Carson-Steel Barn

Historic Structure Report

Hopewell Culture National
Historical Park
Chillicothe, Ohio



FEBRUARY 28, 2025
NPS PMIS 314612

Cover Image:
Scribe Rule Barn, East and Partial North Elevation
(STRATA 2023)

Carson-Steel Barn
HISTORIC STRUCTURE REPORT
Hopewell Culture National Historical Park

Chillicothe, Ohio

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January 31, 2025

NPS PMIS 314612

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Carson-Steel Barn, looking west. (STRATA 2023)

1 INTRODUCTION AND SUMMARY

Chapter 1 – Introduction and Summary



Figure 1.1 View of the Scribe Rule Barn from the trail, looking southwest. (STRATA 2023)

Overview

The Carson-Steel Barn property is part of the Hopewell Mound Group in the Hopewell Culture National Historical Park, a unit of the National Park Service, and a UNESCO World Heritage Site (Figure 1.1). The barn is located within the Great Enclosure of the Hopewell Mound Group, one of six archaeological earthwork complexes in the Historical Park. It is a heavy-timber framed building constructed ca. 1831 for William Carson and enlarged to its current form for Johanna Steel ca. 1868.[1] It was part of an active Ross County, Ohio, farm for almost two centuries. The barn is architecturally significant for its heavy timber framing, which features characteristics of two methods used at the time: Scribe Rule and Square Rule framing.

Project Purpose and Need

The Historic Structure Report (HSR) has been prepared to investigate and document the historical context, construction chronology, and current conditions and to develop treatment

[1] Construction dates for the two sections have been determined via testing of the structural members by an expert in dendrochronology. The testing showed that the trees used for the Carson-Steel Barn were harvested in 1828,1829 and 1830 (for the core) and 1868 (for the additions). Therefore, it is likely the different sections of the barn were built within a year of the latest respective tree harvests. See Nick Wiesenberg, “Dendrochronological Dating of the Hopewell Culture National Historic Park Barn in Chillicothe, Ohio,” (Wooster, OH: College of Wooster Tree Ring Lab, 2023).

recommendations for the historic Carson-Steel Barn. The HSR will be used by the National Park Service (park and Region) to inform and guide the historic barn's short- and long-term stewardship.

The HSR scope of work outlined by the NPS includes:

- Research and Identify the Historical Background and Context
- Record and Depict Graphically the Chronology of Development and Use
- Identify the Character-Defining Features and Provide a Physical Description
- Document the Structure and Site
- Provide Condition Assessment of the Site, Architectural and Structural Building Condition, and Applicable Systems
- Provide a Treatment Plan, Including an Ultimate Preferred Treatment and Costs
- Establish Historic Significance - Provide a Determination of Eligibility and National Register Nomination (DOE Completed)
- List the Carson-Steel Barn in the National Register of Historic Places, if appropriate.

Once the research, documentation, and assessment were completed, the park and Region worked with the HSR team to determine the park operation needs, visitor benefits, and treatment options. In the past, the barn has been largely viewed as an intrusion on the cultural landscape. However, based on recent tribal consultation and a more expansive historical viewpoint, it has emerged that the two resources (the barn and the Great Enclosure of the Hopewell Mound Group) may not be incompatible. The barn could potentially serve as a tangible link to the impacts of Euro-American settler-colonialism in the Northwest Territory and its particular impacts on American Indian heritage sites. Interpretive themes related to the structure may improve public understanding of the site's layered history.

Summary of Findings and Recommendations

Findings

- Dendrochronology conducted in late 2023 revealed that the barn was built slightly later than first believed; the core was built ca. 1831, and the addition was constructed ca. 1868.
- An eligibility assessment submitted to the Ohio SHPO yielded an official opinion that the barn is potentially eligible to be listed in the National Register of Historic Places for architectural significance.
- The overall condition of the barn is fair to poor, with a large section in the SW corner of the original ca. 1831 structure in a state of potential collapse and portions of the ca. 1868 south and west bays with open roof damage, resulting in accelerated water infiltration and deterioration of the historic wood-framed structure.
- The ca. 1831 timber frame is in relatively fair to poor condition along the east, south, and north sides, with most of the deterioration focused on the NW, west, and SW portions of the timber framing and framing members in contact with grade. A majority of the west

wall is in a state of imminent collapse. The SW post has failed. The NW post has buckled and will likely soon fail. Horizontal framing into the posts has failed. The south sill beam and west side of the interior sill beam that supports the interior floor structure have deteriorated. Siding and wood framing contact with grade and significant water infiltration through the barn roof and walls will further the barn's deterioration.

- The ca. 1868 U-shaped addition on the south, west, and north sides is in fair to poor condition. The south and west bays have suffered significant losses and failures from the 2020 storm damage. Portions of the timber frame structure, board walls, roofing framing, and metal roofing have collapsed or are missing, and the adjacent structure appears to be in imminent danger of collapse.

Preferred Treatment Recommendation - Demolition

Considering the historical research and existing conditions assessment, the HSR team developed seven treatment alternatives, which were considered during a one-day Treatment Workshop with the park, Region, and the Ohio State Historic Preservation Office. The workshop explored the barn's history, existing conditions, potential long-term uses, interpretive options, the park's mission and available resources, and how various treatments would impact the overall integrity of the barn and the UNESCO World Heritage site.

Architectural and structural investigations of the historic barn revealed extensive deterioration of the historic timber framing, some of which is not readily visible. As a result of storm damage and water infiltration, pest damage, wood in contact with grade, and general deterioration due to the age of building components (such as the siding and roof), the barn requires significant intervention for stabilization. This complex rehabilitation effort would require complete disassembly and reconstruction of the barn's timber frame to make the necessary repairs. Work would include carefully dismantling each mortise and tenon joint to replace deteriorated or damaged members. Likely, nearly 70% of the overall barn framing and other building components (roof sheathing and all siding) would require replacement in kind. While preserving the barn's historic ca. 1831 Scribe Rule timber frame structure and the ca. 1868 addition would be the primary goal of a preservation or rehabilitation project, the Workshop attendees agreed that the complexity and significant costs associated with the rehabilitation of the structure with no practical long-term use outweighed the costs for the efforts. Concerns also included whether the barn would retain historic integrity once the deteriorated framing and cladding components were replaced.

The decision to demolish the Carson-Steel Barn was thoughtfully considered, with the desire to define the demolition process to protect the potential earthwork remnants and below-grade archeological resources while providing an avenue for a timber framing contractor to salvage historic timbers for either future reconstruction or reuse on a new site. The HSR team has provided recommendations for potential further study and consideration related to the barn's demolition, a draft scope of work, a draft PMIS project statement, and draft project specifications for the National Park Service to use to solicit the demolition contract.

The documentation of the Treatment Workshop and recommendations can be found in Chapter 4 of this report. The draft project specifications for the demolition have been submitted as a separate deliverable in tandem with this report.

Administrative Data

Location:
4100 Block of Sulphur Lick Road, Chillicothe, Union Township, Ross County, Ohio
Latitude 39.358062° AKA 39°21'29.02"N; Longitude -83.096462° AKA 83° 5'47.26"W
Ross County Real Estate Parcel #370920140000

NPS Parcel No. 120-05.
Virginia Military Survey (VMS) Tract 2531. (VMS Tract 8717 was also part of the farm.)

Feature Identification Number 129232
(One number assigned to this and two other barns, per a ca. 2009 CLI.)

The Hopewell Culture National Historical Park was established in 1992, with the Hopewell Mound Group added in 1997.

The National Park Service acquired the parcel of land that houses the Carson-Steel Barn in 2003.

The park's 2014 Foundation Document[2] includes the following information to consider when evaluating the treatment of the Carson-Steel Barn project:

> Park Purpose:
> Preserve, interpret, and research the archeological record of a distinctive and influential American Indian culture known today as Hopewell, including earthworks, artifacts, other archeological resources, the cultural landscape, and ethnographic information.
>
> Fundamental Resources and Values - These are identified to provide guidance for the NPS to ensure the conservation and public enjoyment of these qualities that are essential to achieving the purpose of the park and maintaining its significance. If these resources are allowed to deteriorate, the park's purpose and/or significance could be jeopardized. The relevant resources at the Hopewell Mound Group include:
>
> - Mounds and Earthworks. Earthen architecture, including ditches, borrow pits, postholes, and other associated features, which may be subsurface and invisible to the visitor.

[2] Foundation document: Hopewell Culture National Historical Park, Ohio. National Park Service, June 2017.

- Archeological Resources Beyond the Mounds. Nonmound archeological resources related to daily life and work of precontact American Indian people, including remains of habitation sites, workshops, ritual architecture, and other activity areas. These may be related to periods of occupation before, during, or after the Hopewell period.
- Value of the Park as a Place Sacred to American Indians and Others; a Place that Fosters the Opportunity for Personal Reflection.

The barn is currently considered to be an intrusion on the fundamental archaeological resources.

Other Important Resources and Values – These are resources of values not fundamental to the purpose of the park but are important to consider that are relevant to this study:

- The Natural Landscape Within Which the Earthworks Are Situated.
- National Register of Historic Places Listed or Eligible Sites. The Carson-Steel Barn may currently be eligible for listing; however, there are concerns the barn would not be eligible due to lack of integrity/authenticity after a complex rehabilitation, which may replace a majority of the critical framing and other building components.
- Other Historic Resources. Resources that are a tangible part of the past play an important role in understanding the history, context, and alteration of the park's fundamental Hopewell archeological resources.
- Tri-County Triangle Trail Section (Paint Creek Recreational Trail). A section of a multiuse recreational trail that passes through the Hopewell Mound Group, just north of the barn. This trail is part of a 32-mile trail between communities and attracts users who might not otherwise visit the park.

The park hopes that visitors will learn the comprehensive park story and become more interested in the culture. Visitors may experience park resources by walking around the sites, viewing them from an overlook, hiking an interpretive trail, reading waysides and brochures, joining an interpretive program, seeing outlined or partially restored earthworks, watching interpretive demonstrations, and imagining what the original sites looked like.

Based on the revised 2022 General Management Plan Management[3] Zone Map, the Carson-Steel Barn is located within the 'Development' Zone and close to the 'Pedestrian' Zone of the Great Enclosure of the Hopewell Mound Group. The pedestrian zone includes opportunities for pedestrians to enjoy the trails, take guided tours, view kiosks, wayside exhibits, signage, and the earthworks while protecting the historic resources. Near the park unit's eastern boundary, visitor services include restrooms and some site-specific interpretive information to serve as visitor orientation to the site. Overlooks on the north terrace edge trails offer a unique view of the site and the barn.

[3] General Management Plan: Hopewell Culture National Historical Park, Ohio. National Park Service, April 1997.

NPS Facility Management Information

FMSS Location Number: 112273
Asset Priority Index (API) – 0

The Asset Priority Index (API) is a measure of an asset's importance to the National Park Service mission and the mission of the park in which it resides. It measures how closely each of a park's assets is aligned with mission goals. Determining this score helps parks decide which assets should be retained and at what level they should be maintained.

The API rating is determined by an interdisciplinary team using the five criteria described in the table below, and it is calculated out of 100 possible points.

The '0' API for the Carson Steel Barn reflects that the asset is not a fundamental cultural resource of the park, does not support park operations, and has no functional use or purpose.

API Criteria	Definition
1. Natural Resource Preservation	Directly contributes to a park's ability to preserve natural resource processes, systems, and values in an unimpaired condition through understanding, maintenance, restoration, and protection of their inherent integrity.
2. Cultural Resource Preservation	Is a cultural resource or is an asset that enhances a park's ability to preserve and protect its cultural resources.
3. Visitor Use	Contributes to "visitor accessibility, understanding and enjoyment" as measured by: • The potential number of visitors who may use the asset • That asset's role in creating a positive experience for the visitor, which includes education and recreation.
4. Park Operations	Directly supports the day-to-day operations of a park, park management, contracts/agreements, safety, security, and emergency response OR supports employees' ability to perform park operations.
5. Asset Substitutability	Represents the degree to which a comparable, substitute asset exists to fulfill the functional requirements or purpose of an asset. One would ask this question to determine asset substitutability: if the asset were lost, what would be the impact?

Figure 1.2. NPS API Criteria and Definitions Table.

Report and Chapter Organization

The Historic Structure Report is organized and formatted to follow the recommended outline by compiling the report into two sections with a brief introduction and overview.

- The report's first section (Part 1: Developmental History) focuses on the research and history of the barn and the surrounding context, outlines the evolution of the property and building through episodes, and describes the existing conditions of the barn and property.
- The report's second section (Part 2: Treatment and Use) considers the barn's developmental history and existing conditions and documents the process of determining a long-term treatment approach for the barn structure. The preferred treatment was based on a Treatment Workshop held with the park and Region in June 2024. Appendices provide support documents.



Figure 1.3. Aerial view of the Scribe Rule Barn at the southern perimeter of the Hopewell Mound Group. (Ross County Auditor Parcel Viewer / STRATA 2024)

Setting and Study Area Description

The barn occupies an open, level site on the Circleville Terrace within and near the southern portion of the Great Enclosure of the Hopewell Mound Group. It is roughly 180 feet south of Sulphur Lick Road. The Paint Creek Recreation Trail, which occupies the former B & O Railroad right of way, runs between the barn and the road, near the south side of the road. The barn is surrounded by mowed grass fields on three sides, with a tree line close to its south wall. The tree line follows the south edge of the Great Enclosure at the edge of the Circleville Terrace, a short hillside that slopes down to the floodplain of the North Fork of Paint Creek. The floodplain

contains an agricultural field. There is a modern (ca. 1990s) house approximately 300 feet east of the barn; it replaced an older house between 1984 and 1995.[4] When new, the barn was part of a 250-acre farm.

Project North—Cardinal Orientation

The Carson-Steel Barn is oriented at an approximate 6° skew west from true north. For clarity and ease of orthogonal drawing, Project North shall be considered offset 6° west of true north. The east elevation features the gable of the original structure and the main entries and shall, therefore, be regarded as the primary façade.

Statement of Significance and Historical Overview

Owners of the Carson-Steel Barn Property: 1796-2024	
Nathaniel Massie	1796-1798
Joseph Darlington	1798-1814
Jeremiah Ashby	1814-1829
William Carson	1829-1833
William C. Clark	1833-1848
Johanna Steel (nee Clark)	1848-1888
Mordecai Cloud Hopewell and Ella R. Hopewell	1889-1938
Accord Family	1938-1967
Richard P. and Betsy Johnson	1967-1976
Ray Family	1976-2003
The National Park Service	2003-2024

Figure 1.4. Chain of Ownership for the Carson-Steel Barn Property. Compiled from Ross County Deed Records.

Summary Statement of Significance

The Carson-Steel Barn in Union Township, Ross County, Ohio, is architecturally significant. Built just a few decades after Ohio became a state, it features distinctive characteristics of two different methods of heavy timber framing used at the time. The barn framing is a good example of both Scribe Rule and Square Rule timber framing. The Scribe Rule method of timber framing, which required the services of at least one master carpenter, developed in England and Europe in the 1200s and was used in the American colonies and the United States into the first half of the 1800s. The less technical Square Rule method developed in the United States around 1800, and by the mid-1800s, it had almost wholly replaced Scribe Rule. The Carson-Steel Barn was built during that transitional period, providing a good example of both framing techniques. Most of the connections in the original part of the barn, constructed ca. 1831, utilize Scribe Rule

[4] 1984 and 1995 aerial photos, on *Vintage Aerial*, accessed February 20, 2024.

joinery, identified by distinctive marriage marks and tight-fitting joints, while the tops of the corner posts appear to have been constructed with Square Rule joinery: this combination shows that the builder or builders were aware of the technological changes that were underway at the time. When the barn was expanded to its current form, ca. 1868, the builders used the Square Rule method. The combination of those distinctive construction techniques in the Carson-Steel Barn reflects the evolution of timber framing practices that were common in the first half of the 19th century, before the development of dimensional lumber.

Period of Significance

The period of significance begins ca. 1831, with the construction of the first section, and ends ca. 1868 when the addition was complete.

Episodes

The barn's history has been divided into episodes based on physical changes to the building and major changes in ownership.

Episode 1. Construction of the Original Barn: ca. 1829 - 1867
William Carson bought the property and had the barn built ca. 1831. The new barn was assembled using the Scribe Rule method of timber framing. In 1833, it was sold to William C. Clark, who farmed the 250-acre farm until his death in 1848. Clark's wife and daughters kept the property after his death, and it remained an active farm. George Steel, husband of Clark's oldest daughter Johanna, appears to have managed the farm for part of this period.

Episode 2. Joanna Steel and Barn Expansion: 1868 - 1888
Joanna Steel took over the farm operation after her husband died. One of her first tasks was to oversee the expansion of the Carson barn to increase functionality and potentially accommodate a variety of uses. The addition to the barn, which quadrupled its size, utilizes Square Rule timber framing. Johanna Steel owned and operated the farm until her death in 1888.

Episode 3. M. C. Hopewell, Archeological Investigations, and Continued Agricultural Use: 1889 - 1973
M. C. Hopewell bought the property from the Steel estate and farmed it with the help of tenant farmers. From 1891 to early 1892, Warren K. Moorehead led excavations of the mound group in anticipation of the 1893 World's Columbian Exposition. As was common practice at the time, he changed the complex's name to the Hopewell Mound Group, reflecting the land's ownership at the time of his excavations. The barn and 250-acre farm saw no major functional changes during this period.

Episode 4. National Park Development: 1974 - Present
The Hopewell Mound Group was listed in the National Register of Historic Places in 1974 for archeological significance. Public and semi-public organizations began

purchasing land in the Hopewell Mound Group to ensure its preservation. In 1992, the Hopewell Culture National Historical Park was established, and in 2003, the National Park Service acquired the additional parcel of land that houses the Carson-Steel Barn. The barn has been used only for light storage since that time.

Character Defining Features:

- Heavy timber frame of original ca. 1831 barn and ca. 1868 addition.
- V-joint tongue and groove siding (likely from outside of the POS).
- Waist/waste walls and wood flooring.
- Roofline and general form of the building. The date of the metal roofing is unknown, but it may be original to 1868 or later.

Investigation Methodology and Review Standards

This report is based on a combination of field study, data analysis, and archival research conducted by a multi-disciplinary team. The work was guided by *Preservation Brief #43: The Preparation and Use of Historic Structure Reports* and *Historic Structure Reports and Preservation Plans: A Preparation Guide*.[5] Recommendations for the treatment workshop and within the report have been developed to comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties.
Historical research for the project included in-person and online consultation with a variety of primary and secondary sources. The HSR Team engaged several specialty consultants in the analysis of the existing field conditions and to understand the construction technology of scribe rule timber framing and barn raising.

- Rudy Christian, owner of Christian & Son, Inc., an Ohio-based timber framing company with experience in restoring, salvaging, and reconstructing historic timber frame barns, was consulted. Mr. Christian had previously provided an assessment of the barn in 2014. He offered insight into 19th-century building technologies, barn raising, and descriptions of scribe rule framing and the transition to square rule framing.
- Raymond Friend, owner of The Barn & Cabin Friend, a Southern Ohio-based contractor specializing in repairing, rebuilding, and salvaging barns and other historic buildings, was also consulted. Mr. Friend visited the Scribe Rule site during the AE Team assessment site visit. During this assessment, he participated in the review of the structure and provided an hour-long workshop to the park staff on the tools and

[5] Deborah Slaton, *Preservation Brief 43: The Preparation and Use of Historic Structure Reports* (Washington, D.C.: National Park Service, 2005); Dominique M. Hawkins and Lyssa Papazian, *Historic Structure Reports & Preservation Plans: A Preparation Guide* (Trenton, NJ: New Jersey Preservation Office, 2015).

construction methodologies of felling logs and construction barns utilizing the Scribe Rule method.

- Nick Wiesenberg from The College of Wooster Tree Ring Lab, Department of Earth Sciences in Wooster, Ohio, visited the barn during the AE site visit and participated in the hour-long workshop with Mr. Friend to discuss procuring trees and construction techniques used in early timber framing. During the site visit, he took twelve core samples for dendrochronological dating to assist the AE Team in understanding the potential construction dates for the two barn sections.

