flye Farm and its 6 contributing archaeological sites.
>
> **Type of Site:** Late 19th century farmhouse.
>
> **Level of Excavation:** N/A - Not Applicable.
>
> **Duration of Mitigation:** For the duration of the project, CSX's consultant provided OSA with text and supporting media (graphics and photographs) highlighting the findings and progress of the data recovery. OSA posted these materials on the OSA website.
>
> **Deliverables and Deadlines:** CSX's consultant provided OSA with 3-5 media packages, as well as a public-audience summary of data recovery findings which was given to OSA within 18 months of fieldwork completion.

Example 2 of when Public Interpretation and Outreach was used: Public Interpretation and Outreach was used in the Spinning Mill Lofts project in Clayton County, ER 18-0492.

Project Description: Spinning Mill Investments, LLC, planned to rehabilitate the historic Clayton Spinning Mill building using US Department of Housing and Urban Development funds. The ground-disturbance resulting from this rehabilitation would adversely affect four archaeological sites that were determined eligible for listing in the NRHP: 31JT555, 31JT556, 31JT557, and 31JT558.

> **Type of Site:** 31JT555: a precontact Native American site. 31JT556, 31JT57, and 31JT558: an early 20th century mill, tenant housing for workers, and industrial areas.
>
> **Level of Excavation:** N/A - Not Applicable.

Duration of Mitigation: To preserve the stories and lifeways of those who grew up in and worked at the mills while making their history more widely known to the public, a mass mailing was organized to solicit the public for photos and remembrances of the mills while they were in operation. In cases where this solicitation identified people who had worked and/or lived at the mills, unstructured interviews were conducted.

Deliverables and Deadlines: Spinning Mill Investments, in consultation with SHPO and OSA, sent mass solicitations to residents of the area to ask for photos and remembrances related to the mill and, when possible, conducted unstructured interviews with former residents and workers at the mills.

4. Remote Sensing

What is Remote Sensing? Remote Sensing is a way to detect potential archaeological resources from a distance and is especially useful in areas of interest that have substantial vegetative cover or other characteristics which makes traditional surveying and subsurface testing difficult. Some examples of remote sensing include satellite imaging, aerial photography, light detection and ranging (LiDAR), and geophysical techniques like ground-penetrating radar (GPR), magnetometry, systematic metal detection, as well as side-scan sonar, sub bottom profiling, multibeam, and other acoustic survey tools in maritime archaeology. These methods are sometimes incorporated into a mitigation plan as a step in data recovery but are never used alone because physical archaeological testing is required to confirm that any targets recorded using these tools are, in fact, archaeological resources. This is known as "ground-truthing," and is most commonly used in Phase II testing to help determine if a site is eligible for the NRHP.

What is GPR, a common Remote Sensing tool? GPR, specifically, is used to gather data about the presence and depth of buried features at a site that may be archaeological deposits before ground-disturbing activities occur. Field conditions, such as saturated ground, tree roots, debris, and rocks can affect GPR survey results. Because detection accuracy depends on soil contrast and reflectivity, post processing the data using software is needed to evaluate the shape and depth of any anomalies recorded. While certain characteristics suggest that anomalies may represent certain types of cultural features (e.g., a buried pipe), archaeological excavation is required to confirm what the anomaly is and record its historical context, such as relative age, function, and how it came to be buried in that location.

Example 1 of when Remote Sensing was used: Remote Sensing, specifically GPR, was used in the Leigh Family Cemetery project in Durham County, ER 21-2303.

Project Description: EPCON Farrington Road, LLC, planned to construct a residential facility using one or more federal permits from the US Army Corps of Engineers. This construction would adversely affect the Walter Curtis Hudson Farm and Store, a property listed in the NRHP. Although the project did not directly affect another historic

property, Leigh Farm Park, the park was assessed due to its historical connection with the Walter Curtis Hudson Farm and Store. SHPO requested that GPR be performed on Leigh Farm to confirm the presence of marked burials and ascertain the locations of potential unmarked burials of enslaved persons to establish an adequate buffer around the cemetery to avoid disturbing any graves. In the case of historic cemeteries, it is not as necessary to ground-truth the anomalies because the purpose is to evaluate the extent of burials that may go beyond the known limits of a cemetery and avoid disturbance.

Type of Site: Historic 19th Century Farm.

Level of Excavation: N/A - Not Applicable.

Duration of Mitigation: The GPR survey was completed within 12 months of the execution of the agreement and within 6 months after written approval from the landowner, O. W. Hudson Trust, had been received.

Deliverables and Deadlines: A GPR Survey Report was due within 12 months of the execution of the agreement. SHPO/OSA had 60 days to review and comment. The final draft was submitted within 60 days of receipt of SHPO/OSA comment.

Example 2 of when Remote Sensing was used: Remote Sensing, specifically LiDAR, was used in the Guilford County Pipe No. 40 project in Guilford County, ER 19-1707.

Project Description: NCDOT planned to replace Pipe No. 40, a structure eligible for listing in the National Register, using a federal permit from the US Army Corps of Engineers.

Type of Site: Historic terra-cotta tile pipe.

Level of Excavation: N/A - Not Applicable.

Duration of Mitigation: The LiDAR scans and renderings were made prior to the start of construction.

Deliverables and Deadlines: If significant archaeological resources were encountered, the NCDOT Archaeology Team had the authority to halt all construction work at the location and assess the need for further archaeological excavations. No work resumed until the NCDOT Archaeology Team gave D-7 the approval to continue.

5. Preservation in Place and Buffering

What is preservation in place and buffering? Some archaeological sites are so sensitive that protecting them where currently are is the only feasible option to resolve adverse effects of construction in an area. Archaeological testing using Data Recovery or Remote Sensing techniques are used to identify the resources and determine their extent so that an adequate protective buffer

can be established for constructing around the resources. A typical example of situations that call for Preservation in Place and Buffering is when there are marked or unmarked human graves in a location. Buffering is also routinely used as a mitigation strategy for maritime archaeological sites. Buffer distance can vary, depending on the type of cultural feature and the input provided by consulting parties involved in a project. Often the range is between 15 and 100 meters. For some types of resources, such as underwater sites, reburial via sediment deposition may also be an appropriate mitigation strategy after the site is adequately mapped.

Example 1 of when Preservation in Place and Buffering was used: Preservation in Place and Buffering was used in the Durham to Raleigh Regional Rail project in Durham and Wake Counties County, ER 98-0644.

> **Project Description:** The Federal Transit Administration planned to construct the Phase I Regional Rail System between Durham and Raleigh. This construction would adversely affect the West Raleigh Historic District, Mordecai Historic District, Raleigh Cotton Mill, American Tobacco Manufacturing Plant, NC State University Campus Historic District, Southern Railway Bridge, Seaboard Railroad Bridge, Raleigh Hosiery Mill, and J.S. Dorton Arena at the NC State Fairgrounds, properties listed in or eligible for listing in the NRHP, and may also have an effect on known or potential archaeological sites that exist or may exist in the area.
>
> **Type of Site:** 19 known sites and 17 potential sites from a Phased Identification Program, including cement and metal foundations, a probable Brassfield station house, and historic cemeteries.
>
> **Level of Excavation:** N/A - Not Applicable.
>
> **Duration of Mitigation:** The Federal Transit Administration completed a records search to identify sites that appeared to be within the project APE. Because of lack of access and absence of detailed design, the archaeological APE could not be fully investigated or identified, and so the Federal Transit Administration agreed to undertake a Phased Identification Program. During the Program, sites that were identified could be preserved in place.
>
> **Deliverables and Deadlines:** In an archaeological report, further fieldwork was suggested for some sites, while others were to be preserved in place as they were outside the LPE.