RCMonkeys performed a 2-day site visit to scan the barn to provide a Revit model and Matterport 3D photographic documentation. A multi-day site visit included STRATA architects and a Silman structural engineer. Work included measuring the structure, verifying construction details, and photographing with a digital camera and a 360º camera. The site visit also included a one-hour workshop on scribe rule framing techniques by timber frame contractor Raymond Friend of The Barn & Cabin Friend company and a site visit by Nick Wiesenberg of The College of Wooster Tree Ring Lab, who performed dendrochronological testing of the wood framing.

Limited access to portions of the barn was necessary due to the current unstable condition of the framing in the south and west portions of the barn structure.

Project Team Members

The Project Team for this Historic Structures Report included the following:

Hopewell Culture National Historical Park
Park staff assisted in directing research and site access, provided local knowledge, and provided resources needed for the barn assessment.

- Chris Alford, Superintendent
- Dr. Bret Ruby, Archeologist and Project Manager
- Dr. Timothy Everhart, Cultural Resource Program Manager
- Leslie "Drew" Long, Maintenance Worker Supervisor

National Park Service Regional Office
The Carson Steel Barn HSR project was led by John Rosemurgy, Historical Architect and Contracting Officer Representative (COR) for the project, and supported by Nicholas Murray, Contracting Officer. Treatment Workshop attendees included Ronald Cockrell, Regional Historian and Park History Program Manager, and Kevin Schluckebier, Regional Chief of Design and Construction. Suika Rivett, Section 106 Coordinator for the Region, assisted with developing Section 106 procedures related to the barn's demolition.

Project Management and Historical Architect
STRATA Architecture Inc. (STRATA), Kansas City, Missouri
Angie Gaebler, AIA, was the principal Historical Architect and Project Team Manager, assisted by Zevi Aronstein, Historical Architectural Designer. Together, they conducted initial research and the building assessment, recorded existing conditions, and developed the Historic Structure Report with historians, structural engineering consultants, and park archeologists.

Architectural Historian
Building Preservation (BP), Columbia, Missouri
Debbie Sheals of BP, assisted by Josh Amelunke, provided historical research of the barn, site, and context. They utilized historic maps and surveys, deeds, chain of title, probate records, dendrochronology, and numerous primary and secondary sources to determine likely builders of the barn, understand its context, and develop the barn's episodic history. Sheals also provided the Determination of Eligibility (DOE) and consulted on Section 106 procedures for the barn's demolition.

Structural Engineer
Silman Associates, Ann Arbor, Michigan
Jenna Bresler, PE, of Silman Associates, provided a structural assessment of the existing barn structure and treatment recommendations to address immediate-, short-, and long-term concerns with the structure.

3D-Scanning & BIM Consultant
RCMonkeys, Atlanta, Georgia
Silviu Stoian and Bryan Hallinan from RCMonkeys 3D laser scanned the exterior and interior of the existing structure. They created the base Revit model for representational and diagrammatic use in the report. They also provided photographic 360° Matterport documentation of the existing conditions.

Dendrochronology Consultant
The College of Wooster Tree Ring Lab (WTRL), Wooster, Ohio
Nick Wiesenberg, with the WTRL, contributed onsite testing and dendrochronological dating of a wide range of samples from the barn. He also provided some additional expertise in historic vernacular construction.

Acknowledgments

Dr. Bret Ruby, Archeologist and Project Manager, HOCU
Dr. Bret Ruby has provided the team with the leadership and support to complete the assessment and research for this project to date. His vision for the potential of the Carson-Steel Barn has been influential in considering the history and possibility for the historic structure. Dr. Ruby retired before the finalization of the HSR but was a crucial part of the historic Treatment Workshop to determine the preferred long-term treatment recommendation.

Dr. Timothy Everhart, Cultural Resource Program Manager, HOCU
Dr. Timothy Everhart kindly shared his research on the Ashby family and other early property history. This includes the oldest known map of the property, made in 1818, that he discovered in Ross County records in 2022. He assumed the leadership to finalize the HSR Report and directed the final treatment guidelines with Region.

Raymond Friend, The Barn and Cabin Friend, Leesburg, Ohio
Raymond Friend contributed his expertise in vernacular timber framing in an analysis of the Carson-Steel Barn and provided a timber framing workshop to the Project Team and park, including explanations of the different types of timber frame construction and a brief demonstration of the traditional tools of the trade.

Rudy Christian, Christian & Son, Inc.
Rudy Christian provided valuable insight into the history of timber framing practices in the region and the value of this barn as a unique example of these traditions. The HSR Team utilized this 2014 report on this barn as a starting point for their research and study of the barn.

Recommendations for Future Research and Investigation

1. Consider producing an interpretive plan specific to the Carson Steel Barn site, which may incorporate the overall farmstead (house, outbuildings, site circulation, overall farmland, and use) as well as identifying how the farmstead overlaps with the Hopewell Mound Group Great Enclosure site features.
    a. Search Ross County Engineer Books (Fairgrounds Road Office) for surveys of the Ashby and Steel farms. Deed records include reference to work by the following surveys, which were not at the County Recorder's Office or the Ross County Historical Society:
        Jesse(?) Wiley He surveyed a parcel of Jeremiah Ashby's land for Jeremiah or Daniel Ashby, ca. 1828 per Deed Book 24, p. 94.
        W. E. Stone (C. E.) (county engineer?) surveyed 256.9 acres of the Steel farm in 1879. See Ross County Deed Records, Book 256, p 369, James and Rose Acord to Clyde, James, and Clarence Acord.
    b. Learn more about early tenant farmers. Associated records may include early images of the barn and information about how it functioned.
    c. Research Ohio barns of comparable age to identify more examples of Scribe Rule construction.
2. Consider non-destructive subsurface exploration to determine the actual location of the southern portion of the Great Enclosure wall as it relates to the barn site.
3. If the roof is replaced in the future, or if the barn is dismantled, inspect the top side of the ca. 1831 pole rafters for additional nail holes to indicate the spacing of the original skip sheathing. A similar investigation for the siding should be conducted. The nailing patterns will be more evident when the siding is removed for repairs or dismantling.



Photo of the Carson-Steel Barn taken 1922. (Ohio History Connection.)

2 HISTORICAL BACKGROUND AND CONTEXT

Chapter 2.0 - Introduction

Chapter Two documents the history of the Carson-Steel Barn and related farmland, with an emphasis on the span of years in which the building came to its current form. The first section of the barn was built ca. 1831, and additions brought it to its current form ca. 1868. Those events define the period of significance for the building, which begins in ca. 1831 and ends in 1868. The following discussion divides the historical development of the property into episodes that are based upon physical modifications and significant changes in ownership.

An overview of land use before the barn was built is followed by Episodes I and II, which encompass the major construction periods. The core was built for merchant William Carson, and the addition was made for Joanna C. Steel, one of the few recognized female farmers in the township in the mid to late 1800s. The barn and property continued to serve an agricultural function through Episode 3, which ended with growing interest in the creation of a National Park to interpret and protect the ancient earthworks of the region. The final episode includes the transition from privately owned farmland to part of a National Historical Park and, as of 2023, a World Heritage Site.

Section 2.2 provides context for the architecture of nineteenth-century barns in general, and the Carson-Steel Barn in particular. That includes a brief history of how timber-framed barns of the era were built and an overview of the distinctive framing methods used on this barn, including Scribe Rule framing. Common barn types of the time are also identified and compared to the Carson-Steel Barn, which has an unusual and possibly unique form. A study group of comparable barns includes local barns built during the period of significance for the Carson-Steel Barn, plus other Scribe Rule barns listed in the National Register of Historic Places. Finally, the chapter ends with a quick reference timeline of important historical events (Section 2.3).

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2.1 - Chronology of Development and Use

Preconstruction: Precontact and Early White Settlement

When the glaciers receded over 14,000 years ago, the area now known as Ohio was occupied by Indigenous people who made their subsistence through hunting, gathering, and fishing. During the Archaic period (9000 BCE -1000 BCE), advances in small-scale agriculture helped spur more permanent settlements.[6] That trend continued into the Early Woodland Period (ca. 1000 BCE to 500 CE), with larger settlements and the development of long-distance trade routes. The Scioto-Paint Creek region was home to the Adena culture during the Early Woodland period.[7] The Adena buried their dead with goods like copper and shells in earthen mounds that were expanded as burials were added. They were succeeded by the Hopewell culture, which was active from around 1- 400 CE during the Middle Woodland Period.[8]

The true names of the Hopewell and many other early cultures have not been determined. Following standard practice in the late nineteenth century, the Adena and Hopewell cultures were named for the property owners of sites that were archetypical of broader archaeological cultures. The Hopewell culture is named for Mordecai Cloud Hopewell, a prominent citizen of Chillicothe who owned most of what is now known as the Hopewell Mound Group from 1889 to 1903. As one National Park Service bulletin noted, “Consequently, a remarkable American Indian culture, which is believed to have stretched from the Great Lakes to the Gulf of Mexico, is named after an otherwise obscure Chillicothe landowner.”[9] The Carson-Steel Barn is also located on M. C. Hopewell’s former farm.

Hopewell earthworks were extensive compared to those of the Adena. Hopewell earthwork complexes have been identified in 42 sites in southern and central Ohio, including the Hopewell Mound Group. Hopewell ceremonial landscapes were constructed of earthen mounds, stone walls, and earthen and timber-pole enclosures, some of which are aligned astronomically. The Hopewell Mound Group was built with walls that are estimated to have originally been 35 feet wide at the base, enclosing 111 acres. A 16-acre square enclosure adjoins the east wall of what is sometimes referred to as the Great Enclosure. When new, the Great Enclosure contained a circular earthwork and a D-shaped earthwork. The D-shaped enclosure holds the remains of the largest mound found in the Hopewell culture area.[10] (As is the case at many Hopewell sites, decades of agriculture use and other activities have greatly eroded those earthworks.)

The Carson-Steel Barn is situated very near the southern embankment of the Hopewell Mound Group (Figure 2.1.1). That south wall, which was constructed of smooth creek stones and

[6] Tina Bishop, et. al. *Hopewell Culture National Historical Park: Cultural Landscape Report and Environmental Assessment* (Chillicothe, Ohio: National Park Service, 2016), 2-9.
[7] Bishop et. al., *Hopewell Culture Cultural Landscape Report*, 2-11.
[8] "Adena culture | North American Indian culture," *Encyclopedia Britannica*. Accessed 2024-01-25. https://www.britannica.com/topic/Adena-culture.
[9] “Hopewell Mound Group,” Site Bulletin, ca. 2010, 1. (NPS e-library, accessed October 2023. http://npshistory.com/publications/hocu/index.htm#brochures.)
[10] Bishop et. al., *Hopewell Culture Cultural Landscape Report,* 1-4, 3-87.

clayey soil, was still roughly four feet tall in 1848 but no longer extant by the 1920s.[11] It is possible that the southern bay of the ca. 1868 addition was constructed where the embankment once stood.

The Hopewell culture was part of an extensive social and religious network of groups spanning northeastern North America. The expanse of Hopewell extended as far north as Lake Ontario and as far south as the Gulf of Mexico, in an area that stretched from the Atlantic Coast to the Rocky Mountains.[12] Material from different regions was buried in mounds with the bodies of those with high social status. Evidence of this has been found in Ohio mound excavations that revealed conch shells from the Gulf of Mexico and obsidian from the Rocky Mountains.[13]

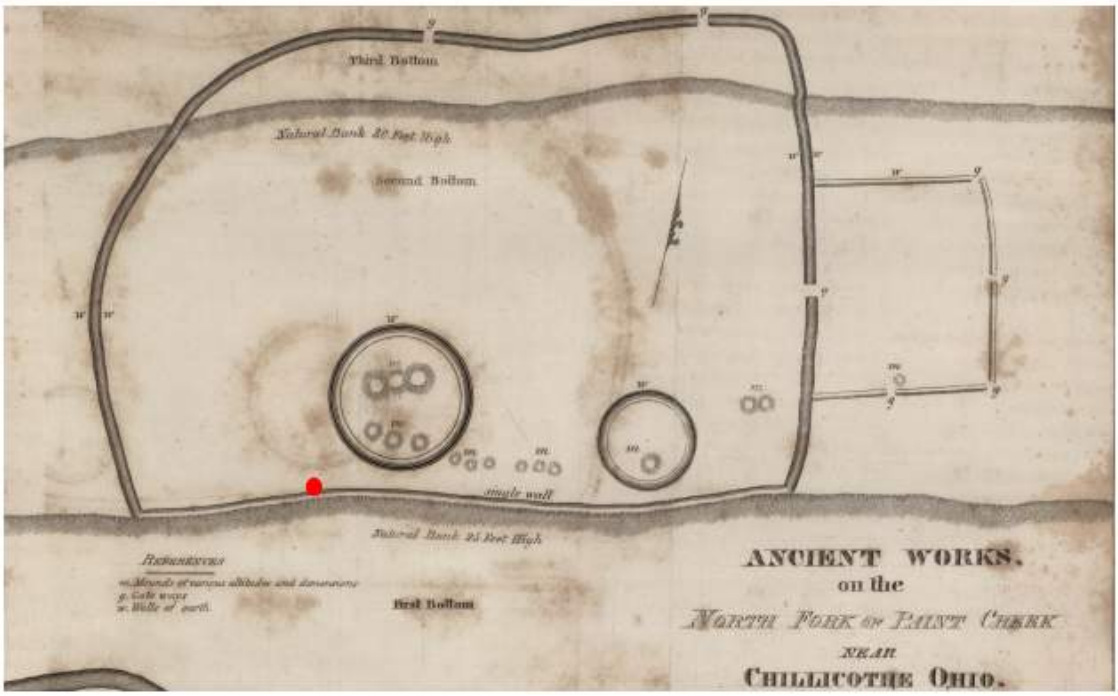


Figure 2.1.1. Caleb Atwater, *Descriptions of Antiquities in the State of Ohio and Other Western States* (New York: AMS Press, 1820), 182. The red dot indicates the approximate location of the barn.

The Hopewell culture did not leave any written records, but a substantial archeological record has significantly influenced modern understanding of Hopewell lifeways. While that is particularly true of ritual and funerary practices associated with the earthworks, the archeological record includes information about everyday life, indicating that settlements were often located close to the earthworks and water sources. Individual households within the settlements appear to have been widely scattered.[14]

[11] E. G. Squier and E. H. Davis, *Ancient Monuments of Mississippi Valley* (Washington D. C.: Smithsonian Institution, 1848), 27-28.
[12] Bishop et. al., *Hopewell Culture Cultural Landscape Report*, 2-11.
[13] "Indian Relics Reveal Early 'Traveling Man'," *Ford County Press* (Melvin, Illinois), August 12, 1927, 7.
[14] Bishop et. al., *Hopewell Culture Cultural Landscape Report*, 2-15.

The objects and practices characteristic of Hopewell became scant after around 400 CE, though Indigenous communities continued to occupy the region. Over time, dramatic changes in technology, community organization, foodways, and social structure were adopted, though not all at the same time. By 900 CE, some individuals and communities were using bows and arrows, growing maize, and living in small villages. Around 1300 CE, it appears that most communities had relocated their primary occupations outside the central Scioto River Valley, likely to areas closer to the Ohio River. Across these millennia, Hopewell earthworks continued to be utilized for funerary ceremonies and other gatherings, though clearly at a reduced frequency.

Post Contact American Indian History of the Region

The onset of the Beaver or Mourning Wars in the mid-17th century provoked a depopulation of large portions of the midcontinent, including what is now southern Ohio. It was not until around 1725 that various tribes began reoccupying the region, and a decade or so later, the Shawnee built a large town at the mouth of the Scioto River. For about the next half century, the Scioto Valley was the location of villages of several tribes, namely the Shawnee and Seneca-Cayuga. The Delaware, Miami, and other Algonquian-speaking tribes primarily settled on adjacent and nearby rivers, though individual towns typically included households from several American Indian tribes. During the period ca. 1750s-1770s, the Shawnee occupation, comprised of many towns on the Scioto and up its tributaries, centered near the location of the Carson-Steel Barn. One of the principal towns, known by the anglicized name “Chillicothe,” was located not far up the North Fork near present Frankfort and adjacent to a Hopewellian earthwork. Colonial pressures forced the Shawnee and other tribes out of the Scioto Valley, beginning shortly after Lord Dunmore’s War in 1774, marking the final long-term Indigenous settlement of the area.[15]

In 1783, the Treaty of Paris ceded the Ohio region from France to Great Britain. The British declared the area between the Appalachians and the Mississippi an Indian Reserve where white settlement was supposed to be forbidden. Colonists began to move into the area despite that law, and after the American Revolution, it was ceded to the newly formed United States, which spurred additional white settlement.[16] Shawnee and other tribes resisted until they were defeated at the Battle of Fallen Timbers in 1794, after which they ceded the majority of the Ohio Country in the 1795 Treaty of Greenville. Just five years later, Revolutionary War veteran General Nathaniel Massie established the present town of Chillicothe, which served as Ohio’s capitol from 1803-1810.[17]

Virginia Military District

Nathaniel Massie was in the Ohio Territory to identify and survey parcels of land in the Virginia Military District (VMD), which spans 4.2 million acres between the Scioto and Miami Rivers in

[15] Notes on this period are courtesy of Dr. Timothy Everhardt.
[16] Bishop et. al., *Hopewell Culture Cultural Landscape Report,* 2-21.
[17] *1796 History of Ross and Highland Counties, Ohio with Illustrations and Biographical Sketches* (Cleveland: Willam Bros., 1880), 47.

Ohio. The Hopewell Mound Group and Carson-Steel Barn are in Virginia Military Survey (VMS) 2531. The VMD is a military reserve established in 1784 to provide payment for Virginia veterans of the Revolutionary War.[18] After the war, the original thirteen colonies ceded their land to the newly formed United States, and several large tracts of land within that new territory were reserved for veteran grants (Figure 2.1.2).

The amount of land each soldier received depended on their rank and length of service. To secure the allotted land, a veteran had to hire a surveyor to identify and map a parcel, which was then recorded in the soldier's name. Surveyors knowledgeable about the territory were in high demand because they could identify choice parcels suitable for farming. Surveyors were frequently paid with shares of the land grants; in some cases, those fees totaled 25% to 50% of the veteran's total allotment.[19]

Nathanial Massie

Nathaniel Massie (1763-1813) was one of the first surveyors granted permission to work in the new territory, a status that eventually made him one of early Ohio's largest landowners. Massie was born in Goochland County, Virginia, in 1763. He rose to the rank of general after taking his father's place in the Revolutionary War. After the war, he finished surveyor training and moved to Kentucky, where he worked as a surveyor.[20] He probably learned about the Virginia Military District from Arthur Fox, a friend who had participated in an earlier surveying expedition there. Massie realized he would need to establish a base camp within the VMD to survey the area successfully. He promised payment in land to any family that moved with him to help with the survey. Around thirty families came with Massie and established the town of Manchester in Adams County in 1791.[21] Manchester was the first town in the Virginia Military District and the fourth in Ohio.

[18] John McDonald, *Biographical Sketches of General Nathaniel Massie, General Dunkan McArthur, Captain William Wells, and General Simon Kenton: Who Were Early Settlers in the Western Country,* (Dayton Ohio: Osborn and Son, 1852), 23.
[19] McDonald, *Biographical Sketches,* 22.
[20] McDonald, *Biographical Sketches,* 13.
[21] *History of Ross and Highland Counties*, 219.

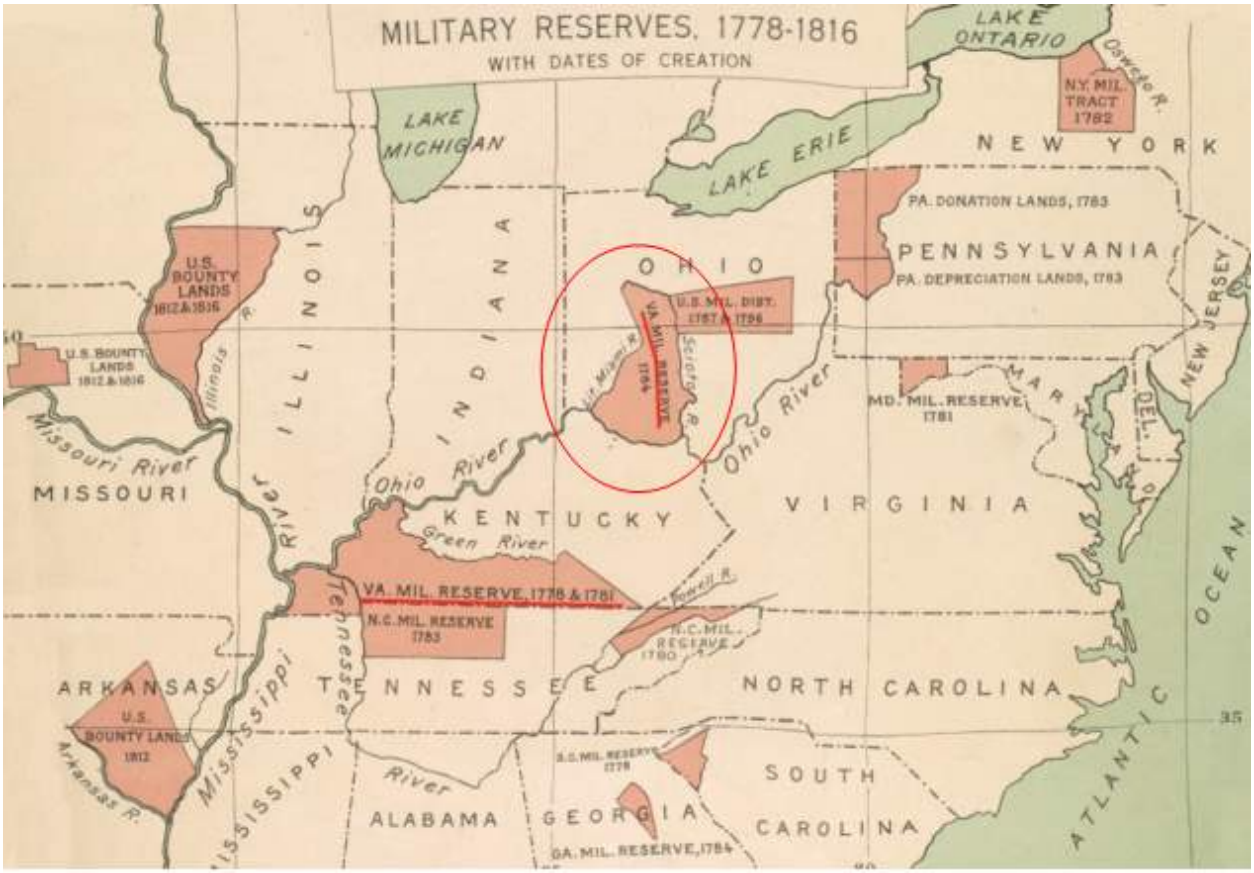


Figure 2.1.2. "Military Reserves, 1778-1816, with dates of Creation." The Virginia Military District is circled. (Charles Paulin, et. al. *Atlas of the Historical Geography of the United States*. Digital Scholarship Lab, University of Richmond, accessed February 2024.)

Through his work as a surveyor, Massie came to own numerous tracts of land in the VMD, including thousands of acres in what is now Union Township. Those landholdings included Virginia Military Survey (VMS) 2531, compiled from three military warrants totaling 750 acres along the North Fork of Paint Creek.[22] Nathaniel Massie surveyed the tract and filed it in his name in July 1795 (Figure 2.1.3). He also acquired a smaller parcel just south of 2531, part of VMS 8717. That tract, which includes bottomland on the north side of the creek, was warranted by D. McArthur.[23] There is no indication that Massie lived on either of those tracts or made any improvements, and he began reselling them within a few years. In 1798, he sold 400 acres to Joseph Darlington.[24] That 400-acre property contained land in both surveys, including the site of the Carson-Steel Barn.

[22] "No. 2531," Survey Book: Virginia Military District, Chillicothe, Ohio: Ross County Recorder's Office. That book contains photocopies of the original survey maps. The original maps were not found.
[23] "Map of Virginia Military District, Ross County Ohio," (Chillicothe, Ohio: Ross County Engineer's Office).
[24] That sale was cited in a later deed. (Ross County Deed Records, Deed Book 13, Page 477.)

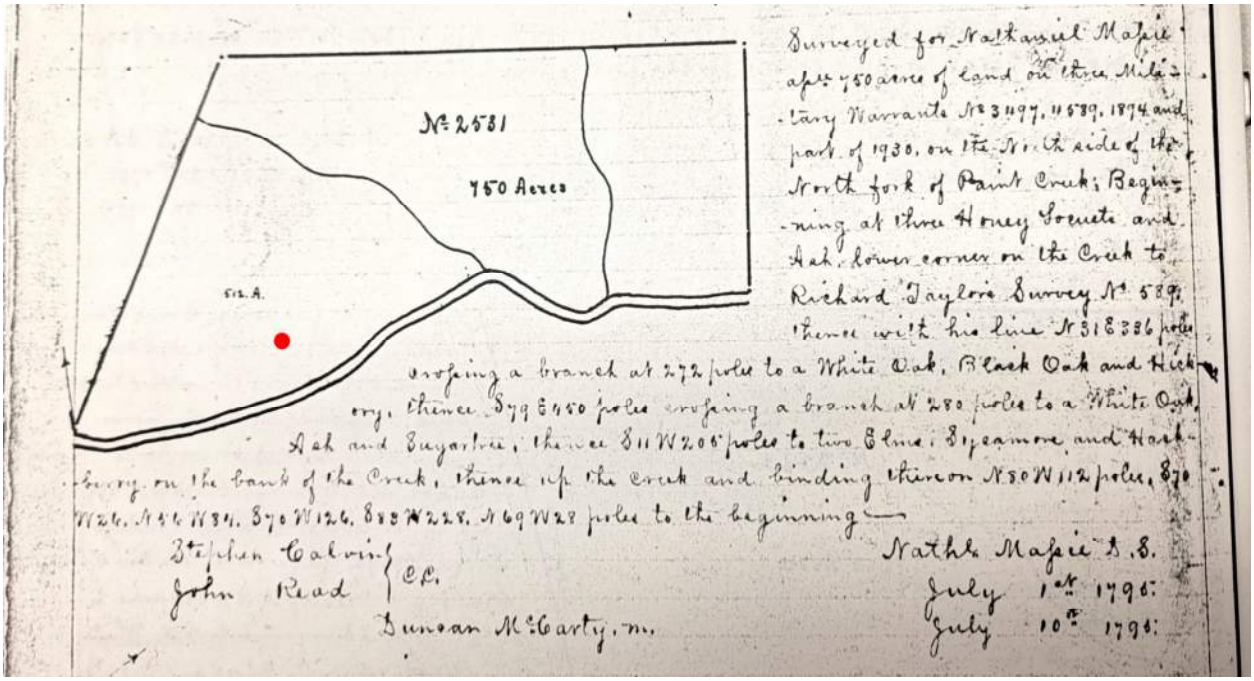


Figure 2.1.3. Reproduced photocopy of a 1795 map of VMS 2531, which Nathaniel Massie surveyed in 1795. The red dot marks the approximate location of the Carson-Steel Barn. (Survey Book: Virginia Military District, Ross County Recorder's Office.)

Joseph Darlington

Joseph Darlington (1765-1851) was born near Winchester, Virginia. He lived on a family plantation and was too young to serve in the Revolutionary War, but in 1777, his family kept over 600 British prisoners from the surrender at Saratoga. Darlington is said to have acquired a taste for travel and adventure while listening to the stories told by the prisoners on his father's plantation.[25] After time in Philadelphia and New Orleans, he met his future wife, Sara Wilson, in Virginia; they married in 1790.[26] The couple lived on a farm she owned in Pennsylvania for several years, and Darlington began a long career in politics when he became a county commissioner in Fayette County, PA. The couple moved to what is now Adams County, Ohio, in 1797. Ohio did not become a state until 1803, but counties began forming in the Northwest Territory in the 1890s. Adams County was formed in 1797, and Ross County was established a year later.

When Adams County was formed, Darlington became a probate judge, and in March 1798, he was appointed clerk of the board of Adams County and became one of the first Adams County commissioners.[27] He bought the land in the Virginia Military District that same year but, like Massie, does not appear to have ever lived there. He built a "double-hewed log house" in

[25] Nelson W. Evans, *History of Adams County, Ohio*, (West Union Ohio: Emmons B. Stivers 1900), 251.
[26] Evans, *History of Adams County, Ohio*, 251.
[27] Evans, *History of Adams County, Ohio*, 252.

Adams County in 1803 and lived there until his death in 1851.[28] Darlington held onto the land in Ross County until 1814 when he sold the 400-acre parcel to Jeremiah Ashby.[29]

Jeremiah Ashby

Jeremiah Ashby (1761-1842) appears to have been the first white person to live on the 400-acre parcel of VMS 2531 for any significant time. Ashby was a native of Prince William Township in Virginia. He was still living in Virginia when he bought the land from Darlington in 1814, but he moved to Ross County with his wife Mary and ten children soon after that purchase.[30] They were living in Ross County, presumably on the 400-acre parcel, by 1816, when Ashby sold part of the land he bought from Darlington to Edward Fitzgerald and Christian Hill.[31] That was the first of three large tracts Ashby sold in the next two years, presumably to help pay off a mortgage on the property held by Darlington.[32] He also sold two parcels to William Robinson, 46.5 acres in 1816 and 54 acres in 1817.[33] Ashby sold each of those parcels for roughly the same price per acre that he paid Darlington, about $10.

Shortly after those sales, Deputy Ross County Surveyor Benjamin Hough recorded the subdivided parcel for county records. Hough prepared a "Record of Jeremiah Ashby Survey" that included a map of the overall parcel and the property lines for the three landowners, plus smaller maps of the individual parcels (Figure 2.1.4).[34] Ashby owned the largest tract, with 252.75 acres, followed by Robinson, with 97.75 acres, and Fitzgerald and Hill, with just over 54 acres. Those survey records also show that Ashby family members were living on their land. One identified Jeremiah Ashby's large parcel as the land "on which the said Ashby now lives," and a description of the land sold to Robinson noted that the boundary line was "near Abraham Ashby's house."[35] Abraham was Jeremiah Ashby's son.

Although the survey put Jeremiah Ashby's large tract at 252.75 acres, it is described as 250 acres in all subsequent real estate tax records and deeds. Real estate tax records show that it is comprised of 200 acres in VMS 2531 and 50 acres in VMS 8717. That 250-acre parcel served as a single farm for the better part of the next century.

[28] Evans, *History of Adams County, Ohio*, 252-255.
[29] Ross County Deed Records, Deed Book 13, Page 477. Ashby's name has various spellings in early records, including Ashbee, Ashley and Ashba. Ashby is used in deed records and most other sources.
[30] Ohio, U.S., Compiled Census and Census Substitutes Index, 1790-1890. This source shows him as a resident of Ross County in 1816.
[31] Ross County Deed Records, Deed Book 13, page 475. The deed was dated 1814 and filed in 1816.
[32] Ross County Deed Records, Deed Book 13, page 350, 1816.
[33] Ross County Deed Records, Deed Book 13, page 352, 1816, and Deed Book 14, page 270, 1817.
[34] *"Record of Surveys Made by Surveyors of Ross County, Ohio: Survey Book 1," Page 5. (On file in the Ross County Engineer's Office, Fairgrounds Rd. Office, Chillicothe, Ohio*.) This nearly-forgotten map was found in county records by Timothy Everhart, PhD, Cultural Resource Program Manager of Hopewell Culture Historical Park, in 2022 or 2023.
[35] "*Ross County Survey Book 1"*, pages 7 and 8.

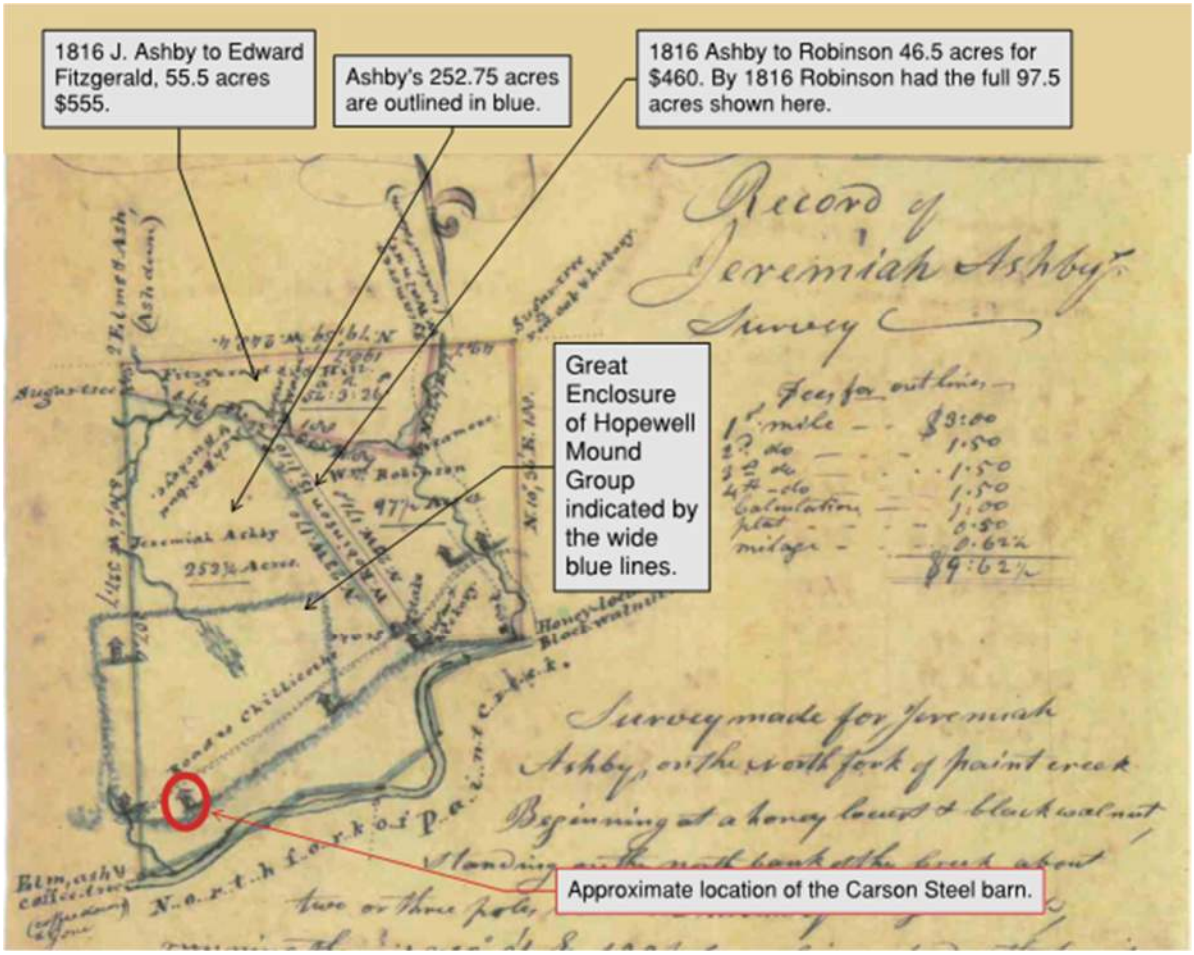


Figure 2.1.4. Map of "Jeremiah Ashby Survey," from a survey made in 1818 by Deputy Ross County Surveyor Benjamin Hough. ("Record of Surveys Made Surveyors of Ross County, Ohio," Survey Book 1, page 5. On file in the Ross County Engineer's Office, Chillicothe, Ohio.)
Scan of the map courtesy of Dr. Timothy Everhart, HOCU.

The largest survey map also shows the outline of the Great Enclosure of the Hopewell Mound Group, which was all on Ashby's land. The survey notes describe the enclosure as "the bank of an old fort."[36] Just a year or two later, the "old fort" was identified as an ancient earthwork by Caleb Atwater, who published his findings in 1820.[37] Caleb Atwater (1778-1867) was an attorney from Circleville, Ohio, who spent years exploring the region's mounds. He was one of the first to do so in modern times, and the resulting publication has been described as "the most important work of its time."[38] Atwater is credited with drawing the first map of the Hopewell Mound Group that included the mounds and secondary enclosures. (The 1818 survey map may be the first modern depiction of the overall enclosure.) Atwater wrote in his description of the site that the "land on which these works are situated belongs to Mr. Ashley (Ashby) and Col.

[36] "Ross County Survey Book 1," pages 5-9.
[37] Caleb Atwater, *Description of the Antiquities Discovered in the State of Ohio and Other Western States.* Ohio: American Antiquarian Society, 1820. (1972 Reprint AMS Press.)
[38] Jeremy Sabloff, "Introduction," *Description of the Antiquities*, ix.

Evans, of Ross County."[39] The Ashby survey shows that Evans owned land just west of Ashby's property in 1818.

Ashby was farming the property with his family when Atwater visited the site. The 1820 population census shows that he was a farmer in Ross County, with a household of 12. That record also shows that Jeremiah Ashby was living very close to four of his grown sons, most of whom had families of their own.[40] Abraham, Daniel, and Benjamin Ashby were listed on either side of Jeremiah, and John Ashby was three names down on the census list. The 1818 survey records offer clues about where the Ashby families lived. The map of the largest parcel shows three buildings on Ashby's land, all located close to the "Road to Chillicothe," also known as the Frankfort-Chillicothe Road. It is likely that at least some of those buildings were houses. One of the buildings is in the current area of the Carson-Steel Barn (Figure 2.1.4).

Despite sharing the farm with his extended family, Jeremiah Ashby retained legal ownership of all 250 acres until 1828, when he sold his 31-year-old son Daniel 50 or 51 acres of the farm.[41] That land was on the east side of the larger parcel, well away from the Carson-Steel Barn site. The following year, real estate tax assessments document a new "frame house" on Daniel Ashby's 51-acre parcel. Daniel Ashby had also acquired a 55.5-acre parcel of land in VMS 2531 that was owned by Fitzgerald and Hill when the 1818 map was created.[42]

Jeremiah Ashby may have sold the land to his son to help pay off his debt to Darlington. A year earlier, the Ross County Sherrif held a sale of Jeremiah Ashby's personal property advertised as "Levied upon the property of Jeremiah Ashby, at the suit of Joseph Darlington."[43] However, his financial difficulties appear to have continued, and on November 4, 1829, he sold the remaining 200 acres of his farm to William Carson, a dry goods merchant from Chillicothe.[44] That sale recombined the original 250-acre Ashby farm. Daniel Ashby had sold his 50-acre parcel to Carson just two months earlier, on September 7, 1829

Not long after the sale, Jeremiah Ashby, then 68 years old, moved to Indiana, where he spent the rest of his life. In the 15 years he owned the property, it changed from an isolated tract of wilderness to a multi-family working farm that remained in agricultural use for the next 174 years.

[39] Caleb Atwater, *Description of the Antiquities Discovered in the State of Ohio and Other Western States* (American Antiquarian Society, 1820; 1972 Reprint AMS Press), 183.
[40] United States Bureau of the Census, *1820 United States Federal Census,* accessed at Ancestry.com.
[41] Ross County Deed Records, Deed Book 24, page 94, 1828-29. The deed describes it as 50 acres, but real estate tax records list it as 51 acres.
[42] That parcel is listed in real estate tax records and a listing of delinquent taxes published in the *Scioto Gazette* in 1818.
[43] "Sherrif's Sale," *Scioto Gazette*, May 10, 1827, 2.
[44] Ross County Deed Records, Deed Book 24, pages 141-142.

Episode 1. Construction: 1829-1867.