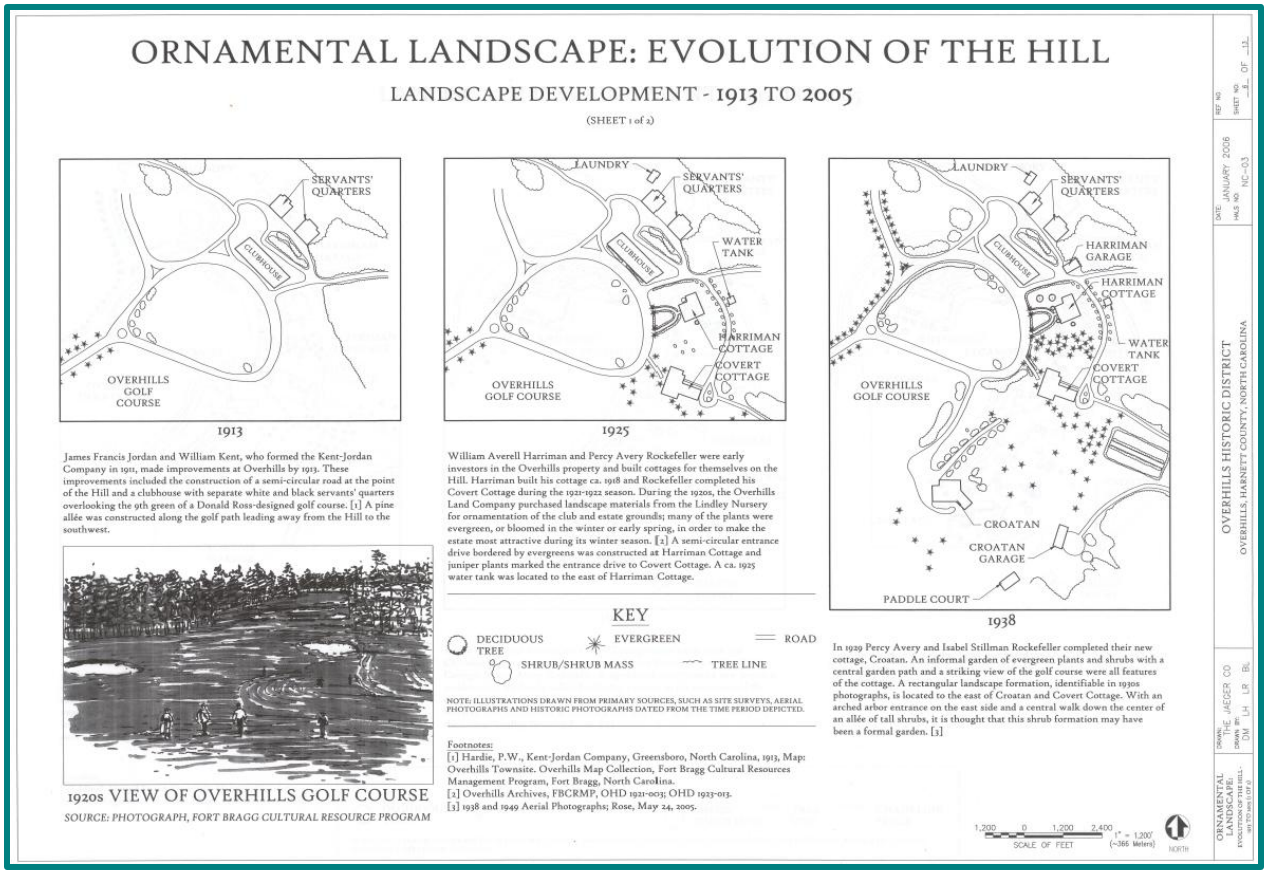


Figure 2. Measured drawings of the Overhills Historic District ornamental landscape with context descriptions.

Mitigation Strategies – Recordation

Recordation mitigation strategies, broadly, aim to capture the significant architectural, engineering, and/or design elements of historic structures so that there is a record of them after demolition or alteration of the historic structure.

1. Photography

What is Photography? Taking photographs of images, either traditionally or digitally, allows historic properties and cultural resources to be documented at a point in time. Photographs of different viewpoints of a structure are often recommended as mitigation when that structure will be demolished, as a part of a Recordation Plan. Recordation Plans are usually included as appendices to MOAs. Sometimes, photography can include videos.

Example 1 of when Photography was used: Photography was used in the Potts Street Extension project in Mecklenburg County, ER 17-0513.

Project Description: NCDOT planned to extend Potts Street using a permit from the US Army Corps of Engineers. This extension would have an adverse effect on the Davidson Historic District, MK2442, which is listed in the NRHP.

Type of HP: 19th-20th century college town district.

Duration of Mitigation: Photographs were taken prior to construction.

Deliverables and Deadlines: Digital photographs were taken of the elevations, oblique views, and interior of 335 Sloan Street, a contributing resource within the Historic District that would be affected by the construction.

Example 2 of when Photography was used: Photography was used in the Tarboro Savings Bank project in Edgecombe County, ER 19-0028.

Project Description: Tarboro Savings Bank planned to acquire Federal Deposit Insurance Corporation approval to construct a new branch location. Constructing the new bank branch would require the demolition of the Edgecombe County Courthouse Annex, a contributing resource within the Tarboro Historic District, a property listed in the NRHP.

Type of HP: Contributing resource within 1760-1930 district.

Duration of Mitigation: Photographs were taken prior to demolition.

Deliverables and Deadlines: Digital photographs were taken of overall views of the Annex, each visible elevation of the Annex, details of construction or design of the Annex, and streetscapes showing the relationship of the Annex to the street and adjoining properties.

2. Drawings

What are Drawings? Drawings often are components of Historic American Building Survey (HABS) and Historic American Engineering Record (HAER) documentation, which is frequently requested if an architecturally significant structure will be demolished or otherwise lose its integrity. Measured drawings can be done by hand or with the help of computers (CAD) and are typically made for different stories of a historic structure as well as its site plans. Requirements for Drawings, like those for Photography, are often listed in the Recordation Plan included as an appendix to an MOA.

Example 1 of when Drawings were used: Drawings were used in the Charlotte Douglas International Airport Enhancement and Demolition project, ER 20-0438.

Project Description: The City of Charlotte planned to use funding from the Federal Aviation Administration to demolish the Old Terminal Building at the Charlotte Douglas International Airport. This would have an adverse effect on the Old Terminal Building, a property eligible for listing in the NRHP.

Type of HP: Modernist air terminal.

Duration of Mitigation: The Level II HABS was required to be completed prior to demolition.

Deliverables and Deadlines: The Level II HABS was required to be submitted to SHPO for approval, and SHPO was to provide written acceptance of the Level II HABS within 30 calendar days of receipt.

Example 2 of when Drawings were used: Drawings were used in the Lee Field House Complex Demolition project in Fort Bragg, Cumberland County, ER 10-2101.

Project Description: Fort Bragg planned to demolish the Lee Field House Complex after determining that it was not economically feasible to renovate and repair the Complex to Army fitness facility standards. This demolition would have an adverse effect on the Lee Field House Complex, which was determined eligible for listing in the NRHP in 2006, and the historic Long Street and Sandy Grove Presbyterian Churches.

Type of HP: Early-mid 20th century military community development.

Duration of Mitigation: The Level I HABS and Three-Dimensional Imaging was completed prior to demolition.

Deliverables and Deadlines: The Level I HABS and Three-Dimensional Imaging was submitted to SHPO for approval no later than 1 year from MOA execution.