Episode 1 encompasses the construction of the first section of the barn and the years it retained its original form. It was built by or for Wiliam Carson, a dry-goods merchant from Chillicothe who bought the 250-acre farm in 1829. The heavy timber frame building was built ca. 1831 with the help of a skilled barn builder. In 1833, Carson sold the building and property to Ross County native William C. Clark, who lived there with his family and farmed the property until his death in 1848. Clark's wife and daughters kept the property after his death, and it continued to be an active farm. George Steel, husband of Clark's oldest daughter Joanna, appears to have managed the farm for part of this period. The episode ends with the death of George Steel in 1867, after which Joanna Steel took over management of the farm. At the end of the episode, the 250-acre farm contained the timber frame building and a brick house that Clark added in 1841. The house and frame building were part of the same farmstead.

William Carson

William Carson was born in Greencastle, Pennsylvania, in 1789. He was a merchant in Pennsylvania and served in the War of 1812. In 1816, Carson sold his Pennsylvania business and moved to Chillicothe, Ohio, where he bought property and set up a dry goods shop.[45] He later bought property at what is now 70 Paint Street, where he operated a dry goods store for more than 20 years.[46] A few years later, he formed a partnership with his former clerk, Robert C. Galbraith. The new firm, Carson & Co., opened a second store in Frankfort, northwest of Chillicothe and the barn property.[47] The stores appear to have specialized in household goods and fabrics; probate records made after Carson's death document an immense inventory of fabrics, ranging from common calico to expensive satin.[48] In 1824, Carson married Elizabeth Faulkner Claypool, and they made their home in Chillicothe.[49] Carson's businesses thrived, and he became what one biography described as "an honored influential citizen and successful merchant."[50]

Carson bought the land from the Ashbys in two transactions. He bought Daniel Ashby's 51-acre parcel on September 7, 1829, less than a year after Daniel Ashby purchased the land from his father.[51] County tax records show that the 51-acre parcel had included a small frame house since at least 1828. Two months later, on November 4, 1829, Carson bought the remaining 200-

[45] *History of Franklin County, Pennsylvania* (Chicago: Warner, Beers & Co., 1887), 847; "Last Notice," *Franklin Repository* (Chambersburg, Pennsylvania), April 30, 1816, 4.
[46] Patricia Medert, *Paint Street,* (Chillicothe, Ohio: Private Press, 2004), 47.
[47] Lyle S. Evans, *A Standard History of Ross County, Ohio: An Authentic Narrative of the past, with Particular Attention to the Modern Era in the Commercial Industrial, Civic and Social Development, Volume II* (Chicago and New York: Lewis Publishing Company, 1917), 487.
[48] Ross County Probate Records, Chillicothe, OH, Case #1388, William Carson, 1840.
[49] *History of Franklin County*, 847.
[50] *History of Franklin County,* 847, 848; Isaac Finley, *Pioneer Record and Reminiscences of the Early Settlers and Settlement of Ross County Ohio,* (Cincinnati: Robert Clarke & Co., 1871), 131.
[51] Ross County Deed Records, Chillicothe, Ohio, Deed Book 24, p 94, 1829.

acre parcel from Jeremiah Ashby. That 200-acre parcel probably included the house where Jeremiah Ashby's property was auctioned in 1827. It also included the study property.

Wiliam Carson would have been familiar with the Ashby farms before he bought them, due to their location on the Frankfort-Chillicothe Road (now Sulphur Lick Road). Early maps show that the road has been in use since at least 1815 and that it was the most direct route between the two towns for most of the nineteenth century (Figure 2.1.5).[52] Carson is known to have used the road to visit his store in Frankfort, which would have taken him through the Ashby farm and probably right by Jeremiah and Daniel Ashby's houses.[53] After he bought the land, the farm no doubt became a stop on his route between his two mercantile shops.



Figure 2.1.5. 1860 Atlas Map showing the route between Frankfort and Chillicothe, with the farm. (1860 Atlas of Ross County)

It is possible that he used the services of a tenant farmer or other hired help to handle the farm's day-to-day operations. The Carsons do not appear to have ever lived on the property or engaged in farming while they owned the property.[54] The 1830 census shows that they lived in Chillicothe, with 10 people in the household, including 7 whites and 3 free Blacks. By 136, they had six children.[55] All those children were born in Chillicothe, indicating the couple lived in town

[52] John Melish, et. al. *A Map of the State of Ohio*, Chillicothe, Ohio. 1815. (Raremaps.com, accessed 2024), and Henry Francis Walling, *Topographical Map of Ross County, Ohio*. (New York : H. F. Walling's Map Establishment, 1860, Library of Congress, accessed 2024.)
[53] "Painful Death," *Public Ledger*, (Philadelphia, PA) Feb. 8. 1840, 2.
[54] William Carson's probate files show that he owned an extensive collection of dry goods at the time of his death, but no agricultural implements. Ross County Probate Records, William Carson.
[55] "Public Member Trees," *Ancestry.com.* Profile of William C. Carson (1879-1840), died in Chillicothe, Ross County, Ohio.

until at least 1836. Tax records show that he owned at least 100 acres of land and a brick house in Scioto Township in 1834, in addition to his commercial properties.[56]

Their Chillicothe address may have caused an error in the real estate tax rolls; William Carson was never listed in real estate tax books as the owner of the farm in Union Township. Tax records made the entire time he owned the property incorrectly list Jeremiah and David Ashby as the owners.[57] (See Appendix C. Real Estate Tax Records.)

Barn Construction

Carson added a new building to the farm property soon after he bought the land. That building comprises the core of the current barn. Trees for the building were felled between 1828 and 1830. It was common practice to fell the needed trees in the winter and use the timbers within a year, putting construction of Carson's new building in late 1830 or early 1831. Those dates were determined by testing the structural members with an expert in dendrochronology. Of the seven timbers tested, six are white oak; four were cut in 1830, and two in 1829. The white oak timbers were all used for major framing members. The seventh is a slippery elm pole rafter that was cut in 1828.[58] (See Appendix B. Dendrochronology Report.)

The ca. 1831 building has a heavy timber frame that sits upon large sill beams supported by fieldstone piers. It has a raised floor supported by joists that are let into the sill beams. The joist pockets in the sill beams appear to be early or original, which indicates that the floor is an early or original feature. About two-thirds of that floor structure is still in place. (See the hatched area in Figure 2.1.6, floorplan.) The finished floor sits slightly more than a foot above grade, with the perimeter grade beams and floor framing resting just above or at grade. The flooring is thick, and the floorboards are historic but may not be original.

The barn has a nearly square footprint with a high gable roof. The building measures roughly 26 by 24 feet and is just over 24 feet tall at the roof ridge (Figure 2.1.6, floorplan). When new, it likely had vertical plank siding, possibly with battens that covered the joints between the boards. The V-joint tongue and groove car siding that is now on the barn was installed later, probably in the mid-to late-1800s.[59] The roof ridge runs east-west, parallel to the longer walls. Despite its height, there is no evidence that the original ca. 1831 building ever had a second floor or loft (Figure 2.1.7, interior photo).

[56] That land and house were in Section 5, Township 1, Range 22. Ross County Tax Records (Chillicothe, Ohio), Scioto Township, 1824.
[57] Ross County Tax Records, Union and Scioto Townships, 1829-1835.
[58] Nick Wiesenberg, "Dendrochronological Dating of the Hopewell Culture National Historic Park Barn in Chillicothe, Ohio," (Wooster, OH: College of Wooster Tree Ring Lab, 2023.)
[59] That type of siding was in use by the mid-1800s. The original siding had definitely been replaced by 1922, the date of the oldest known clear photo of the barn.

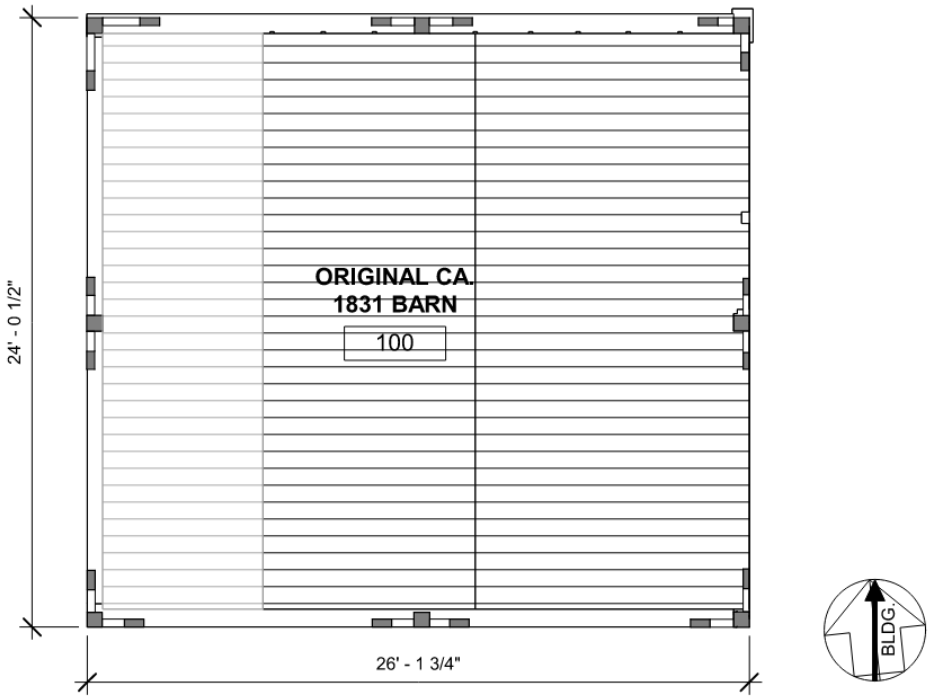


Figure 2.1.6. Current floor plan of the original barn. The darker hatched area denotes the surviving historic floor. (STRATA 2024)



Figure 2.1.7 Interior view of the original barn structure looking north. The timber frame in the foreground is the north wall of the ca. 1831 building. (STRATA 2023)

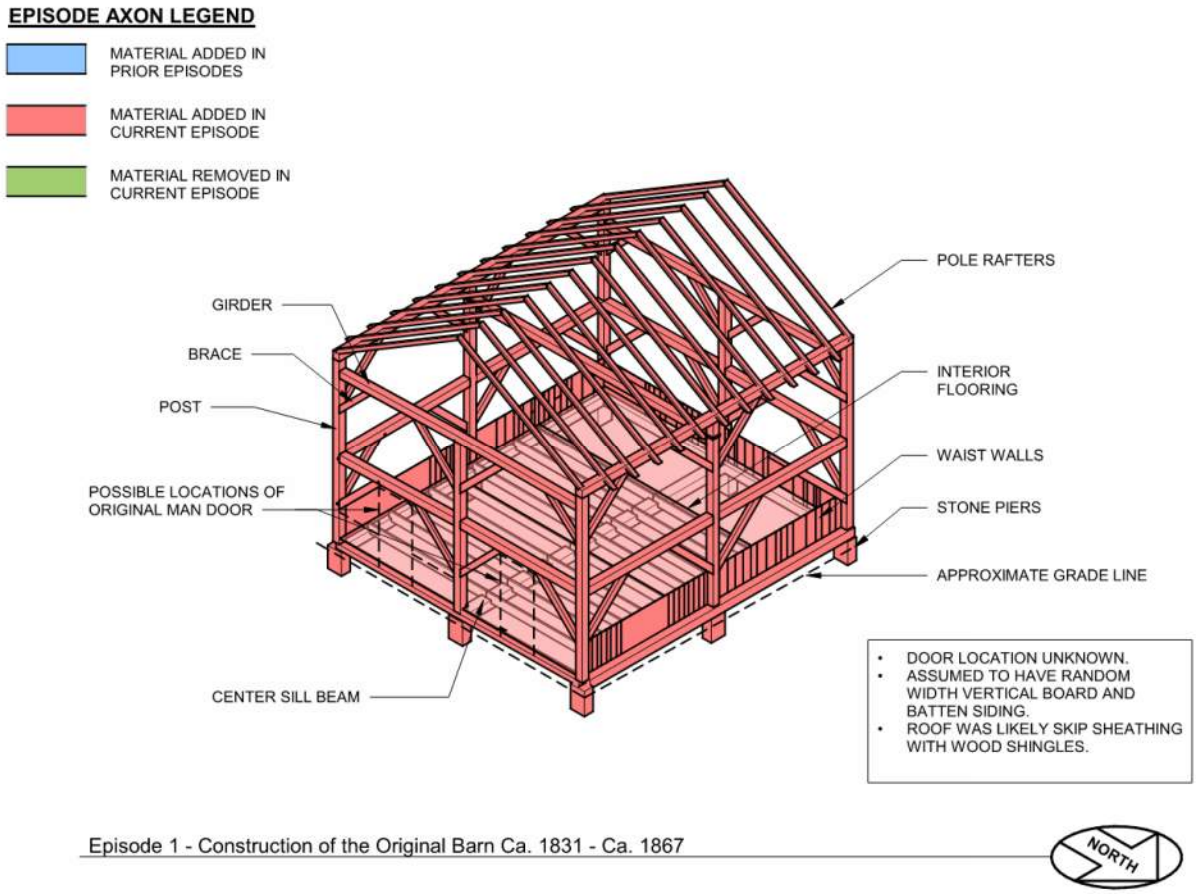


Figure 2.1.8. Axonometric view of the framing in the original section.
The front (east) wall is on the left. (STRATA 2024)

The original heavy timber framing system, which is exposed inside the barn, features hand-hewn timbers that are joined using the Scribe Rule method of timber framing (See Section 2.2 for more information about Scribe Rule). Scribe Rule framing is easily identified by Roman numeral marks that were chiseled into timbers by the builders to ensure they were correctly matched for specific joints. Those marks are commonly referred to as marriage marks. Most joints in the ca. 1831 barn have marriage marks (Figure 2.1.9). At least two of the joints at the tops of the posts feature Square Rule framing, a simpler method that does not require marriage marks.[60] Square Rule will be discussed in more detail later in this report.

[60] Rudy R. Christian, Memo to Sam Quackenbush, Hopewell Culture National Historical Park Re: Scribe Rule Barn (Carson-Steel Barn), April 2014. One of those joints is at the top of post S1; the other was not definitively identified during the field study due to the fragile nature of the structure. It is assumed that all corner posts are framed with the Square Rule, but this was not able to be verified due to the current deteriorated condition of the western-most posts.



Figure 2.1.9. Marriage Marks on Joint #3. (BP 2023)



Figure 2.1.10. Initials inscribed into a hewn brace in the northeast corner of the original section of the barn. (BP 2023)

Master Builder

One of the builders also used that same type of chisel to add the letters “M A,” presumably his initials (Figure 2.1.10). “M A” was most likely the supervising builder for the construction project. Scribe Rule construction required a skilled craftsman or master builder who mapped each joint and scribed timbers to mark the angles and locations of cuts. After that step, less-skilled workers could cut the timbers and assemble the frames. The master builder of Carson’s new barn could have been an area resident with expertise in that type of construction, or he may have used the services of a traveling barn builder.[61]

A review of local census records and county histories identified just two men with the initials M. A. who lived in the area and were of the correct age to have worked on the barn. They were father and son. Mahlon Anderson, Sr. (1771-1843) moved to Union Township in 1806, and the Anderson family owned large farms adjacent to the Clark property for most of the nineteenth century.[62] The village of Anderson Station, just west of the Clark Farm, is named for Mahlon Anderson’s brother, James Anderson, who owned that land in 1860.[63] His son Mahlon Anderson, Jr. (1809-1859) was born in Ross County; he platted the town of Andersonville in 1845 and was living in Illinois by 1850.[64] When the barn was built, the elder man was about 60, and his son was 22. If they were involved in the construction, it is likely that the elder Mahlon Anderson was the master builder, but his son may have worked on it as well.

It is also possible that Carson used the services of a professional builder. In larger cities, there was often enough local work that a skilled framer could keep busy close to home, but work in rural areas was more scattered, and master builders often had to travel from job to job. Many master builders traveled extensively, staying with property owners, working on multiple jobs in one area, and moving from one location to the next as work became available. Owners generally provided room and board and coordinated with their neighbors to arrange for several barn-building jobs in one area.[65]

Ohio barn expert Rudy Christian, who has been studying and working on historic barns in Ohio since the early 1990s, recently summarized the process associated with timber-framed building in the early 1800s. The trees were cut down in the winter to avoid the summer heat and take advantage of lighter workloads on the farm. They were trimmed and squared into timber where they were felled, to reduce the weight of the material hauled to the job site. Once it was time to start framing, the master builder laid out the frame, marked all needed cuts, and then enlisted less-skilled helpers to complete the project.[66]

[61] Rudy R. Christian, Interview with Angie Gaebler, et al. Video call, May 6, 2024. Rudy Christian is a historic barn expert who has been studying and working on historic barns in Ohio since the early 1990s.
[62] Henry Francis Walling, “Topographical Map of Ross County, Ohio,” 1860; Hueston T. Gould, *Illustrated Atlas of Ross County and Chillicothe, Ohio,* (Columbus, Ohio: H.T. Gould & Co., 1875); Evans, *A Standard History of Ross County*, 1917, 612; United States Bureau of the Census, *Population Schedules for Ross County, Ohio, 1830.*
[63] “Story of Andersonville,” *Chillicothe Gazette*, May 7, 1938, 67.
[64] “Story of Andersonville,” 67; US Population Census, *Ross County, Ohio*, 1850.
[65] Rudy Christian interview.
[66] Rudy Christian interview.

At that point, raising the barn became a group effort. A description of building one of the first hewed log barns in nearby Highland County in 1807 noted that it took around 50 people "to raise it, some coming thirty miles, and meeting at the 'raising' for the first time in their lives. They came on horseback, bringing their axes with them."[67] Whether supervised by a neighbor or a traveling framer, the Carson building was most likely created via a comparable process.

Function of the New Building

The building erected for William Carson has an unusual form. The nearly square footprint and very high open interior set it apart from common barn types in use at the time (See Section 2.2 for more discussion of barn types). Another major difference between the Carson building and other early barn types is the lack of evidence of a door large enough to accommodate a wagon in any of the original walls.

Barn construction (plan, form, roofline, and interior features) typically reflect agricultural practices and cultural associations of the region where they were built. Although the unusual form of the Carson building could mean that it was not originally intended to serve as a barn, no plausible alternatives have been identified. It is the appropriate size and shape to serve as a dwelling, but the lack of a second floor or loft area makes that function unlikely (and there are no signs there was ever a loft constructed within the original frame). Additionally, there is also no sign of a fireplace or stove flue, and heat would be requisite for a dwelling. Finally, real estate tax records of the time show only one house on the property, a frame dwelling on Daniel Ashby's land, which is east of the barn site.

The shape is comparable to that used for early schools, churches, or meeting houses. One county history notes that a "frame meeting-house" was built in Union Township "a short distance from the old Baptist Building on Anderson Road" in 1834, so there is a precedent for that type of building in the area.[68] But again, the exceedingly high roof and lack of heat are not compatible with that type of use. It also seems unlikely that Carson would build a meeting house in the country when he lived in Chillicothe.

The most likely scenario, therefore, is that the building was built to serve as a barn and that it served that purpose for most, if not all, of its existence. Carson or his tenant farmers may have used it to store hay and animal feed or to shelter livestock. Hay was generally kept loose in high stacks at the time[69] (Figure 2.1.11, barn interior). The open interior would have lent itself to stacking hay out of the weather. High stacks of hay required interior ladders for access, which were sometimes built into the walls of early barns, but they could also be freestanding. An inventory included in 1860s probate records for George Steel, who owned the property later, mentions "a pair of feed ladders."[70] (There is also a built-in hay ladder in the barn today, but it

[67] *History of Ross and Highland Counties*, 1880, 506.
[68] *History of Ross and Highland Counties*, 1880, 500. That description noted that the meeting house was later replaced with a brick building.
[69] Allen G. Noble and Hubert G. H. Wilhelm, *Barns of the Midwest* (Athens, Ohio: Ohio University Press, 1995), 88.
[70] Ross County Probate Records, Case #7993, George W. Steel, 1867.

may be a later addition). Unlike the Carson barn, however, hay barns also generally included large doorways so the wagons could be driven into the barn for unloading (Figure 2.1.11).

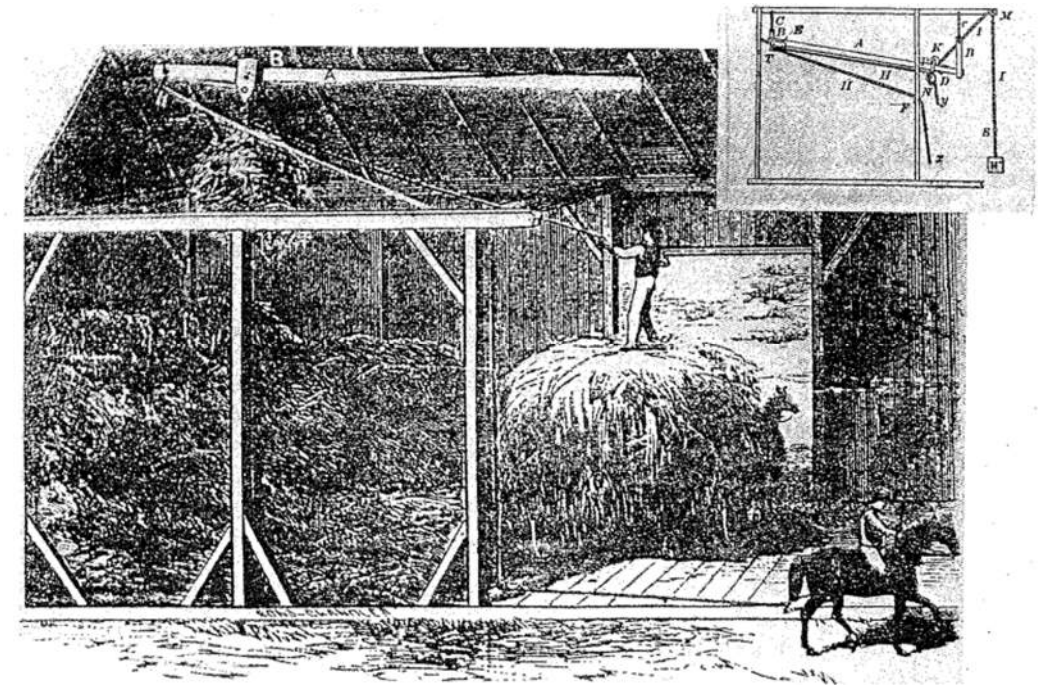


Figure 2.1.11. Drawing of hay being unloaded into a heavy timber-framed barn. This drawing was made in 1872 to illustrate the use of a hay fork, a mechanical device for loading hay that was invented in the 1860s. (Midwest Barns, 88)

The presence of a sturdy floor structure also invites speculation that it was used for threshing wheat, a function that was frequently combined with feed storage. At the time Carson's building was constructed, wheat and other grains were threshed by hand inside threshing barns.[71] (Threshing machines were invented in the 1830s, but they were not widely used in the region until the 1880s.) Threshing barns always included well-constructed floors that were heavily reinforced to tolerate the repeated pounding needed to separate grains from their stalks.[72] Most were also three bays wide. The floors were often edged by solid waist-high walls that helped keep the grain in place, a feature found in the Carson barn. Finally, threshing barns included doors at opposite ends of the floor structure to encourage crosswinds to help separate the chaff from the grains. At least one of those doorways was generally large enough to admit a wagon, which, as noted above, is missing from the Carson building.

The lack of an original wagon doorway may indicate that the building was used to shelter livestock (Figure 2.1.12, stock farm). There was ample room for animal-sized doorways in the new building. Livestock would almost surely have been a part of any farming operation on the

[71] Rachel Kennedy and William Macintire, "Agricultural and Domestic Outbuildings in Central and Western Kentucky, 1800-1855," (Kentucky Heritage Council, Kentucky State Historic Preservation Office, 1999), 25.
[72] Charles Calkins and Martin Perkins, "The Three-Bay Threshing Barn," *Barns of the Midwest*, 40-56.

property. Most farmers in the area at the time practiced what one author described as “general farming,” with a mix of livestock and crops.[73] Although Carson does not appear to have owned more than one horse and one cow when he built the barn, he may have had a tenant farmer who owned more livestock.[74] Probate inventories and agricultural census records show that most farmers owned at least a few horses and cows, and many also had mules. Smaller livestock, such as sheep and pigs, were also common. Any of those animal types could have been housed in the Carson barn. Housing animals in a barn with a raised floor would have necessitated a ramp of some type outside, but that is not an unusual feature.

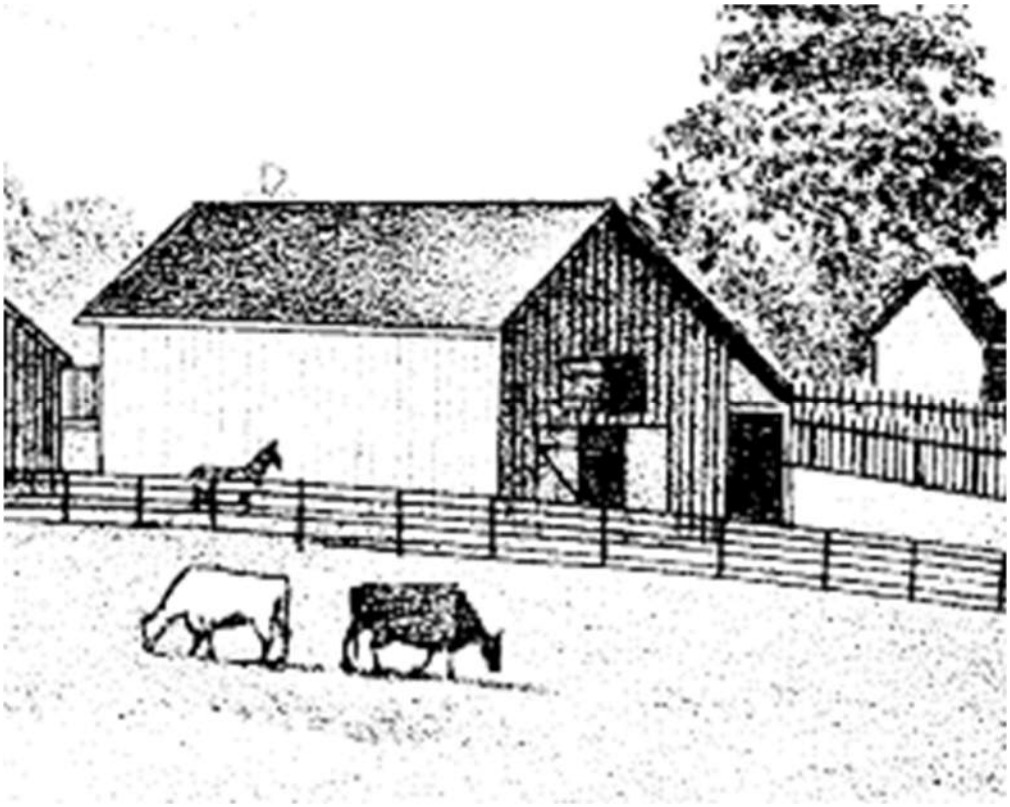


Figure 2.1.12. Stock barn in Mason County, Kentucky, image from an 1870s Atlas, barn age unknown. (“Agricultural and Domestic Outbuildings in Central and Western Kentucky,” 7.)

Whatever the intended function, William Carson owned the new building for only a brief time. In 1833, just four years after he bought the farm, he sold the property to William C. Clark. Clark paid $3,200 for the same land Carson bought for $1,800.[75] That substantial increase in value most likely reflects a number of improvements made by Carson, including the construction of the new Scribe Rule building.

[73] Robert Leslie Jones, “Ohio Agriculture in History,” *Ohio History Journal, 234.* (Accessed online 2024.)
[74] Ross County tax records indicate that he owned just one horse and one cow in 1830.
[75] Ross County Deed Records, Book 27, pp 309-311.

Carson continued to travel past the farm as he shuttled between his stores in Chillicothe and Frankfort. He may have increased the frequency of those trips after 1839, when his partner left to take up farming.[76] William Carson died on that same road in January 1840 after being thrown from his buggy while traveling from Frankfort to Chillicothe.[77]

William Clark

Unlike previous owners of the farm, Willam C. Clark (1802-1848) was an Ohio native. His father, Joseph Clark, one of Ross County's first white residents, owned land a short distance east of the farm purchased by William Clark.[78] William Clark grew up on his father's farm, and in 1833, he helped organize the second Ross County Agricultural Society, which held regular agricultural fairs to promote local agriculture. In 1834, that organization also spawned the Ohio Importing Company, which was formed specifically to import "fine cattle" from England. His experience with those groups may have spurred his decision to purchase Carson's farmland.

Clark was 31 years old and single when he bought the property from Carson. He married Sarah Platter two years after that purchase, in 1835, and they started a family soon after. The Clarks also owned land and a house south of the creek in nearby Twin Township in the 1830s, and they appear to have lived there. (The North Fork of Paint Creek is the boundary between Union and Twin Townships.) Their daughters were born in Twin Township, Joanna in 1839, and Carrie in 1841.[79] The Twin Township land included 100 acres in VMS 2460 and a 7-acre parcel in VMS 4771. The house was on the 100-acre parcel. (See Figure 2.1.13 Below) There is no evidence that any buildings in Twin Township associated with the Clarks are still standing.

[76] Evans, *A Standard History of Ross County*, 1917, 487.
[77] "Painful Death," *Baltimore Sun* (Baltimore, Maryland), Feb. 6, 1840, 3.
[78] Walling, "Topographical Map of Ross County, Ohio," 1860, shows James Clark as the owner of a 500-acre farm, just the two men were listed close together in the 1840 census. *History of Ross and Highland Counties*, 1880, 261.
[79] "Public Member Trees," *Ancestry.com*, William C. Clark (1802-1843). The only William Clark found in Ohio population census records in 1840 was listed as the head of a household of seven in Summit County, Ohio, but that does not appear to be the same person.

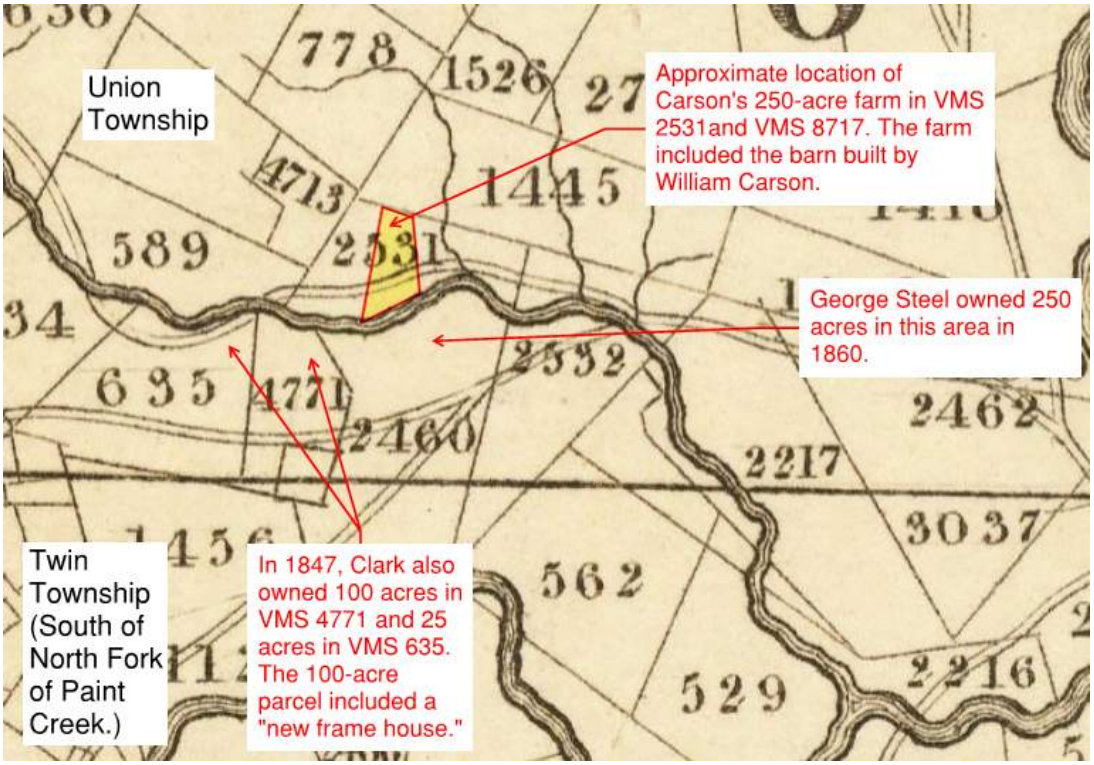


Figure 2.1.13. 1815 Ross County map, showing early roads and land owned by William Clark in the 1840s. (Base Map "A Map of the State of Ohio from Actual Survey By A. Hough & C. Bourne Chillicothe, Ohio. 1815; land ownership from Ross County Tax Records.)

In 1841, the Clarks constructed a brick house on their Union Township property, close to Carson's frame building.[80] The new house is specifically noted in county real estate tax records; it is the only new house recorded on the 250-acre farm since Daniel Ashby built a frame house there in 1829. A map of the farmstead that was made ca. 1846 depicts the barn and house, with the label "Clark's" (Figure 2.1.14. Squier and Davis Map). It is unclear who was living there; however, records show the Clark family lived in Twin Township. Alternatively, the house could have been constructed for a tenant farmer.

The 1840s map was the work of Ephraim Squier and Edwin Hamilton Davis, antiquarians who surveyed the ancient works in the region in 1845-1846 and published their findings in *Ancient Monuments of the Mississippi Valley* in 1848. The map labels the earthworks on the Clark farm (now known as the Hopewell Mound Group) as "North Fork, Works," after the North Fork of Paint Creek, but the narrative description of the site refers to it as "Clark's Work" and notes that the earthworks were on the "estate of W. C. Clark, esq."[81] An aerial photo of the farmstead taken in 1984 gives a three-dimensional view of the farmstead shown on the Squier and Davis map (Figure 2.1.15., 1984 aerial).

[80] Ross County Tax Records, Union and Twin Townships, 1833-1861.
[81] E. G. Squier and E. H. Davis, *Ancient Monuments of Mississippi Valley* (Washington D. C.: Smithsonian Institution, 1848), 26-28.

The ca. 1846 map confirms that the barn erected for William Carson was part of the primary farmstead for Clark's 250-acre property. That map also shows a rectangular shape on the west side of the ca. 1831 barn that may be an addition or a fenced yard. Several other straight lines on that map appear to be fence lines.

That map is the only one known to show the spatial relationship of the ca. 1831 barn to the southern wall of the Great Enclosure, which was still in place when the map was made. It shows that the barn sat about 50 feet from that wall, which is also described in the site description that accompanies the map: "On the side next to the creek, (the largest enclosure) is bounded by a wall four feet high, running along the very edge of the terrace-bank and conforming to its irregularities."[82]

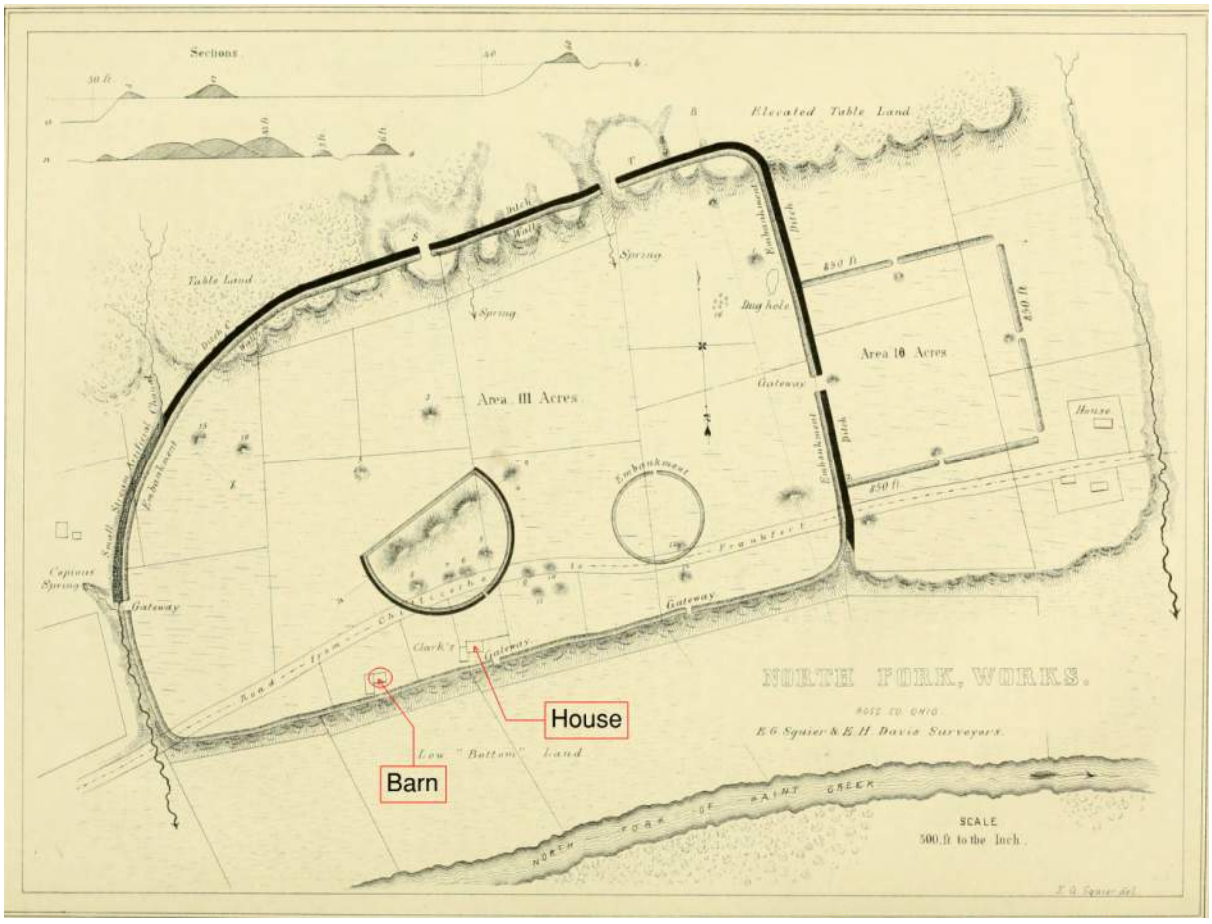


Figure 2.1.14. Map of the Hopewell Mound Group, part of William C. Clark's Farm when the map was made, ca. 1846. This is the earliest known map that shows the Carson-Steel Barn and the first to show that it was part of the primary farmstead for the full farm. (E. G. Squier and E. H. Davis, *Ancient Monuments of Mississippi Valley,* Washington D. C.: Smithsonian Institution, 1848, opposite p. 26.)

[82] Squier and Davis, *Ancient Monuments, 27.*



Figure 2.1.15. Aerial photo of the farmstead, taken in 1984, looking south. The house on the left is probably the one Clark added in 1841. The Carson-Steel Barn is on the far right, behind the one-story rectangular shed. (*Vintage Aerials.com*, 2024)

William C. Clark died in 1848, just a short time after Squier and Davis visited the site. Ownership of the land in Union Township passed to his wife and daughters, who continued living in Twin Township for several years after William Clark's death. The Union Township farm was probably operated by tenant farmers or leased to other area farmers for the next several years. An inventory of Clark's estate that was made after his death indicates a relatively modest farming operation, with one carriage, one wagon, two horses, seven cows, and nine sheep. The estate also included some wheat still in the field, but the relatively low value assigned to that crop indicates it was a small parcel.[83] The inventory also listed numerous tools, including a saw and "barn tools."

In 1859, William and Sara Clark's oldest daughter Joanna married George W. Steel, a Chillicothe merchant.[84] The 1860 population census shows the couple living in Chillicothe's Fourth Ward, with Sarah Clark, their 1-month son William C. Clark, and Elizabeth Richards, a servant who had been living with the Clark family since at least 1850.[85] In July 1863, George W. Steel, then 27, was drafted into service for the Civil War. He is listed as a farmer on his 1863 draft card, which may mean he had taken over farming duties for the farms in Union and Twin Townships.