3. Architectural Survey

What is an Architectural Survey? The goal of Architectural Surveys is to identify historic buildings, structures, sites, and objects in a given area. Certified Architectural Historians who meet Secretary of the Interior qualifications will review historical records, conduct fieldwork, and sometimes write contexts and individual resource descriptions when completing an Architectural Survey. Surveys may or may not include evaluations for NRHP eligibility.

Example 1 of when an Architectural Survey was used: An Architectural Survey was used in the Oldham Tower and Liberty Street Apartments Demolition project in Durham County, ER 20-0589.

Project Description: The City of Durham planned to use HUD funds to demolish Oldam Tower and the Liberty Street Apartments. This demolition would have an adverse effect

on Oldam Tower and the Liberty Street Apartments, properties eligible for listing in the NRHP.

Type of HP: 1969 7-story flat roof C-shaped concrete and other modernist structures.

Duration of Mitigation: The Architectural Survey was completed prior to demolition.

Deliverables and Deadlines: An Architectural Survey was submitted to SHPO within 90 days of MOA execution.

Example 2 of when an Architectural Survey was used: An Architectural Survey was used in the Charlotte Gateway Station and Track Access project in Mecklenburg County, ER 15-2204.

Project Description: The City of Charlotte and NCDOT planned to use Federal Railroad Administration funds to construct an intercity passenger rail. This construction would have an adverse effect on the Southern Railway Station, which FRA previously determined to be eligible for listing in the NRHP.

Type of HP: Late 19th century railroad, known for being the first major railroad in North America to fully dieselize its train service.

Duration of Mitigation: The Architectural Survey was completed prior to construction.

Deliverables and Deadlines: A Scope of Work was submitted prior to fieldwork; an HPO Survey Site Form was completed for each newly identified resource or an updated Survey Site Form was completed for already identified resources; a report which discussed the former railroad corridors and infrastructure histories and NRHP evaluations was written; and shapefile data was added to the SHPO HPOWEB GIS Service, all of which was submitted to SHPO within 5 years of MOA execution.

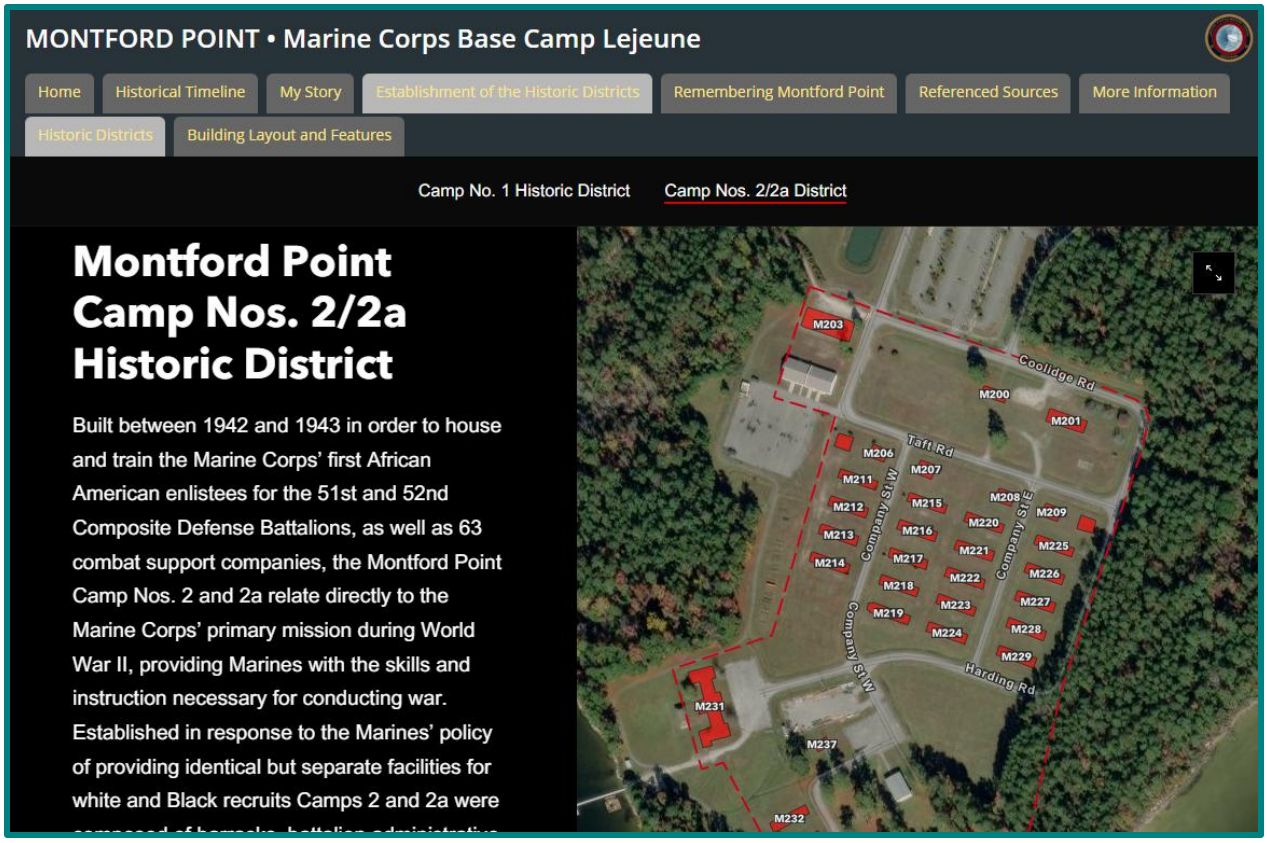


Figure 3. A screenshot of the Montford Point Camp 1 and Camp 2/2A Historic Districts Story Map, integrating historical narratives and aerial photography.

Mitigation Strategies – Interpretation

Interpretation mitigation strategies, broadly, aim to engage the public with the project at hand by educating them on the significance of affected historic places and providing resources on how to be involved in preservation efforts.

1. Signage

What is Signage? Signage is used to identify nearby historic places, including individual historic resources and larger historic districts. Signage is typically smaller in scale than public displays and works best when the signs are placed in areas where lots of people will see them. Signs should be able to endure weather changes, and their maintenance is often the responsibility of local municipalities or organizations.

Example 1 of when Signage was used: Signage was used in the Bridge No. 88 Replacement project in Anson County, ER 06-0965.

Project Description: The Federal Highway Administration planned to demolish and replace Bridge No. 88, and this replacement would have an adverse effect on Bridge No. 88, a property eligible for listing in the NRHP.

Type of HP: Early 20th century bridge.

Duration of Mitigation: Plaques were salvaged and distributed prior to demolition.

Deliverables and Deadlines: Bridge No. 88's 2 plaques were salvaged prior to demolition and given to NCDOT Highway Division 10 and the Ansonville Historical Society.

Example 2 of when Signage was used: Signage was used in the Craven Terrace Rehabilitation project, ER 14-1803.

Project Description: The Housing Authority of the City of New Bern planned to use US Department of Housing and Urban Development funds to rehabilitate Craven Terrace. This would have an adverse effect on Craven Terrace, a property listed in the NRHP.

Type of HP: 1941/1953 brick one- and two-story public housing.

Duration of Mitigation: The signs were erected by the time that the rehabilitation is completed.

Deliverables and Deadlines: 7 signs identifying and explaining significant historical events that pertain to the African American heritage within the Craven Terrace neighborhood were erected by the time that rehabilitation is completed.

2. Oral Histories

What are Oral Histories? Collecting Oral Histories via interviews is a way to both obtain information about a historic place and to connect with local community members about that historic place. Interviewers first receive training on conducting Oral Histories, and then interview a specified number of relevant people for a specified amount of time. Oral Histories are useful when the historic character of a place is closely tied to its stewards and when those stewards are available for interview.

Example 1 of when Oral Histories were used: Oral Histories were used in the Widening of NC 3 project in Cabarrus County, CH 07-2063.