George Steel survived the Civil War and returned to Ross County but died of unknown causes in 1867.[86] An inventory of his estate included in probate records indicates he was operating a

[83] Ross County Probate Records, Case #1438, William C. Clark, 1848.
[84] Ross County Marriage Records, 1859, *Ancestry.com*.
[85] US Population Census, *Ross County, Ohio, 1860;* United States Civil War Draft Records*, George W. Steel, 1863.*
[86] Note: records show that there were two George Steels of comparable ages in the area in this period, and they are frequently mixed up. Ross County probate records confirm that Joanna Steel's husband died in 1867. The other man was killed in action in 1864, per the *History of Ross and Highland Counties*, 133.

sizeable farm (or farms) at the time. The list of assets included cows, horses, mules, more than 40 pigs, rye, corn, and wheat. Crops included 121 shocks of corn, more than 400 shocks of fodder, 14 acres of "bottom wheat," 14 acres of "upland wheat," and 13 acres of upland rye. That mix of farm products appears to have been typical; the 1860 agricultural census shows that all farms in the immediate area were mixed-use farms producing dairy, wheat, corn, potatoes, and hay; no one in the vicinity of the farm was raising tobacco.[87]

George Steel may also have been planning an expansion of the barn; dendrochronology for the addition shows that the timbers for the barn were cut in 1867, the same year he died.[88] Steel's widow, Joanna, completed that project. Joanna Steel probably helped manage the farms while her husband was at war, and she resumed those duties after his death.

Summary of Appearance in 1867, at the end of Episode 1.

Plan and Shape: Nearly square footprint and almost two stories tall but lacking an upper floor.

Roof: Gabled, probably covered with split-shake wood shingles.

Exterior Walls: Supported by heavy timber structural frame, probably covered with sawn vertical plank siding, possibly with battens. The siding in place in the west gable end of the ca. 1831 barn may be original.

Doors and Windows. Indications of original doors are no longer extant.

Interior Finishes: The barn had a typical interior with exposed framing, with the backside of the siding visible inside the building. The existing waist-high plank wall was probably in place along the inside edge of the framing. The floor was covered with thick floorboards, placed close together.

[87] United States Bureau of the Census, *Agricultural Census Schedules for Ross County, Ohio,* 1850, 1860; "Topographical Map of Ross County, Ohio," 1860.
[88] Wiesenberg, "Dendrochronological Dating of the Hopewell Culture National Historic Park Barn."

Episode 2. Joanna Steel and Barn Expansion: 1868-1888

The barn was expanded to its current form in Episode 2, which corresponds to the time Joanna Steel operated the farm. Steel owned the property longer than any other owner to date. She inherited it from her father in 1848 and took control of farm management around 1867. One of her first tasks was overseeing the Carson barn's expansion to its current form ca. 1868. The addition to the barn, which more than tripled its size, utilized Square Rule timber framing. Episode 2 ends with Joanna Steel's death in 1888. At the end of this episode, the barn looked much like it does today--three bays wide, with a one-story addition that wrapped around three sides of the building. The tall center bay had a narrow doorway, and the side bays each had wagon doors.

Joanna Steel

With the death of her husband, George, in October 1867, Joanna Steel found herself widowed at age 28, responsible for the financial support of two young children and an elderly mother. She took over management of the farms she inherited from her father, and they supported her and her family for the next 20 years.

Following standard practice of the time, much of George W. Steel's personal property was sold after he died, but probate records show that Joanna Steel was able to retain a good deal of farm-related property before the estate sale that took place in November 1867. The probate file for George Steel includes a list of personal property that was allotted to her and her children before the estate was sold, along with a longer list of items "taken by the widow at appraisement"[89] (Figure 2.1.16. probate list). No real estate appears to have been sold when the estate was settled; that land had remained in the name of William Clark's heirs. (See Appendix C. Tax Records.)

The allotment consisted of 20 bushels of wheat, 7 bushels of potatoes, 12 hogs, 200 bushels of corn, and two stacks of hay. The items she took at appraisement included a shotgun, a wagon and harness, a hay rake, a mowing scythe, and the "feed ladders" mentioned above. She also took additional livestock and crops: 15 pigs, 1 cow, and 3 horses, plus two more stacks of hay, 121 shocks of corn, and 13 acres of rye.

The family was living in Union township by 1870, when the population census shows her as the head of a household there, presumably on the 250-acre farm. The household included Joanna, her children William and Carrie, her mother Sarah, longtime servant Elizabeth Richards, one other female servant, and two farm laborers.[90] Although Joanna Steel was the head of the household, which was on a farm, her occupation is listed in the 1870 census as "Keeping House."

[89] Ross County Probate Records, Case #7993, George W. Steel, 1867.
[90] US Population Census, Ross County, Ohio, 1870.

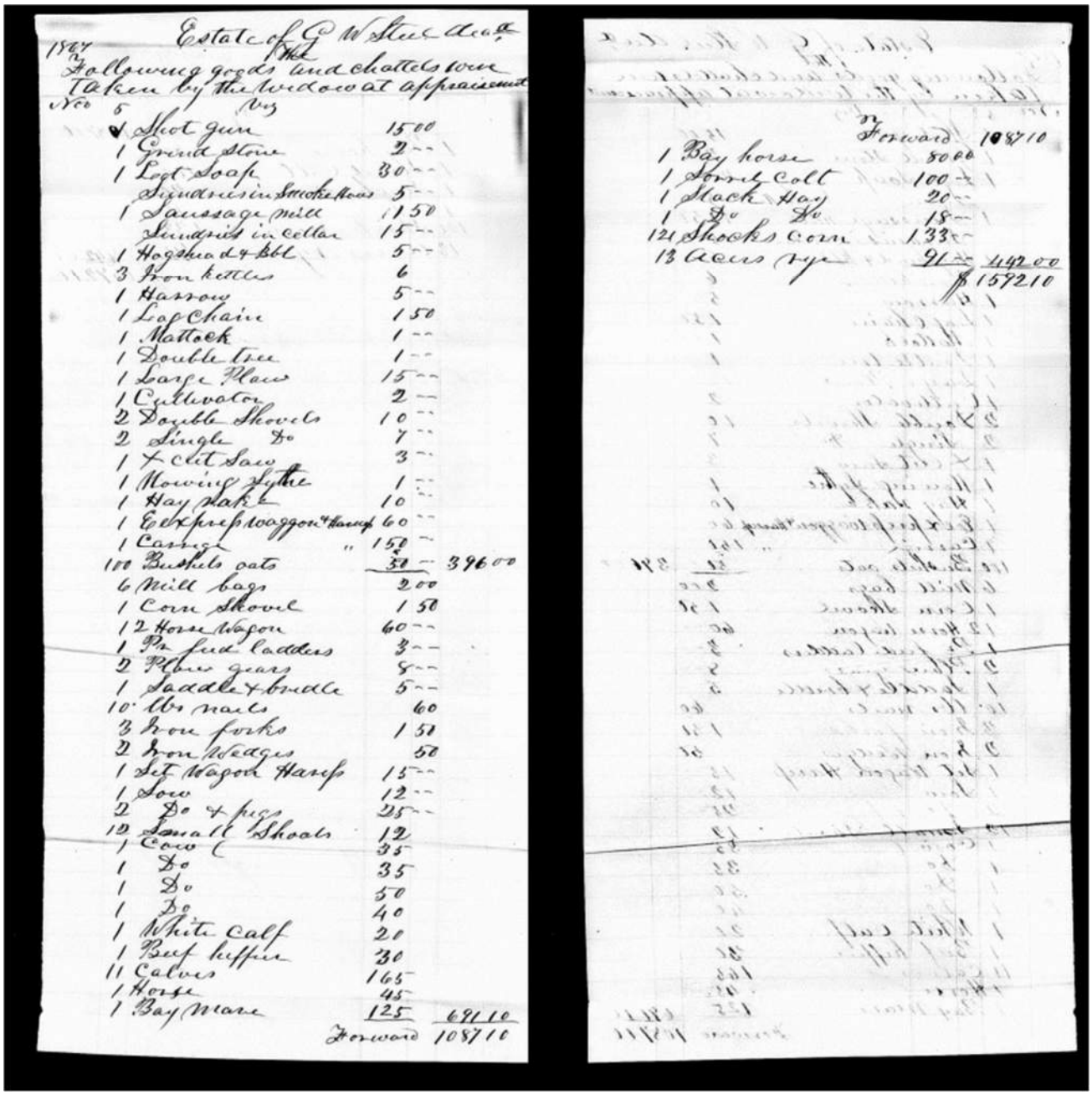


Figure 2.1.16. List of goods "taken by widow at Appraisement" of George Steel's estate. (Ross County Probate Files Ancestry.com, 2024.)

Barn Addition: ca. 1868

One of the first tasks Joanna Steel oversaw after taking over the farm appears to have been a major expansion of the ca. 1831 barn. Dendrochronology testing has shown that the trees for that project were felled in 1867, which puts the construction of the addition around 1868.[91] As

[91] Wiesenberg, "Dendrochronological Dating of the Hopewell Culture National Historic Park Barn."

noted above, trees were generally felled in the winter for construction the following year. Although it is possible that George Steel had the trees felled and the barn built before his death on October 12, 1867, it is more likely that the addition was constructed in 1868 under Joanna Steel's management.

The addition wraps around three sides of the original structure, covering the original exterior walls except the east (front) elevation and a small section of the upper west gable end (Figure 2.1.17, elevations). The east and west bays of the addition have shed roofs that continue the slope of the original roof, and the west (rear) bay is topped with a hipped roof. Each bay is one story, with a small loft in the rafter space above. The addition greatly increased the useable space in the barn; interior floor space grew from around 600 feet to just over 2,000. With the additions, the barn is about 52 feet wide and 40 feet deep (Figure 2.1.17, Elevations).

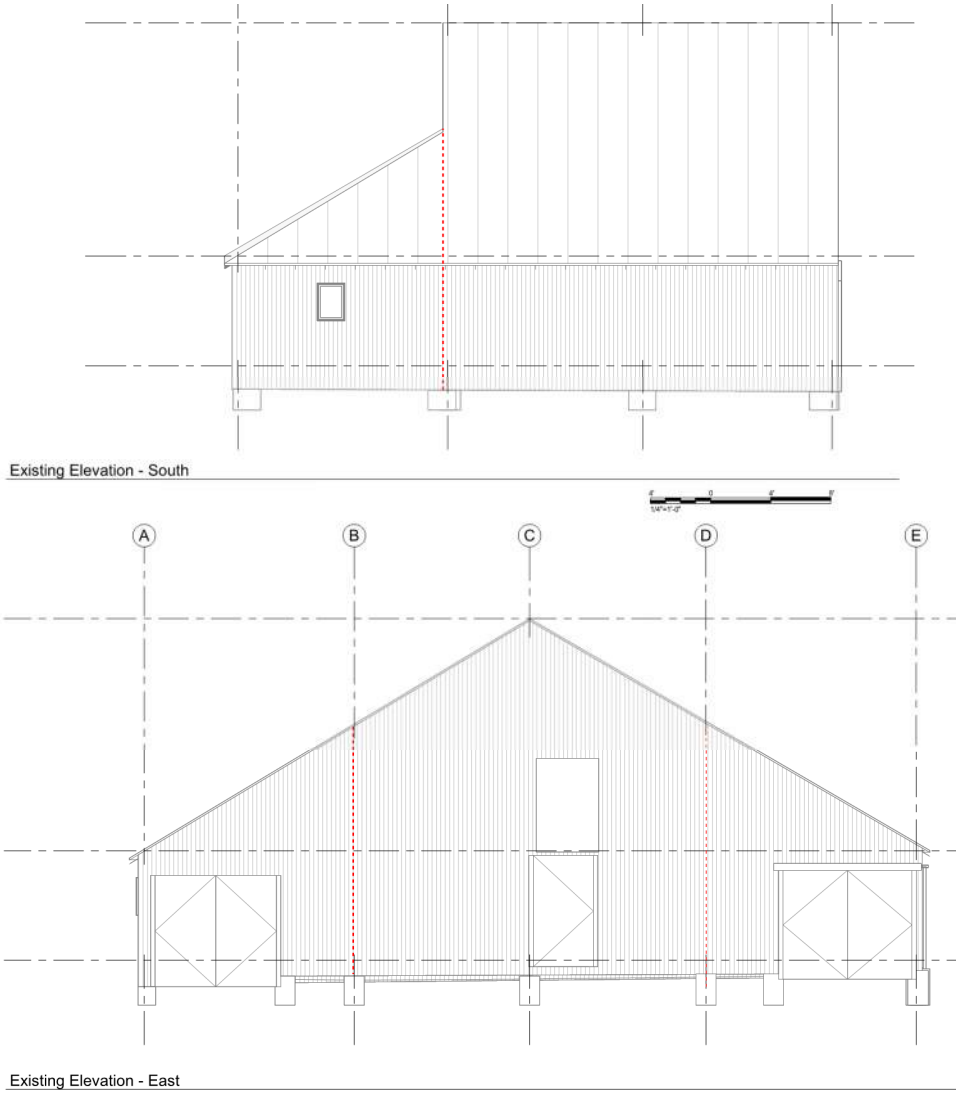


Figure 2.1.17. Existing elevations. The dashed red lines indicate the original exterior walls of the original central barn structure. (STRATA)

Like the original barn, the addition has a heavy timber frame that rests on fieldstone piers. The addition lacks the large sill beams and floor structure found in the original barn. The structural framework is joined by mortise and tenons but differs from the older section in that all joints in the addition are put together using the Square Rule method of timber framing (See Section 2.2 for more information about Square Rule). Many elements of a Square Rule frame are interchangeable, which eliminated the need for the type of marriage marks found in the ca. 1831 part of the building. The addition also reflects an expanding timber mill industry, in that some of the framing members are sawn instead of hand-hewn (Figure 2.1.18, Episode 2 framing diagram).

It is not clear if the addition was enclosed when it was new. The existing siding on the barn is fastened with round wire nails, which were not used for construction until the 1870s and not widely used in this type of application until the late 1880s.[92] It is possible that the addition originally served as an open loafing shed for livestock, with covered storage for hay and wagons. The siding could have been added later as time and finances allowed. It was definitely in place by the early 1920s because it is visible in a ca. 1922 photo of the barn (See Figure 2.1.24). The metal roofing, by contrast, was probably part of the original expansion project.

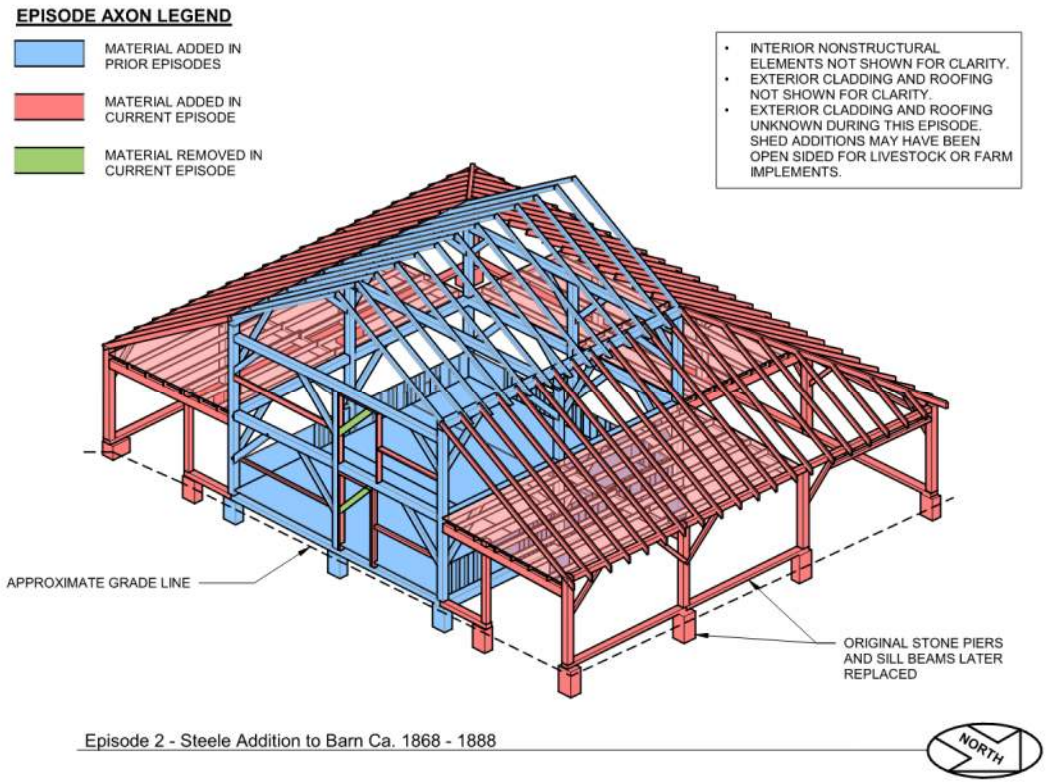


Figure 2.1.18. Ca. 1831 Original Barn structure (blue) with ca. 1886 addition (red). (STRATA)

[92] Hugh Howard, *How Old is This House?* (New York: Farrar, Straus, and Giroux, 1989), 55.

The enlarged barn is a transverse frame barn, a common barn type that has a gable roof, with the main entrance to the barn in the gable end (Figure 2.1.19). Transverse frame barns have rectangular footprints with long interior aisles that run parallel to the roof ridge. The remodeled Carson-Steel Barn is a variant of that barn type known as the Midwest three-portal barn. The Midwest three-portal barn type was very common in the nineteenth and twentieth centuries, to the point that one source described it as "the standard barn type" in the southeast and Midwest (Figure 2.1.20. Three-portal barn).[93] Midwest three-portal barns tend to be relatively large buildings that are suitable for a range of functions. As the name implies, each aisle has at least one door on the front wall of the barn; at least some of those doors are wide enough for wagons or tractors. The center aisle is often a drive bay, with wagon doors on each end. In transverse frame barns used for food storage, the center aisle served as a wagon drive (and sometimes a threshing floor), and the side aisles were used for stables or storage. In dairy operations, the center aisle was often used for feeding, with milking stations and stalls in the side aisles.[94]

The popularity of a barn type that would accommodate multiple functions reflects common farming practices of the period. Agricultural census records for Union Township show that all or most farmers there in the 1860s and 1870s had a variety of livestock and crops. In 1860, 182 separate farms were listed in the agricultural census. All 182 had horses, 180 had milk cows, and 175 had swine. Most farmers also kept sheep, and a few had oxen ("working cattle") and mules. Every farm produced field crops. All 182 had corn, and 173 also had wheat. Potatoes were also common, and many farmers also raised oats and or rye. Available 1870s agricultural census records, which include only township-level statistics, show comparable patterns of use. Unfortunately, no individual agricultural census entries were identified for owners of this farm in either 1850 or 1860. The farm may have been leased or operated by tenant farmers when those records were made.

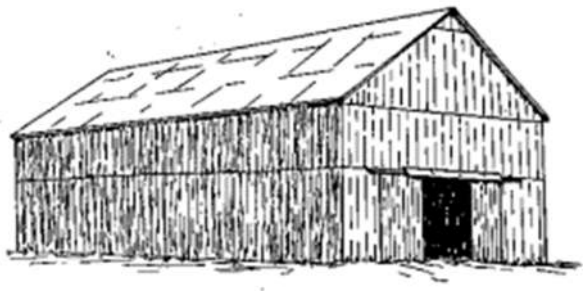


Figure 2.1.19. Transverse Frame Barn, (Noble, *Wood, Brick and Stone, Vol 2: Barns and Farm Structures,* 10.)

[93] Alan Noble, *Wood, Brick, and Stone, the North American Settlement Landscape: Volume 2: Barns and Other Farm Structures* (Athens, Ohio: Ohio University Press, 1995), 11.
[94] Alan Noble and Rudy Christian, "Historic Barns: The Barn, a Symbol of Ohio," Heartland Science, ca. 2005, https://www.heartlandscience.org/historic-barn.