Project Description: NCDOT planned to use a permit from the US Army Corps of Engineers to widen NC 3 in Cabarrus County. This widening would have an adverse effect on the Juniper-Pine-Mooresville-Chestnut Mill Village and Frog Hollow Mill Village, 2 districts eligible for listing in the NRHP.

Type of HP: Historic Mill Village Districts.

Duration of Mitigation: NCDOT had until the expiration of the US Army Corps of Engineers permit to complete conducting the Oral Histories.

Deliverables and Deadlines: Oral Histories were gathered from residents of the mill villages.

Example 2 of when Oral Histories were used: Oral Histories were used in the Robert R. Taylor Homes Demolition project in New Hanover County, ER 03-1270.

Project Description: The Wilmington Housing Authority planned to use Department of Housing and Urban Development funds to demolish units that comprise the Robert R. Taylor Homes and Robert R. Taylor Homes and Annex. This demolition will have an adverse effect on the Robert R. Taylor Homes and the Robert R. Taylor Homes and Annex, properties eligible for listing in the NRHP.

Type of HP: Historic African American affordable housing complex.

Duration of Mitigation: Oral Histories were submitted to the local public library for preservation and public use.

Deliverables and Deadlines: Oral Histories of long-term residents were submitted to the local public library.

3. Story Maps

What are Story Maps? Story Maps are webpages that use geographic maps, photographs, and historical narratives to educate viewers on persons, events, and structures significant to a historic place. Story Maps may include a space for viewers to share personal anecdotes relevant to the historic place, and in this way Story Maps are living documents.

Example 1 of when a Story Map was used: A Story Map was used in the Camp Lejeune Infrastructure Reset project at Camp Lejeune in Onslow County, ER 18-1217.

Project Description: The US Marine Corps, acting through Camp Lejeune, planned to demolish several buildings at Camp Lejeune as part of its Infrastructure Reset Strategy, which aimed to reduce excess and failing facilities across all Marine Corps installations and reduce operation and maintenance costs for facilities that no longer serve a mission-essential purpose or are in disrepair. This demolition would adversely affect the NRHP-listed Stone Bay Rifle Range Historic District, as well as the Assault Amphibian Base Historic District, Command Services/Regimental Area No. 3 Historic District, Montford Point Camp 1 Historic District, Montford Point Camp 2/2A Historic District, Naval

Hospital Historic District, and Parachute Training Historic District, properties eligible for listing in the NRHP.

Type of HP: 1941 marine base.

Duration of Mitigation: The Marine Corps developed 2 Story Maps: 1 for the Stone Bay Rifle Range Historic District, and 1 for the Montford Camp 1 and Camp 2/2A Historic Districts. SHPO had 60 calendar days to respond to the Stone Bay Rifle Range Historic District Story Map draft, and both SHPO and the Montford Point Marine Association had 60 calendar days to respond to the Montford Camp 1 and Camp 2/2A Historic Districts Story Map draft.

Deliverables and Deadlines: The Stone Bay Rifle Range Historic District was completed within 5 years of MOA execution, and the Montford Point Camp 1 and Camp 2/2A Historic Districts Story Map was completed within 2 years of MOA execution.

Example 2 of when a Story Map was used: A Story Map was used in the Ward's Mill Dam Demolition project in Watauga County, ER 20-0338.

Project Description: A partnership between American Rivers, Blue Ridge Resources Conservation and Development Council, and Mountain True planned to use one or more federal permits from the US Army Corps of Engineers to remove the Ward's Mill Dam, restoring natural river flow. This removal would have an adverse effect on the Ward Mill Complex and Dam, WT0358, which is eligible for listing in the NRHP.

Type of HP: Historic Dam.

Duration of Mitigation: The organizations in the partnership collectively submitted a draft of the Story Map to SHPO within 18 months of MOA execution. The final Story Map was submitted to SHPO within 2 years of MOA execution.

Deliverables and Deadlines: A GIS Story Map was made available to the public via the partnership agencies' websites for a period of no less than 5 years.

4. Public Displays

What are Public Displays? More detailed than Signage, Public Displays use text and illustration to explain to viewers the historic significance of a nearby historic place. Public Displays can take the form of exhibits, pamphlets, kiosks, and, in the case of historic bridges, inclusion in the Historic Bridges of NC website.

Example 1 of when a Public Display was used: A Public Display was used in the Alexander Farms Mixed Use Development project in Mecklenburg County, ER 19-1985.

Project Description: Alexander Farms planned to use a US Army Corps of Engineers permit to construct a mixed-use development. This construction would have an adverse effect on the J. Wilson Alexander Tenant House, MK2293, a property eligible for listing in the NRHP.

Type of HP: 1886 1-story side gable frame tenant house with German siding.

Duration of Mitigation: Alexander Farms provided a draft of the exhibit and monument plans to SHPO and Preserve Mecklenburg within 6 months of MOA execution. Alexander Farms provided a final draft of the plans to SHPO and Preserve Mecklenburg within 12 months of MOA execution.

Deliverables and Deadlines: An exhibit and monument were completed and installed within 2 years of MOA execution.

Example 2 of when a Public Display was used: A Public Display was used in the Bridge 212 Replacement project in Alleghany County, ER 13-0855.

Project Description: The US Army Corps of Engineers planned to replace Bridge 212 and this replacement would have an adverse effect on Bridge 212, a structure eligible for listing in the NRHP.

Type of HP: Historic bridge.

Duration of Mitigation: Bridge 212 was displayed on the Historic Bridges of North Carolina Website and will continue to be for as long as the website exists.

Deliverables and Deadlines: Bridge 212 was included on the website with photographs and a narrative history, submitted before the US Army Corps of Engineers determined that the MOA's terms had been satisfactorily fulfilled or NCDOT was unable or decided not to participate in the undertaking.

5. Narratives/Context Documents

What are Narratives/Context Documents? Narratives/Context Documents are purely textual, in-depth explorations of a historic place and significant persons, events, and stories that are relevant to it. They differ from the "brief histories" often included in Recordation Plans in that the latter focuses on short summaries of the history of a place for the sake of complementing the documentation, while Narratives/Context Documents have wide breadths of information that require intensive historical research.

Example 1 of when Narratives/Context Documents were used: A Narrative/Context Document was used in the US 221 Bypass of Rutherfordton project in Rutherford County, ER 00-7599.

Project Description: NCDOT planned to use a US Army Corps of Engineers permit to construct the US 221 Bypass of Rutherfordton. This construction would have adverse effects on both Ruth Elementary, a property determined eligible for listing in the NRHP, and sections of the Overmountain Victory National Historic Trail.

Type of HP: 1926 - 1951 1-story hip roof H-plan brick Classical Revival school with 1960 concrete block gymnasium, and a National Historic Trail.

Duration of Mitigation: All materials from the Ruth Elementary School and Overmountain Victory National Historic Trail that were needed to develop the Context Document were retrieved prior to construction.

Deliverables and Deadlines: A Context Document was completed and distributed within 3 years of MOA execution.

Example 2 of when Narratives/Context Documents were used: A Narrative/Context Document was used in the 401 Assemblage Construction project in Wake County, ER 20-0096.

Project Description: RST Development planned to use one or more federal permits from the US Army Corps of Engineers to construct 401 Assemblage, a residential development. This construction would have an adverse effect on the Dr. L. J. Faulhaber Farm, WA4811, a property eligible for listing in the NRHP.

Type of HP: c. 1935 2-story side gable brick Colonial Revival house.

Duration of Mitigation: RST Development's consultant requested from SHPO a list of previously recorded resources identified as "farms" within Wake County within 30 days of MOA execution. This consultant provided SHPO with a preliminary list of resources to be included in the Context Document within 60 days of MOA execution. After the survey and within the Context Document, the consultant wrote a recommendation for each context resource as "unlikely to be eligible/no further investigation recommended" or "likely to be eligible/further investigation recommended." The consultant provided SHPO with a Scope of Work for the Context Document within 90 days of MOA execution. An initial draft of the Context Document was submitted to SHPO within 12 months of MOA execution.

Deliverables and Deadlines: The final draft of the Context Document for farm complexes (1918-1968) in Wake County that detailed the rise and decline of agriculture's importance in Wake County's economy throughout the Interwar (1918-1941), World War II (1941-1945), and post-war (1945-1968) periods, was submitted within 2 years of MOA execution.

6. Public Meetings

What are Public Meetings? A less frequently used Interpretation mitigation strategy, Public Meetings are scheduled opportunities for members of consulting parties to discuss the project with the public and for the public to ask questions and share their thoughts. They are useful when there is heightened public awareness of a project.

Example 1 of when Public Meetings were used: Public Meetings were used in the US 321 Improvements project in Watauga and Caldwell Counties, CH 90-0697.

> **Project Description:** NCDOT planned to use a permit from the US Army Corps of Engineers to widen US 321 within the Town of Blowing Rock. The blasting required during construction would adversely affect the Green Park Historic District, WT0029, a district listed in the NRHP.
>
> **Type of HP:** Late 19th-early 20th century resort development.
>
> **Duration of Mitigation:** Prior to construction, NCDOT held a "kick-off" meeting. Citizens could directly contact the Resident Engineer and their assistants for the entire duration of the project.
>
> **Deliverables and Deadlines:** A "kick-off" meeting was held prior to construction.

Example 2 of when Public Meetings were used: Public Meetings were used in the Demolition and Elevation Within the Windsor Historic District project in Bertie County, ER 19-2621.

> **Project Description:** The Town of Windsor planned to use Federal Emergency Management Agency funding to demolish and elevate several properties as hazard mitigation. These properties are not individually eligible for listing in the NRHP but are contributing resources within the Windsor Historic District, and so the Windsor Historic District, BR0253, a district listed in the NRHP, would be adversely affected.
>
> **Type of HP:** 19th-early 20th century courthouse town.
>
> **Duration of Mitigation:** NC Division of Emergency Management's consultant participated in and facilitated 1 Public Meeting in Windsor during the background research and above-ground resource survey phase.
>
> **Deliverables and Deadlines:** A Public Meeting that allowed people to contribute pictures and histories that may not be available online or in books was held during the background research and above-ground resource survey phase.

7. Trainings

What are Trainings? If a project is occurring in an area with many historic places, trainings may be held to teach the public about historic tax credits, the Section 106 process, and generally about the history of their community. Trainings are proactive in that they address relevant questions and concerns in communities with many historic places before additional developments occur.

Example 1 of when Trainings were used: Trainings were used in the Henry Street Revitalization project in Halifax County, ER 11-2166.

> **Project Description:** The City of Roanoke Rapids planned to use US Department of Housing and Urban Development funds to demolish and rehabilitate several contributing resources to the Roanoke Rapids Historic District. This demolition and rehabilitation would adversely affect the Roanoke Rapids Historic District, HX1510, a district listed in the NRHP.
>
> **Type of HP:** Early 20th century textile town.
>
> **Duration of Mitigation:** The City of Roanoke Rapids hosted the Training within 12 months of MOA execution.
>
> **Deliverables and Deadlines:** A free workshop covering historic preservation tax credits and maintenance, repair, and energy efficiency in historic homes was held within 12 months of MOA execution.

Example 2 of when Trainings were used: Trainings were used in Fayetteville Veterans Administration Medical Center D-Wing Expansion project in Cumberland County, ER 14-2789.

> **Project Description:** The Fayetteville Veterans Administration Medical Center planned to demolish Building 8 in order to expand the D-Wing of Building 1. This demolition would have an adverse effect on Building 8, a contributing element in the Fayetteville Veterans Administration Hospital Historic District, a district listed in the NRHP.
>
> **Type of HP:** 1939-1950 2nd generation hospital and residences.
>
> **Duration of Mitigation:** The Training was held within 6 months of MOA execution, and applicable personnel from surrounding Veterans Integrated Service Network medical centers were invited to attend before then.
>
> **Deliverables and Deadlines:** A Training on Section 106 was held within 6 months of MOA execution.



Figure 4. The Cape Hatteras Lighthouse being relocated in response to encroaching Atlantic Ocean waters. Image courtesy of the National Park Service.

Mitigation Strategies – Abatement

Abatement mitigation strategies, broadly, aim to minimize the effects of construction, demolition, and other development processes to historic places as they are happening.

1. Noise Mitigation

What is Noise Mitigation? Many historic places have existed for decades in the absence of nearby transport corridors, industrial areas, and other sources of noise pollution. If a project will expose a historic place to such noise pollution, this could adversely affect the historic place by changing the surrounding conditions in which it exists. Various forms of Noise Mitigation, including noise-absorbing walls, landscaping with dense vegetation, retrofitting historic structures with noise-reducing materials, implementing speed bumps to calm nearby traffic, rerouting heavy traffic away from historic structures, restricting noisy activities to certain times, and monitoring noise levels, can help mitigate these adverse effects.

Example 1 of when Noise Mitigation was used: Noise Mitigation was used in the Greenville Downtown Intermodal Transportation Center project in Pitt County, ER 09-1371.

Project Description: The Federal Transit Administration planned to construct an Intermodal Transportation Center in Greenville. This construction would adversely affect the Jones-Lee House, a property listed in the NRHP, and the Greenville Art Museum and former Pure Oil Service Station, properties eligible for listing in the NRHP.

Type of HP: 1890-95 Queen Anne/Stick Style 2-story frame house, historic art museum, and c. 1936 1-story side gable brick English Cottage Style gas station.

Duration of Mitigation: Plans for the facility which provide for a landscaped buffer and the routing of bus traffic to reduce noise pollution were completed prior to construction.

Deliverables and Deadlines: A landscaped buffer and bus traffic routing plans were erected and submitted prior to construction. As part of joint consultation under NEPA, the FTA performed a noise and vibration screening following the methodology contained in *Transit Noise and Vibration Impact Assessment.*

Example 2 of when Noise Mitigation was used: Noise Mitigation was used in the Charlotte/Douglas International Airport project in Mecklenburg County, CH 96-0362.

Project Description: The Charlotte/Douglas International Airport planned to obtain permission from the Federal Aviation Administration to change its airport layout plan. These changes would adversely affect the Dr. Richard A. Query House, the John Douglas House, the Asbury House, the Samuel Brown Farm, and the Spatt-Grier Farmhouse and Slave House.

Type of HP: c. 1880 2-story cubic hip roof frame Miscellaneous Victorian house with 2 interior chimneys & hip roof front porch, c. 1867 Greek Revival house, c. 1925 Tudor house, 19th century vernacular I-House, and mid-19th century hall and parlor.

Duration of Mitigation: Plans and specifications for proposed modifications of the historic properties to accommodate sound attenuation were developed prior to construction.

Deliverables and Deadlines: Sound attenuation modifications to the historic properties eligible for the airport's Noise Compatibility Program were developed prior to construction.

2. Vibration Mitigation

What is Vibration Mitigation? As with noise, historic places can be sensitive to newly introduced vibrations. Various forms of Vibration Mitigation, including pre-construction surveys that establish baseline vibration levels, using hydraulic or silent piling methods or other low-vibration construction techniques, using shock-absorbing pavement or other low-noise surface treatments,

restricting heavy-vibration activities to certain times, and monitoring vibration levels can all mitigate adverse effects of vibration on historic places.