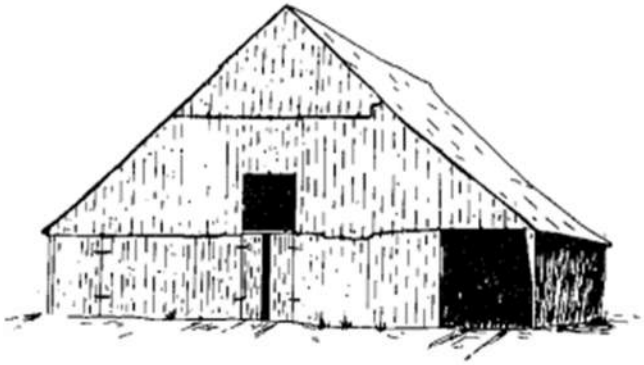


Figure 2.1.20. Midwest Three-Portal Barn. (Noble, *Wood, Brick and Stone, Vol 2: Barns and Farm Structures,* 12.)

Female Farmers

A county atlas map of Union Township that was published a few years after the barn was expanded labels the former Clark farm as the property of "Mrs. Joanna Steel"[95] (Figure 2.1.21. 1875 atlas). The map includes a business directory for each township; Joanna Steel is one of just two women on that list—both were farmers.[96] The map records sixteen other female landowners who were not included in the directory. That represents a marked increase in female ownership since 1860. The 1860 atlas map of Union Township records just five female property owners, and there were only five female farmers in the agricultural census that year as well. That increase is probably due in part to women inheriting land from husbands and fathers who died in the Civil War. It had also been long enough since the Virginia Military District was settled that farms created by the first white settlers (who were all men) had changed hands.

[95] Gould, *Illustrated Atlas of Ross County and Chillicothe, Ohio, 1875,* 73.
[96] The other farmer is Charity Heath, who lived near the town of Yellow Bud to the north.



Figure 2.1.21. 1875 Ross County Atlas Map. Joanna Steel's Farm is highlighted. A red dot indicates the barn, and the square indicates a house. Underlined names indicate family members. (*Illustrated Atlas of Ross County and Chillicothe, Ohio,* Columbus, OH: H. T. Gould and Co., 1875, 73.)

That 1875 map shows that Joanna Steel was close to family members. The farm directly east of her land was owned by John S. Steel. Although John Steel (1838-1918) was not directly related to her husband, George C. Steel, or her former father-in-law, George Steel, he was about the same age as the younger man and may have been a cousin.[97] And, her paternal grandfather, Joseph W. Clark, had a nearly 300-acre farm just two farms east of John Steel's property.

The atlas map also shows the path of the Marietta and Cincinnati Railroad, which came through the area and the Steel farm in 1851. That line ran just north of the house and barn, between them and the Frankfort-Chillicothe Road.[98] In 1878, the Cincinnati, Hamilton and Dayton Railroad built another line that ran just south of the farmstead. Those two rail lines bracketed the farmstead well into the mid-twentieth century. The southern line was removed between 1971 and 1997, and the northern right-of-way now houses a paved multi-use recreation trail.

Day to day farm operation does not appear to have been heavily affected by the railroads, and Joanna Steel ran the farm into the late 1870s or early 1880s. She was still living there when the 1880 population census was made, along with her 20-year-old son Willam and 16-year-old daughter Carrie. Her longtime servant, Elizabeth (Lizza) Richards, 65, was still part of the household. Joanna was still listed as the head of the household. The census record did not include an occupation for her, but it is likely she was still running the farm.

[97] "Public Member Trees," *Ancestry.com*, William C. Clark (1802-1843), and "John S. Steel," *Find a Grave*, https://www.findagrave.com/.
[98] *History of Ross and Highland Counties, 1880, 156.*

Joanna Steel died in 1888, leaving the property to her son and daughter. Carrie Steel had married by then and was listed as Carrie Cox in probate records. An inventory of Joanna Steel's personal property that was made shortly after her death shows that she had a well-finished house, which is not surprising considering she inherited her parents' estate and appears to have been living in the same house in Union County for at least twenty years. In addition to the usual household goods, the inventory notes a library and several portraits and pictures. Two items on the list illustrate her attachment to the farm: there was a "Picture of the residence" and a "Survey of farm framed."[99] The inventory included only three items related to operating the farm: 2,568 Bushels of corn, a note about a blue grass pasture bill, and 17-1/2 acres of "growing wheat."[100]

In 1889, more than fifty years after Joanna Steel's parents bought the farm in Union Township, her children sold the property to Mordecai Cloud Hopewell for $16,000.[101] That sale included 256.89 acres in Union Township plus 4.11 acres in Twin Township. That deed referenced a survey of the Union Township parcel that was made by W. E. Strong in 1879, which is most likely the survey Joanna Steel had framed and hanging on her wall when she died. That survey has not been found.[102]

Summary of Appearance in 1888, at the end of Episode 2.

Plan and Shape: In 1888, the expanded barn had the same general form and footprint that it has today. The original core of the building was open and edged with waist-high walls of vertical planks. The new bays were largely open, with some animal pens.

Roof: Unknown, but likely the existing standing seam metal roof.

Exterior Walls: Unknown. The siding may have been made of vertical boards with battens. The date of the current boxcar beaded siding is likely not from 1868, as it is installed with round nails.

Doors and Windows: There were probably three doors on the east wall and one on the north. On the east wall, the two end bays had wagon doorways, and the center bay had a single doorway. There is no evidence of the type of doors in those openings. The current north door is a sliding wagon door constructed of the same car siding as the walls.

Interior Finishes: Almost all original siding in the ca. 1831 section had been removed. It is possible that some original siding remains in place in the upper west gable end, which is currently inaccessible due to structural issues. The original part of the barn still had a wood floor, and the waist-high wall was in place on three sides of that floor. Feed racks for the new side bays were hung on that short wall. All parts of the addition had dirt floors.

[99] Ross County Probate Records, Case #10519, Joanna C. Steel, 1888.
[100] Ross County Probate Records, Joanna C. Steel.
[101] Ross County Deed Records, Book 107, p 41, 1889.
[102] It was not at the Ross County Recorder's Office or the Ross County Historical Society.

Episode 3. M. C. Hopewell, Archeological Investigations, and Continued Agricultural Use: 1889-1973

Episode 3 covers almost a century of agricultural use that followed the death of Joanna Steel. Mordecai Cloud Hopewell bought the property in 1889, and it remained in his family until 1928. From late 1891 through early 1892, archeologist Warren K. Moorehead led excavations of earthworks at the farm. Following standard practice in the late nineteenth century, the Hopewell culture was named after the property owner of a site that was archetypical of broader archaeological patterns, which, in this case, was farmland owned by M. C. Hopewell. Hopewell was a prominent citizen of Chillicothe who owned most of what is now called the Hopewell Mound Group from 1889 to 1903. The Hopewell family never lived on the farm; it was an investment property that was operated by tenant farmers. M. C. Hopewell's heirs sold the property in 1928, and the land and barn remained under private ownership until the early 2000s. Episode 3 ends in 1973, with the National Register designation of the complex and the beginning of National Historical Park development. The Carson-Steel Barn saw no major additions during this period.

M. C. Hopewell was living in Chillicothe with his family when he bought Joanna Steel's farm, and they were still living there when archeologist Warren K. Moorehead visited the area to study earthworks in the region in 1891. Inspired by the earlier work of Squier and Davis, Moorehead arrived at the Hopewell farm in August 1891 and led excavations at the site into 1892 (See Figure 2.1.22). That work was done in preparation for an exhibit at the World's Columbian Exposition. Moorehead wrote in 1922 that "Squier and Davis had spoken at considerable length of the importance of this group of mounds…and it was my firm conviction that here we would find one of the principal if not actually the largest, settlement of the Scioto Valley mound-building tribe."[103] That belief proved to be accurate, and artifacts collected during that trip "attracted the attention of thousands of visitors at the Exposition."[104] Moorehead began using the name Hopewell for the site to reflect the current landowner, and in 1906, the archeological culture was officially named Hopewell.[105] The site and the culture that created the earthworks have been known as Hopewell ever since.

M. C. Hopewell and his family never lived on the farm in Union Township.[106] At some point, he also purchased the former John S. Steel farm adjacent to Johanna Steel's property, and he still owned that land when he died in 1903.[107] Both farms appear to have been operated by tenant farmers. In 1900, for example, W. C. Hopewell, his wife Ella R. M. Hopewell, and her brother Willie Moore were living on East 4th Street in Chillicothe's Ward 5, and the local paper noted that

[103] Warren King Moorehead, et. al., *The Hopewell Mound Group of Ohio* (Chicago: Chicago Press. 1922), 80.
[104] Moorehead, *The Hopewell Mound Group,* 80.
[105] Wiliam C. Mills, "Baum Prehistoric Village," *Ohio Archeological and Historical Quarterly Volume XV, 45-140.*
[106] "Mystery Surrounds Mounds," *Chillicothe Gazette*, 1993, 13.
[107] Ross County Probate Records, Case #11535, Mordecai Cloud Hopewell.

David Pettiford was living on the "Hopewell farm, near Sulphur Lick Springs…"[108] Another article published in 1910 described "a four-room tenant house on the Hopewell farm near Anderson Station," occupied by Sam Long and his wife that was destroyed by fire.[109]

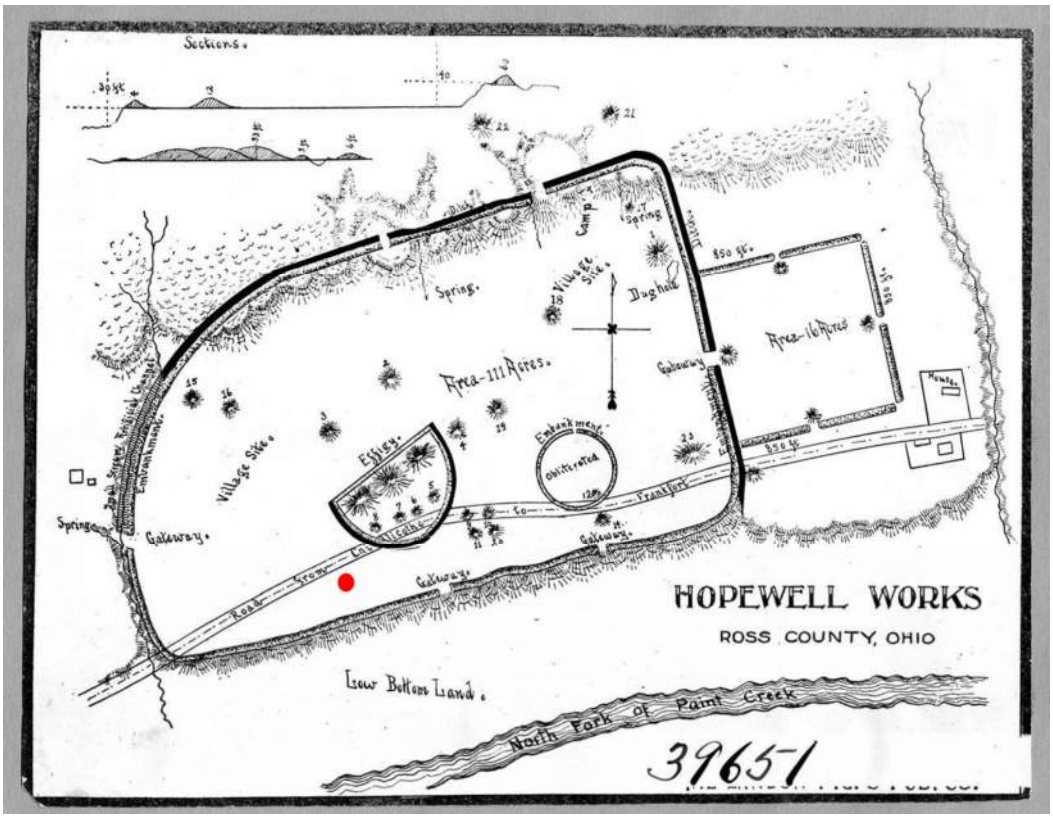


Figure 2.1.22. Map of what is now Hopewell Mound Group, by William K. Moorehead, 1897. The red dot indicates the barn location. (Hopewell Site Collection, Field Museum, Chicago. http://hopewell.unl.edu/albums/hopewell44/#page/0/mode/1up.)

Tenant farming was a relatively common practice around the turn of the twentieth century. Tenants often farmed "on the halves," living on and working the farms and splitting proceeds with the landowners. A 1920 description of the practice in Ross County noted that the typical tenant furnished "labor, implements, teams and often fertilizer," and they were also responsible for getting the crop to market.[110] That crop was most likely corn or wheat. Corn was the prominent crop in the county at the time, followed by wheat.[111]

Hopewell left most of his estate to his wife Ella, including their house in Chillicothe and the property described in his will as "...two farms situate in Union and Twin Townships…one of which contains 261 acres known as the Joanna Steel farm and being the same farm purchased

[108] *Chillicothe Gazette*, June 21, 1900; the Hopewell house in Chillicothe is still standing.
[109] "Tenant House on Hopewell Farm Burned," *Chillicothe Gazette*, Arp 8, 1910, 1.
[110] "Where Does Tenant Get Any Place," *Chillicothe Gazette*, Sept 24, 1920, 1.
[111] Henry H. Bennett, ed., *The County of Ross: A History of Ross County, Ohio* (Madison: Selwin A. Brant, 1902), 134-135.

by me from the heirs…of Steel."[112] The farms appear to have remained active under her ownership. An article written in 1924 noted that plowing at the "Hopewell farm near Anderson" uncovered artifacts believed to be associated with a "local Moundbuilder."[113]

The property was being farmed in the early 1920s, when additional excavations were conducted by Henry C. Shetrone of the Ohio State Archeological and Historical Society. Shetrone's work has been described as "the authority on the Hopewell Mound Group."[114] Those investigations also revealed the damage to the earthworks due to continued farming; many of the earthworks that had been visible in Moorehead's time had been nearly obliterated by repeated plowing. Shetrone's visit also produced photos of the Hopewell farm, including a rare photo of the Carson-Steel Barn and the overall farmstead. Those photos show the Carson-Steel Barn and the nearby house, as well as a larger frame barn east of the house that was probably built in the late 1800s or early 1900s. Of that group, only the Carson-Steel Barn remains standing (See Figures 2.1.23 and 2.1.24).



Figure 2.1.23. View of the farmstead, looking south. The later barn is on the left, and the Carson-Steel Barn is on the far right. The house is behind the trees, between the barns. (Photo by Henry Shetrone, ca. 1922. Courtesy of the Ohio History Connection. Ohio History Connection Archaeology Photograph Collection AV 17; Box 3, Folder 4, Envelope 6.)

[112] Ross County Probate Records, Mordecai Cloud Hopewell's Will.
[113] "New Mounds are Discovered and New Graves are Opened," *Chillicothe Gazette*, Mar. 20, 1924
[114] Tina Bishop, et. al. *Hopewell Culture National Historical Park: Cultural Landscape Report,* 2-45.



Figure 2.1.24. Detail of ca. 1922 photo above. (Courtesy of the Ohio History Connection. Ohio History Connection Archaeology Photograph Collection AV 17; Box 3, Folder 4, Envelope 6.)

Ella R. Hopewell died in 1938. She had no children, and her will directed that the Union Township farms be sold, with the proceeds going to relatives of her husband and various charities.[115] The Carson-Steel Barn and the original farm were sold along with other land in the area to James and Rose Accord a year later.[116] The property continued to be farmed after that sale, as shown in an aerial photo taken in 1934 (Figure 2.1.25).

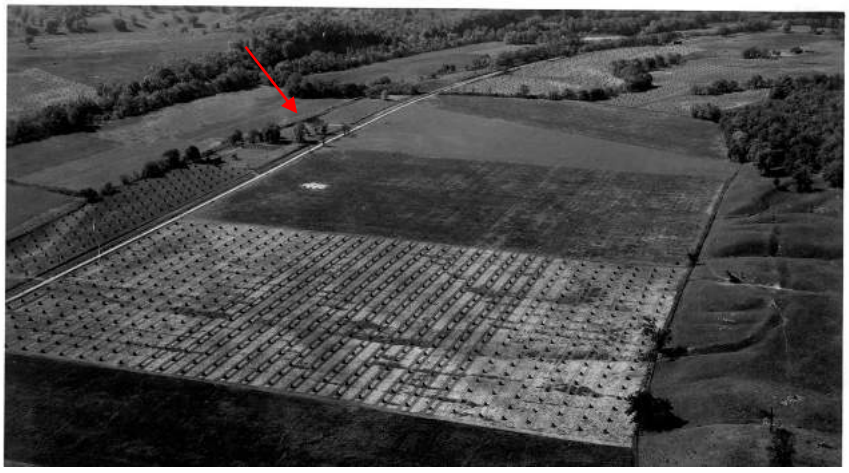


Figure 2.1.25. Aerial view of the Hopewell farm taken ca. 1934. The red arrow marks the Carson-Steel Barn. (Hopewell Site Collection, Chicago: Field Museum, http://hopewell.unl.edu/albums/hopewell44/#page/0/mode/1up.)

[115] *Chillicothe Gazette*, Nov. 18, 1938; Ross County Probate Records, Case #21942, Ella Hopewell, 1938.
[116] Ross County Deed Records, Book 256, p. 369.

The land remained in the Accord family into the late 1960s, when it was sold to Richard and Marjorie Johnson, who owned it into the 1970s. Topographic maps made in 1944 and 1961 show few changes to the farmstead, which included the Carson-Steel Barn, house, and a newer barn.[117] By the early 1970s, growing recognition of the earthworks spurred a nomination of the entire Hopewell Mound Group to the National Register of Historic Places. The process began in 1973, and the property was officially added to the National Register in 1974 for archeological significance. That short document nomination did not mention the Carson-Steel Barn or any other buildings, and no photos are included in the site file. The document reflected the growing interest in the preservation of the property, closing with a note that the "area should be protected at all cost against cultivation, road and railroad construction…and other detriments to the site."[118]

[117] US Geological Society, "Ross County, Ohio." Topographical Maps, Roxabell and Chillicothe West Quadrangles, (Washington, DC: US Geological Survey, 1912-2023). Accessed February 2024. https://ngmdb.usgs.gov/topoview/viewer/#15/39.3589/-83.0881

[118] Elizabeth Scheurer, "Hopewell Mound Group; National Register Nomination Form," (US Department of the Interior, National Park Service, 1973.)

Summary of Appearance in 1973, at the end of Episode 3.

Plan and Shape: The barn saw no notable changes to form or footprint during this episode. The original core of the building was open and edged with a waist-high wall of vertical planks. The side and back bays were largely open, with some animal pens.
Roof: The standing seam metal roof that is on the barn today has been in place since at least 1922, the date of an early photo of the building. (Figure 2.1.24 above.)
Exterior Walls: The presence of round nails on the existing vertical v-joint tongue and groove board siding indicates it was likely installed after 1889. It was in place by 1922.
Doors and Windows: All doorways from the previous episode were still in use. All appear to have had vertical v-joint plank doors, like the door still in place on the north wall. Small windows on the north and south walls were added after 1922, in the last part of this episode or early in the next.
Interior Finishes: The original part of the barn still had a wood floor, and the waist-high wall was in place on three sides of that floor. Feed racks for the side bays were still in use. All or most floors in the 1860s section were probably bare dirt.