Example 1 of when Vibration Mitigation was used: Vibration Mitigation was used in the Perquimans Bridge No. 8 Replacement project in Perquimans County, CH 05-0379.

> **Project Description:** NCDOT planned to use a US Army Corps of Engineers permit to replace Perquimans Bridge No. 8. This replacement would adversely affect Perquimans Bridge No. 8 and the Hertford Historic District, properties listed in the NRHP.
>
> **Type of HP:** Historic bridge and 18th – 20th century courthouse town.
>
> **Duration of Mitigation:** NCDOT's Design-Build Team employed a vibration monitoring firm from NCDOT's list of approved firms to perform pre-construction monitoring before construction and post-construction monitoring after construction.
>
> **Deliverables and Deadlines:** Pre- and post-construction monitoring were performed and SHPO consultations were held if vibration thresholds were exceeded.

Example 2 of when Vibration Mitigation was used: Vibration Mitigation was used in the NC Railroad Second Mainline Track project in Rowan and Cabarrus Counties, ER 10-1472.

> **Project Description:** NCDOT planned to obtain Federal Railroad Administration approval to construct a second mainline track along the NC Railroad right-of-way from Salisbury to Kannapolis. This construction would have an adverse effect on the Lutheran Chapel, RW1407, a property eligible for listing in the NRHP.
>
> **Type of HP:** 1866 brick church, Gothic Revival, 1892 center tower.
>
> **Duration of Mitigation:** On-site research to determine existing vibration levels and assign thresholds were done before construction. Vibration monitoring occurred during construction and for 1 year after construction was completed.
>
> **Deliverables and Deadlines:** Vibration research and threshold assignments were made prior to construction. Vibration monitoring occurred during construction and for 1 year after construction was completed. SHPO consultations were held if vibration thresholds were exceeded.

3. Landscaping

What is Landscaping? While primarily used in transportation projects, Landscaping is a versatile mitigation strategy that uses vegetation to limit the intrusion of visuals, noise, and vibration into a historic place's environment. Trees, shrubs, and other vegetation are selected from approved species lists and are often guaranteed for 2 growing seasons.

Example 1 of when Landscaping was used: Landscaping was used in the Bridge No. 296 Replacement project in Forsyth County, ER 13-2529.

> **Project Description:** The City of Winston-Salem planned to use funding from the Federal Highway Administration to replace Bridge No. 296. This replacement would have an adverse effect on Bridge No. 296, a contributing element within the West Highlands Historic District, a district eligible for listing in the NRHP.
>
> **Type of HP:** 1912 - 1965 residential neighborhood with curvilinear streets.
>
> **Duration of Mitigation:** A post-construction landscaping plan was developed for the affected historic district, to replace to the greatest extent possible the landscaped buffer that would be lost to construction. The plan included replacing crepe myrtles and protecting and retaining the existing magnolia tree and boxwood shrubs. The plan was completed before the completion of construction.
>
> **Deliverables and Deadlines:** A post-construction landscaping plan was submitted before the completion of construction. All new plant materials were warranted for 3 growing seasons and were replaced by the City of Winston-Salem if they failed within that time.

Example 2 of when Landscaping was used: Landscaping was used in the US 401 Widening project in Wake County, GS 92-0092.

> **Project Description:** NCDOT planned to obtain Federal Highway Administration permission to widen US 401 from US 1 to SR 2224. This widening would have an adverse effect on the Alpheus Jones House, the Rufus Ivey House, the Sion Rogers Sr. House, and St. Matthew's Rosenwald School, properties listed in the NRHP.
>
> **Type of HP:** 1847 Greek Revival 2-story frame house, 1872 Italianate brick house, 1848 Greek Revival house, and 1922 frame 2-story Rosenwald School.
>
> **Duration of Mitigation:** A landscaping plan was completed prior to widening.
>
> **Deliverables and Deadlines:** A landscaping plan which included the design and selection of plant materials and specified how each of the historic structures would receive unique landscaping in relation to the median was submitted prior to widening.

4. Salvaging

What is Salvaging? If a historic structure will be demolished, rehabilitated, or relocated, it is common for contractors to set aside historically significant elements of the structure for NC HPO or other relevant stakeholders to remove and store. The goal is for those salvaged items to be in-

corporated into Public Displays or reused in the new structure that will replace the historic structure. Salvaged items may also be used as scrap material, making this mitigation strategy relatively environmentally friendly.

Example 1 of when Salvaging was used: Salvaging was used in the Uptown Revitalization project in Caldwell County, ER 04-1920.

> **Project Description:** The City of Lenoir planned to use US Department of Housing and Urban Development funds to demolish and revitalize buildings. This demolition and revitalization would have an adverse effect on Smithey's Department Store, the Pure Oil Station, and McLean Building, contributing structures within the Lenoir Historic District, a district listed in the NRHP.
>
> **Type of HP:** A historic department store, a historic oil station, and a 1937 1-story brick commercial building with an attached 1957 1-story brick commercial building.
>
> **Duration of Mitigation:** Materials from Smithey's Department Store were salvaged prior to completing demolition.
>
> **Deliverables and Deadlines:** Salvaged materials from Smithey's Department Store were retrieved prior to completing demolition and incorporated into the Public Display.

Example 2 of when Salvaging was used: Salvaging was used in the Young Property Development project in Chatham and Wake Counties, ER 20-1107.

> **Project Description:** Taylor Morrison of NC, Inc., planned to use a US Army Corps of Engineers permit to construct a residential development on the Young Property. This construction would have an adverse effect on the Bartley Yates Farm, a property eligible for listing in the NRHP.
>
> **Type of HP:** 1894 - 1920s farm complex with a 2-story house, a tenant house and an outhouse.
>
> **Duration of Mitigation:** Building materials from the extant outhouses were salvaged prior to completing demolition.
>
> **Deliverables and Deadlines:** Salvaged materials from the extant outhouses were retrieved prior to completing demolition and used to either facilitate the Rehabilitation of the Bartley Yates Farmhouse or as decor on the new property to convey its historic nature.

5. Preservation Plan

What is a Preservation Plan? When consulting parties have not yet finalized the use, layout, and/or design of a planned development, they may call for the creation of a Preservation Plan. A

Preservation Plan gives consulting parties time to assess the effects of the project on the historic resources and coordinate responses to them in advance. Preservation Plans often discuss restoration and treatment measures, ongoing preservation needs, cost estimates, and procedures for consulting with interested parties.

Example 1 of when a Preservation Plan was used: A Preservation Plan was used in the Macon County Airport Extension project in Macon County, ER 91-7484.

> **Project Description:** Macon County Airport planned to acquire permission from the Federal Aviation Administration to change its Airport Layout Plan, involving the extension of a runway, the construction of a runway safety area, and related improvements. These changes would adversely affect an archaeological site that is eligible for listing in the NRHP.
>
> **Type of HP:** Middle Woodland deposits.
>
> **Duration of Mitigation:** The Preservation Plan must be developed prior to any development in the area of the archaeological site.
>
> **Deliverables and Deadlines:** The Preservation Plan included provisions for marking on the Airport Layout Plan that the western portion of the archaeological site was an Environmentally Sensitive Area, and that the airport would consult the EBCI and UKB THPOs before doing any developing of the area near the archaeological site for the life of the MOA.

Example 2 of when a Preservation Plan was used: A Preservation Plan was used in the Falls Lake project in Durham, Granville, and Wake Counties, ER 82-7089.

> **Project Description:** The US Army Corps of Engineers planned to construct the Falls Lake reservoir and dam. This construction would have an adverse effect on the Falls of the Neuse Manufacturing Company and the Mangum House, properties listed in the NRHP, and various archaeological resources and the Bennehan-Cameron Plantation Historic District, properties eligible for listing in the NRHP.
>
> **Type of HP:** An 1854 3-story granite stone paper mill which later became a textile mill, a historic frame house, various archaeological resources, and a historic plantation.
>
> **Duration of Mitigation:** The Preservation Plan was completed before any changes were made to the Mangum House.
>
> **Deliverables and Deadlines:** A Preservation Plan for the Mangum House was made prior to any changes to it.



Figure 5. The John B. and Nancy Strain House prior to rehabilitation.

Mitigation Strategies – Alternative

Alternative mitigation strategies, broadly, aim to mitigate adverse effects in ways not specified above. Legal forms, official documentation, and historic structure treatments are common practices.

1. NCDOT Design

What is NCDOT Design? NCDOT Design refers to the different ways in which NCDOT ensures the continuity of structure appearance when conducting bridge, road, and other transportation projects. This can look like NCDOT consulting local towns on what aesthetic the final design of a structure should have, NCDOT replacing ornamental landscaping, NCDOT constructing a retaining wall that uses simulated masonry, NCDOT using a specific style of guardrails on a bridge, NCDOT putting staging areas in specific locations, and other aesthetic-related actions. The main goal is to prevent developments related to a historic site from looking out of place.

Example 1 of when NCDOT Design was used: NCDOT Design was used in the Asheville I-26 Connector project in Buncombe County, CH 96-0472.

> **Project Description:** The Federal Highway Administration planned to fund NCDOT's I-26 Connector project. This project would adversely affect the Riverside Cemetery, a

contributing element within the NRHP-listed Montford Area Historic District, and an archaeological site.

Type of HP: Late 19th century – early 20th century residential district.

Duration of Mitigation: All designs were implemented during construction and prior to opening the connector to use.

Deliverables and Deadlines: Simulated masonry treatment was performed on the retaining wall, and roadway lighting, parking lots and vehicular circulation routes, and permanent fencing were erected prior to opening the connector to use.

Example 2 of when NCDOT Design was used: NCDOT Design was used in the Tyro School Adaptive Reuse project in Davidson County, ER 08-1509.

Project Description: The NC Housing Foundation planned to use funds from the US Department of Housing and Urban Development to adaptively reuse the former Tyro Elementary School. This adaptive reuse would adversely affect the former Tyro Elementary School, a property eligible for listing in the NRHP.

Type of HP: 1929 1-story Colonial Revival corridor plan brick building.

Duration of Mitigation: Cut sheets for proposed replacement windows were submitted to SHPO prior to demolishing the 5 existing, character-defining arched windows.

Deliverables and Deadlines: Cut sheets for replacement windows were submitted prior to altering the existing windows.

2. Rehabilitation

What is Rehabilitation? Rehabilitation of historic structures allows those structures to retain their significance while accommodating necessary changes for contemporary use. Rehabilitation should follow the 10 Secretary of the Interior Standards for Rehabilitation, which minimize damage to significant features of the historic structure and emphasize that the historic structure should ideally continue to be used for its historic purpose. Rehabilitation is practical when the historic structure is largely intact and when the project does not greatly interfere with its surroundings. When the project does greatly interfere with the historic structure's surroundings, a joint Relocation and Rehabilitation process is sometimes undertaken.

Example 1 of when Rehabilitation was used: Rehabilitation was used in the Savaan Subdivision project in Wake County, ER 17-1498.

Project Description: Ashton Residential, LLC, planned to use a permit from the US Army Corps of Engineers to construct a subdivision in the Savaan Neighborhood in Cary. This construction would have an adverse effect on the NRHP-listed Carpenter Historic

District, because it would require the relocation of a contributing element, the C. F. Ferrell Farmhouse.

Type of HP: Late 19th century – early 20th century farm crossroads district.

Duration of Mitigation: Rehabilitation was completed after relocation and before March 18, 2022.

Deliverables and Deadlines: A Rehabilitation Agreement between the owner of the farmhouse and Capital Area Preservation was signed and recorded within 30 days of MOA execution.

Example 2 of when Rehabilitation was used: Rehabilitation was used in the Leigh Family Cemetery project in Durham County, ER 21-2303.

Project Description: EPCON Farrington Road, LLC, planned to construct a residential facility using one or more federal permits from the US Army Corps of Engineers. This construction would adversely affect the Walter Curtis Hudson Farm and Store, a property listed in the NRHP. Although the project did not directly affect another historic property, Leigh Farm Park, the park was assessed due to its historical connection with the Walter Curtis Hudson Farm and Store. SHPO requested that EPCON contract with a professional associate of the American Institute for Conservation to perform rehabilitation on the above-ground stone grave markers.

Type of HP: 1835 slave dwelling with log chimney.

Duration of Mitigation: Rehabilitation work was completed prior to construction and within 6 months of receipt of written approval from the O. W. Hudson trust, if obtained.

Deliverables and Deadlines: Rehabilitation of grave markers was completed prior to construction and within 6 months of receipt of written approval from the O. W. Hudson trust, if obtained.

3. Relocation

What is Relocation? If a project will greatly interfere with a historic structure's surroundings, and if that historic structure maintains a significant amount of integrity that is partially derived from those surroundings, then moving the historic structure to a new location that is similar to its former surrounding will minimize damage and mitigate adverse effects to that historic structure. Relocation may be used in combination with Rehabilitation, although this is not a requirement, especially if the historic structure is in good condition.

Example 1 of when Relocation was used: Relocation was used in the Tryon Road Widening project in Wake County, ER 03-2973.

> **Project Description:** The City of Raleigh planned to obtain permission from the Federal Highway Administration to widen Tryon Road. This widening would have an adverse effect on the Carolina Pines Hotel, a property eligible for listing in the NRHP.
>
> **Type of HP:** 1933 Colonial Revival 2-story hotel.
>
> **Duration of Mitigation:** Relocation of the hotel's stone wall occurred after the City of Raleigh provided relocation and reconstruction plans to SHPO and before road widening.
>
> **Deliverables and Deadlines:** The historic stone wall was relocated and reconstructed before road widening.

Example 2 of when Relocation was used: Relocation was used in the Carolina Family Health Center Capital Development Grant project in Wilson County, ER 12-1070.

> **Project Description:** Carolina Family Health Centers planned to use US Department of Health and Human Services funds to improve an existing facility in Wilson, requiring the removal of the Wiggins Hadley House. This removal would have an adverse effect on the Wiggins Hadley House, which is a contributing resource to the NRHP-listed Old Wilson Historic District.
>
> **Type of HP:** 1850s – 1920s residential area.
>
> **Duration of Mitigation:** The house was required to be relocated or attempts to relocate it had to have been exhausted prior to December 31, 2013, or after substantial completion of the new building, whichever came later.
>
> **Deliverables and Deadlines:** The house was advertised through Preservation of Wilson and Carolina Family Health Centers provided relocation expenses prior to December 31, 2013, or after substantial completion of the new building, whichever came later.

4. Covenants, Leases, Easements, and Deeds (CLED)

What is CLED? Covenants, Leases, Easements, and Deeds are all legal instruments used to ensure the preservation of, protection of, or mitigation of impacts on, historic properties. Covenants are binding and typically involve commitments by the property owner to maintain the property in accordance with Secretary of the Interior Standards for Rehabilitation. Leases can be used to allow for adaptive reuse or compatible new construction that benefits a historic property while ensuring its preservation. Easements are agreements between a property owner and a preservation organization/government agency that grant the organization/agency certain rights, such as the

right to review and approve any changes to a historic property to ensure its preservation. Deeds convey ownership of a property and can include specific provisions related to historic preservation, such as granting certain rights to a preservation organization.

Example 1 of when CLED was used: CLED was used in the Pilot at Sedgefield Sewer Improvements project in Guilford County, ER 19-1592.

> **Project Description:** The Pilot at Sedgefield planned to use a permit from the US Army Corps of Engineers to conduct onsite sewer improvements. These improvements would adversely affect a historic property on the project site, the Pilot Life Insurance Headquarters Campus, a property individually eligible for listing in the NRHP, and a contributing resource to the NRHP-eligible Sedgefield-Pilot Life Historic District.
>
> **Type of HP:** 1928 3-story building with 2-story wings and surrounding industrialist area.
>
> **Duration of Mitigation:** The owner of the campus had the authority to approve or disapprove all construction within the viewshed during construction or until a Construction Approval Right was transferred to a holder.
>
> **Deliverables and Deadlines:** A Viewshed Easement was completed and succeeded by a Construction Approval Right, the latter of which was transferred to a holder before the date of the campus' listing on the NRHP or the expiration of the US Army Corps of Engineers permit, whichever came first.

Example 2 of when CLED was used: CLED was used in x, ER 04-1502.

> **Project Description:** The Federal Emergency Management Agency planned to use Pre-Disaster Mitigation Competitive Grant Program funds to acquire and demolish the former Marshall High School. This demolition would adversely affect the Marshall High School, a property eligible for listing in the NRHP.
>
> **Type of HP:** 1926 2-story brick public school.
>
> **Duration of Mitigation:** The restrictive covenants dedicated and maintained the entire school site in perpetuity.
>
> **Deliverables and Deadlines:** Permanent restrictive covenants dedicated and maintained the entire former school site for use as an open greenspace.

5. NRHP/Study List Nominations

What is an NRHP/Study List Nomination? To be protected by Section 106, a historic place must be either listed in or determined eligible for listing in the NRHP. If a given project has the potential to adversely affect a place determined eligible for listing in the NRHP, that place may

be nominated for full listing in the NRHP. Nominating a place for listing in the NRHP requires historical research, photography, maps, and an understanding that if a specific characteristic of a place is not included in its NRHP nomination, then it does not get much protection from development. Because of this, it is ideal for someone who already has experience with NRHP Nomination forms to be contracted.

Example 1 of when an NRHP/Study List Nomination was used: An NRHP Nomination was used in the Old Cherry Redevelopment project in Forsyth County, ER 01-7818.

> **Project Description:** The City of Winston-Salem planned to use US Department of Housing and Urban Development funds to build infill-housing and demolish several housing units on vacant lots in the Old Cherry neighborhood. This construction would adversely affect the North Cherry Historic District, which is listed in the NRHP.
>
> **Type of HP:** 1924 – 1954 residential area.
>
> **Duration of Mitigation:** The historic district was re-evaluated for listing in the NRHP and its NRHP Nomination form was amended between when the project was completed and before January 2012.
>
> **Deliverables and Deadlines:** Amended NRHP Nomination form was submitted between when the project was completed and before January 2012.

Example 2 of when an NRHP/Study List Nomination was used: An NRHP Nomination was used in the Leesville Road Market Place project in Wake County, ER 16-1664.

> **Project Description:** Halpern Enterprises, Inc. planned to use a US Army Corps of Engineers permit to construct the Leesville Road Market Place. This construction would adversely affect the NRHP-eligible Leesville Road Teacherage, which would be relocated from the project site to allow for construction.
>
> **Type of HP:** Historic teacherage.
>
> **Duration of Mitigation:** A State Study List application for the teacherage was completed after the teacherage was relocated and within 24 months of the relocation.
>
> **Deliverables and Deadlines:** A State Study List application was completed by an architectural historian hired by Halpern Enterprises within 24 months of teacherage relocation.

6. Mothballing/Stabilization

What is Mothballing? Mothballing involves stabilizing and protecting a historic property from deterioration without actively using it. Mothballing protects vacant historic properties from van-

dalism, theft, and weather-related damage, and allows time for consulting parties to secure funding, conduct necessary studies, and/or develop plans for the property's future use or restoration. Because of this, mothballing is a practical strategy when immediate resources for full-scale restoration or adaptive reuse are not available.

Example 1 of when Mothballing was used: Mothballing was used in the Pioneer Mills-Cedarvale Subdivision project in Cabarrus County, ER 06-0408.

> **Project Description:** Pioneer Mill, LLP planned to use a US Army Corps of Engineers permit to construct the Pioneer Mills-Cedarvale Subdivision. This construction would adversely affect the NRHP-listed Robert H. Morrison Farm and Pioneer Mills Gold Mine Historic District by requiring the demolition or removal of several of its contributing historic buildings and structures. SHPO requested that four contributing buildings to the historic district, the Robert H. Morrison House, the Post Office, the Smokehouse, and the Log Barn, not be demolished or removed, and instead be used to form the core of a future amenity center.
>
> **Type of HP:** Mid-19th century Greek Revival 2-story frame house and gold mine.
>
> **Duration of Mitigation:** The buildings that formed the amenity center were mothballed per Secretary of the Interior Standards prior to beginning construction.
>
> **Deliverables and Deadlines:** The historic buildings were mothballed for an unspecified amount of time.

Example 2 of when Mothballing was used: Mothballing was used in the Hamptons Residential Development project in Chatham County, ER 06-1311.

> **Project Description:** Windjam 23, LLC planned to use a US Army Corps of Engineers permit to construct a residential development known as the Hamptons. This construction would adversely affect the NRHP-listed Dr. E. H. Ward Farm.
>
> **Type of HP:** 1870 1-story frame house with older outbuildings.
>
> **Duration of Mitigation:** The farm's homesite was required to be maintained and in "show condition" for the duration of its marketing period and be occupied until January 15, 2007. If the homesite was not under contract and occupied within 18 months of January 15, 2007, all of the historic buildings within the homesite were to be mothballed per Secretary of the Interior Standards.
>
> **Deliverables and Deadlines:** The structures were mothballed after January 15, 2007, if no new owner was found.

7. Study

What is a Study? Similar in purpose to both Preservation Plans and Mothballing, Studies are conducted when consulting parties are unsure if it is feasible to perform a given mitigation strategy on a historic property. Activities can include historic research, cost-benefit analyses, structure stability testing, and other measures to ensure that the potential mitigation strategy can be carried out successfully.

Example 1 of when a Study was used: A Study was used in the Fayetteville Veterans Affairs Medical Center Community Living Center project in Cumberland County, ER 14-0003.

> **Project Description:** The Fayetteville Veterans Affairs Medical Center, a part of the US Department of Veterans Affairs, planned to construct a stand-alone community living center at its existing location as described in the report "Replacement of Community Living Centers Historical Impact". This construction would the demolition of contributing structures to the NRHP-listed Fayetteville Veterans Administration Hospital Historic District.
>
> **Type of HP:** 1939 – 1950 2nd generation hospital and residences.
>
> **Duration of Mitigation:** The study on whether the contributing structures could be adaptively reused was completed within 30 months of MOA execution and was submitted to SHPO and the ACHP for review.
>
> **Deliverables and Deadlines:** The adaptive use study was completed within 30 months of MOA execution, and the Fayetteville Veterans Affairs Medical Center initiated Section 106 consultation with SHPO before making decisions about ways to proceed based on the results of the study.

Closing Remarks

We hope that you have found this resource to be helpful and informative. We would love to hear your ideas for mitigation strategies, especially those that address specific needs within your community. If you have questions about historic preservation, Section 106 regulatory compliance, or historic property mitigation strategies, please contact us at Environmental.Review@dncr.nc.gov or visit our website at https://www.hpo.nc.gov/ to view the current Environmental Review staff contact list.