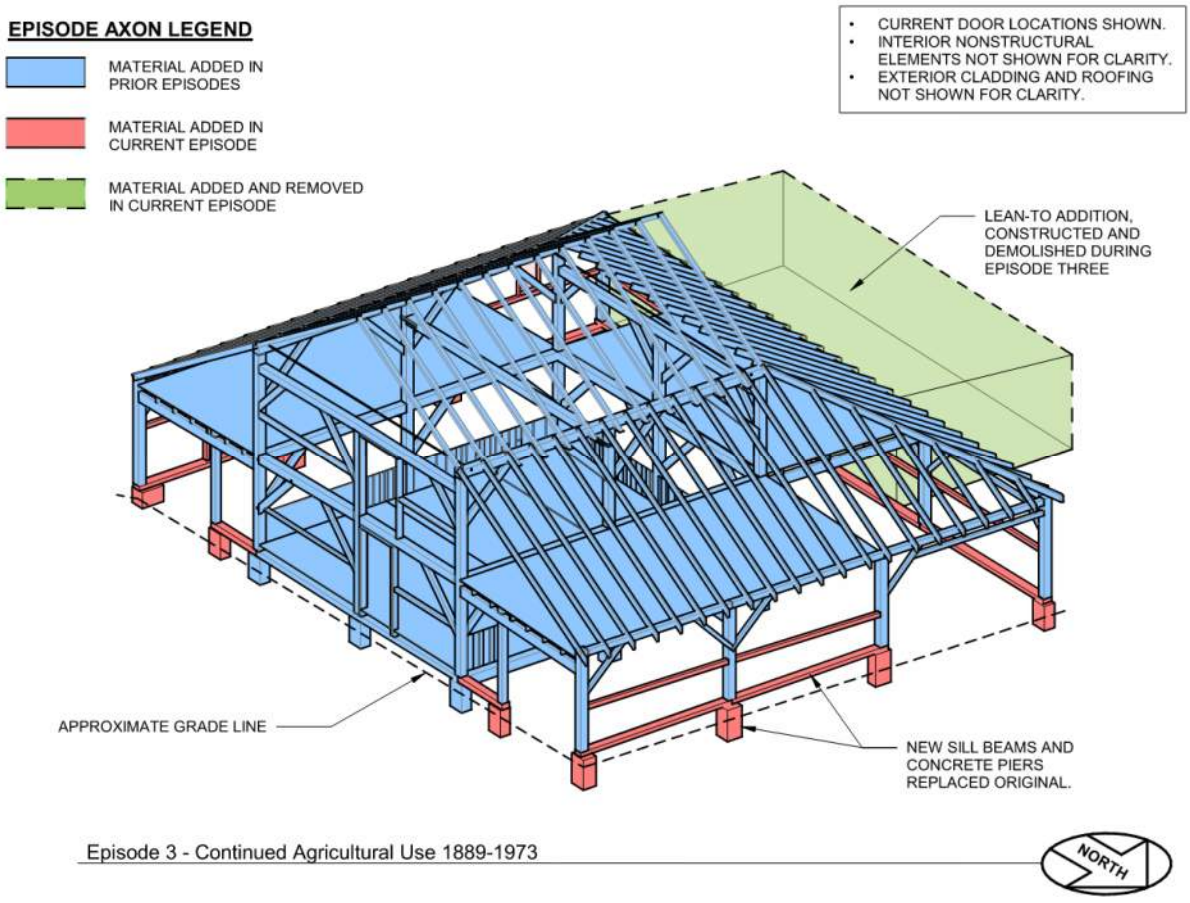


Figure 2.1.26a. Axonometric View of the Carson-Steel Barn during Episode Three, excluding cladding and roofing. (STRATA 2024)

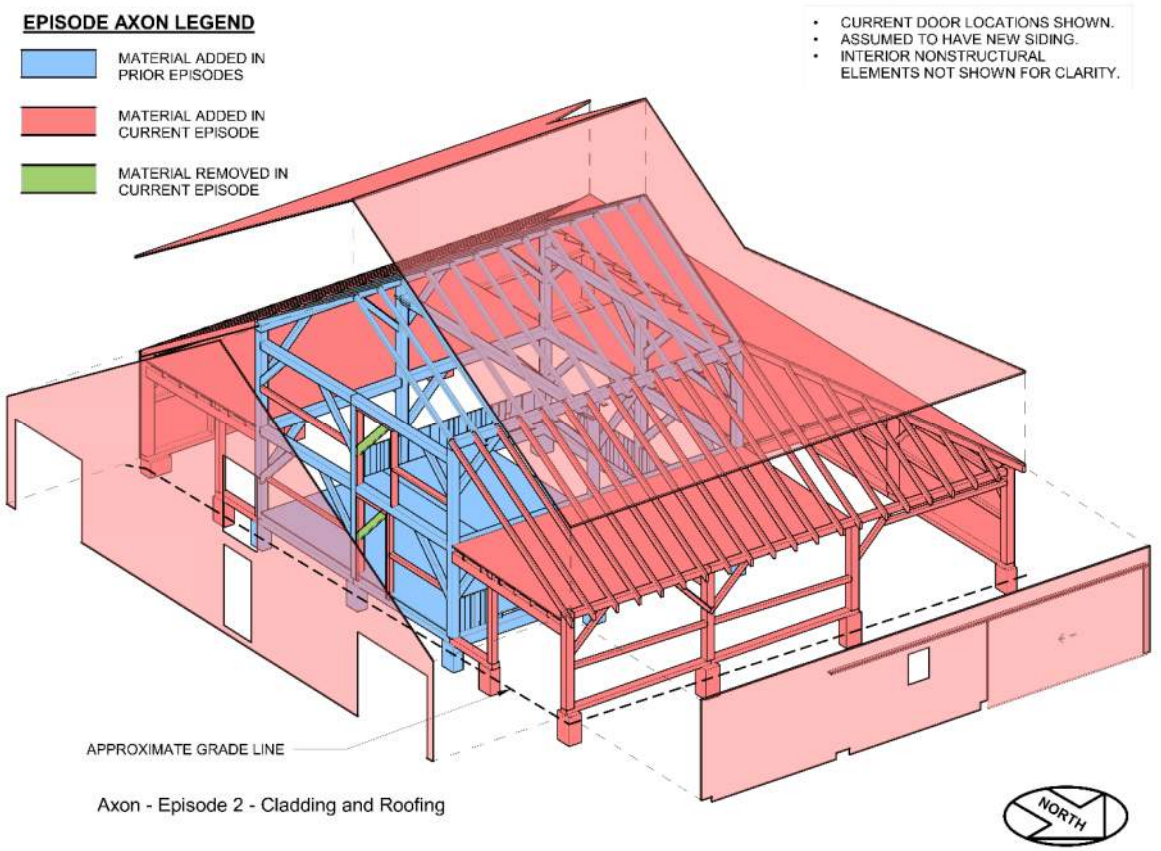


Figure 2.1.26b. Axonometric View of the Carson-Steel Barn during Episode Three, including cladding and roofing. (STRATA 2024)

Episode 4. National Park Development: 1974 - Present

The Hopewell Mound Group was listed in the National Register of Historic Places in 1974 as a National Historic Landmark with archeological significance. Although public and semi-public organizations began purchasing land in the Hopewell Mound Group to ensure its preservation soon after that, the Carson-Steel Barn remained under private ownership until the twenty-first century. The Hopewell Culture National Historical Park, which includes the Hopewell Mound Group, was established in 1992, and the National Park Service acquired the parcel of land that houses the Carson-Steel Barn in 2002. The barn has been used only for storage since that time.

Laying the Groundwork for Public Ownership

Growing recognition of the earthworks spurred efforts to protect important properties from the types of damage noted in the 1970s National Register nomination. Those dangers included continued degradation from farming and the construction of new buildings. A 1980 site survey of the Hopewell Mound Group conducted by Dr. Mark Seeman of Kent State University, for example, showed that only portions of the wall and adjacent ditch on the north side of the enclosure earthwork were still intact. As noted above, the Carson-Steel Barn site is close to the south wall of the enclosure. Seeman was also able to accurately locate many of the mounds through aerial photography and surface survey.[119]

That same year, a non-profit organization, The Archaeological Conservancy, purchased a little more than 120 acres of the Hopewell Mound Group from private landowners.[120] That included former Hopewell farmland that was located north of Sulphur Lick Road. (See Figure 2.1.27). Sulphur Lick Road is in the same general location as the 19th-century Frankfort-Chillicothe Road. The barn property was not part of that purchase.



Figure 2.1.27. 1997 Plat Book excerpt, showing Archeological Conservancy land (in yellow) and the Carson-Steel Barn. (*Ross County Ohio: 1997 Plat Book,* Clayton Ohio: Mercury Publishing Co. 1997.)

[119] Mark F. Seeman, *An Archaeological Survey of the Hopewell Site (33Ro27) and Vicinity, Ross County, Ohio*. 1981. Report submitted to the Ohio Historic Preservation Office. On file at Hopewell Culture National Historical Park, Chillicothe, Ohio.
[120] Ross County Deed Records, Book 444, p. 43-45, 1980.

Agricultural use continued on privately owned land in the area, including the farmstead with the Carson-Steel Barn. The barn and rest of the farmstead, along with fields to the south that are outside of the earthworks, were purchased by Earl and Geneva Ray in 1976. The Rays owned the farmstead and the Carson-Steel Barn plus 75 acres of cropland when the property was mapped in 1997 (Figure 2.1.27, above).

Aerial photos taken in 1984 and 1995 provide good images of the barn and farmstead in the late twentieth century. The 1984 photo shows a small saltbox house, a gable-roofed frame corn crib, a modern house trailer, a modern one-story implement shed, and the Carson-Steel Barn (Figure 2.1.28). The house in that photo may be the brick house William Clark added to the property in 1841.[121] The corn crib was built in the late 1800s or early 1900s, and the house trailer and implement shed were twentieth-century additions.[122] The Carson-Steel Barn had a non-original lean-to addition along its west wall (Figure 2.1.29). That addition was in poor condition when the photo was taken, with missing roofing and siding in some areas.



Figure 2.1.28. 1984 Aerial photo of the farmstead. The Carson-Steel Barn is on the far right, behind the low white implement shed. (*Vintage Aerials*, "Ross County, Ohio, 1984," Film Roll 27 Photo 27-YRO-16.)

[121] *Vintage Aerials*, “Ross County, Ohio, 1984,” Film Roll 27 Photo 27-YRO-16. (Accessed 2024, https://vintageaerial.com/photos/ohio/ross/1984/YRO/27/16.)
[122] Rudy R. Christian, Memo to Sam Quackenbush, Hopewell Culture National Historical Park, Re: Corn Crib, September 2014.

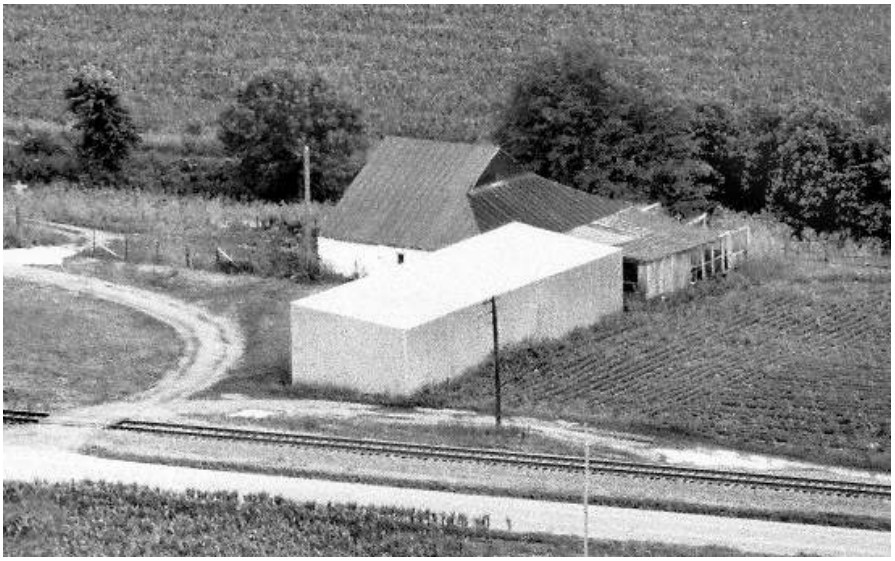


Figure 2.1.29. Detail of the Carson-Steel Barn in 1984. (*Vintage Aerials*, Ross County, Ohio. 1984 Film Roll 27 Photo 27-YRO-16. Accessed 2024, https://vintageaerial.com/photos/ohio/ross/1984/YRO/27/16.)

Another Vintage Aerials photo taken in 1995 shows a number of changes (Figure 2.1.30). The saltbox house had been replaced with the house now on the property, and the house trailer had been removed.[123] The railroad tracks visible along the side of the road in 1984 were also gone; that right of way became a recreational trail in 1999.[124] The corn crib and modern shed were still in place, as was the Carson-Steel Barn. The lean-to addition on the barn had been removed.



Figure 2.1.30. 1995 Aerial photo of the farmstead. The Carson-Steel Barn is on the far right. (*Vintage Aerials*, Ross County, Ohio. 1995 Film Roll 45 Photo 46-OXRO-32.)

[123] *Vintage Aerials*, "Ross County, Ohio," 1995 Film Roll 45 Photo 46-OXRO-32, (Accessed 2024, https://vintageaerial.com/photos/ohio/ross/1984/YRO/27/16.)
[124] Tina Bishop, et. al. *Hopewell Culture National Historical Park: Cultural Landscape Report,* 2-63.

Hopewell Culture National Historical Park

On May 27, 1992, the Hopewell Culture National Historical Park was established via federal legislation "to protect the prehistoric remains of a dynamic social and ceremonial phenomenon that flourished in the woodlands of eastern North America long before Europeans first landed on this continent."[125] The new park boundaries included private and publicly-owned land in several sites, including the Hopewell Mound Group, and the Park Service was authorized to acquire land within the boundaries as funding became available. One of the first federal purchases at the Hopewell Mound Group came in 1997, when the National Park Service bought land from The Archaeological Conservancy.[126]

The barn and farmstead remained in private ownership until 2003, when the National Park Service acquired 25.29 acres (NPS Parcel 102-5) from Earl and Geneva Ray.[127] That parcel includes the Carson-Steel Barn but excludes a 1.075-acre tract that contains the Ray house and outbuildings—the east side of the farmstead shown in the 1980s and 90s photos above. The Ray family still owns the smaller tract, and the fields south of the barn are still under cultivation.



Figure 2.1.31. 2024 Ross County Assessor map, showing the outline of NPS parcel 102-05, which includes the Carson-Steel Barn but not the nearby house. The red arrow indicates the barn.

National Historical Park development brought additional study of the Hopewell Mound Group. Although that research was generally focused on the earthworks, historic resources were also documented. In 1994 and 1995, Willam S. Dancey of Ohio State University directed the "Hopewell Earthwork Catchment Survey," and in 1995 and 96, a site survey was conducted to aid in boundary adjustments.[128] In 2001, archeologists from NPS and Ohio State University used magnetometry to investigate portions of the Hopewell Mound Group. That study identified

[125] *General Management Plan: Hopewell Culture National Historical Park*, Ohio," (United States Department of the Interior. Washington D.C., 1997), 2.
[126] Ross County Deed Records, Deed Book 88, p. 405.
[127] Ross County Deed Records, Deed Book 250, pp. 826 and 834.
[128] Tina Bishop, et. al. *Hopewell Culture National Historical Park: Cultural Landscape Report,* 2-61, and HOCU file #HOCU-00133.

a previously unknown circular enclosure within the main enclosure and archaeological features that demonstrate long-term use of the landform. The study did not find evidence of Hopewell habitation within the main enclosure.[129] In 2013, the National Park Service NPS contracted Ohio Valley Archaeology, Inc. (OVAI) to complete a landscape-scale geomagnetic survey, and a 2015 partnership between NPS and the German Archaeological Institute resulted in a geomagnetic survey of almost all NPS property at the Hopewell Mound Group Unit.

Early park development also included the removal of resources that did not contribute to the archaeological setting. That included demolition of the implement shed and corn crib that were close to the Carson-Steel Barn (See Figure 2.1.32). The shed was removed in 2010, and the corn crib was removed in 2018. In 2011, Ohio Valley Archaeology, Inc. (OVAI) conducted shovel tests and geomagnetic survey of areas impacted by the demolition projects. That project, which collected some historic and prehistoric artifacts, did not include a report, but some information gathered then was included in a 2013 report on a separate study.[130] In 2017, a separate compliance project found that removal of the corn crib would have no adverse effect on historic resources, and the building was demolished soon after.[131] The newer house on the east side of the farmstead, which is still private property, was not impacted.





Figure 2.1.32. Agricultural buildings near the Carson-Steel Barn. Left, Implement Shed, looking southwest; demolished in 2010. (Memo: "Proposed Demolition of Dilapidated Farm Building (Small Barn) at Hopewell Mound Group, National Register Evaluation and Assessment of Effect," Hopewell Culture National Historical Park, 2017.
Right: Corn crib, looking southwest; removed in 2018. (Rudy R. Christian, Memo to Sam Quackenbush, Hopewell Culture National Historical Park, Re: Corn Crib, September 2014.)

[129] Tina Bishop, et. al. *Hopewell Culture National Historical Park: Cultural Landscape Report*, 2-26 and 2-65.
[130] Jarrod Burks, *Large Area Magnetic Gradient Survey at the Hopewell Mound Group Unit, Hopewell Culture National Historical Park, Ross County, Ohio* (Columbus, Ohio: Ohio Valley Archaeology, 2013), and correspondence with Tim Everhart, PhD, Acting Director, Resource Stewardship, Hopewell Culture National Historical Park, October 2024.
[131] Kathy Brady, “Assessment of Actions Having an Effect upon Historic Properties: Proposed Demolition of Small Barn/Corn Crib at Hopewell Mound Group-PEPC ID: 72810,” May 2027, HOCU Archives.

Carson-Steel Barn

Although a Cultural Landscape Inventory made ca. 2008 stated that the Carson-Steel Barn was scheduled for demolition in 2009, its unusual framing system spurred additional study instead.[132] Local barn experts Tom O'Grady and Dan Troth visited the barn in 2011; field notes from that visit on file with the park show that they recommended the building be dismantled and stored, and that dendrochronology be utilized to establish a construction date.[133] In 2014, historic barn expert Rudy Christian assessed the barn and corn crib. The barn was the only building identified as historically significant, and the corn crib was demolished in 2018. Christian, who has thirty years of experience with historic barns, noted that few extant buildings combined Scribe Rule and Square Rule framing methods and stated that "a great deal more study is needed to better understand this structure's place in Ohio's history."[134]

The barn was also discussed in the 2016 document *Hopewell Culture National Historical Park: Cultural Landscape Report and Environmental Assessment*. Although the report noted that none of the buildings within the legislated boundary of the Hopewell Mound Group were considered significant to the archeological landscape, the Carson-Steel Barn (called the Hopewell barn in that document) was described as significant in other areas. The report called it a significant example of the "architectural and agricultural history of Ohio" that was "in need of immediate stabilization."[135] In 2021, the National Park Service prepared a scope of work for stabilization of the barn, but the barn was in such fragile condition that they were unable to identify contractors qualified or willing to do that work.

The 2016 CLR also noted that the barn may be significant "based on age and non-traditional carpentry construction." At that time, the barn was believed to have been built in the late eighteenth or very early nineteenth century. Dendrochronology testing conducted in 2023 found that estimate to have been several decades too early, with the oldest section dating to ca. 1831. The dendrochronology was done as part of this Historic Structure Report, which is the first in-depth study of the barn to date. Work on the Historic Structure Report also included an Eligibility Assessment that was submitted to the Ohio Preservation Office in 2024. The Eligibility Assessment yielded a response that the barn was potentially eligible for the National Register for local significance in the area of Architecture.

Unfortunately, additional study and building assessment have revealed deterioration of the timber framing that is so widespread that the building would likely not qualify for the National Register if all needed repairs were to be completed. The metal roofing and painted wood siding are both at the end of their useful life and would need to be replaced entirely to keep the barn in

[132] *Cultural Landscapes Inventory: Hopewell Mound Group,* National Park Service: Hopewell Culture National Historical Park, ca. 2008, 15.
[133] Tom O'Grady and Dan Troth, "Evaluation Notes Hopewell Mound Group Barn," 2011, HOCU files.
[134] Rudy R. Christian, Memos to Sam Quackenbush, Hopewell Culture National Historical Park, March and September 2014, 4.
[135] Tina Bishop, et. al. *Hopewell Culture National Historical Park: Cultural Landscape Report, 3-109.*

service. Inside the building, an estimated 50% to 60% of the framing members would have to be replaced due to extreme deterioration. Several major structural supports have already failed, and the vacant building is currently not safe to use, even for storage.

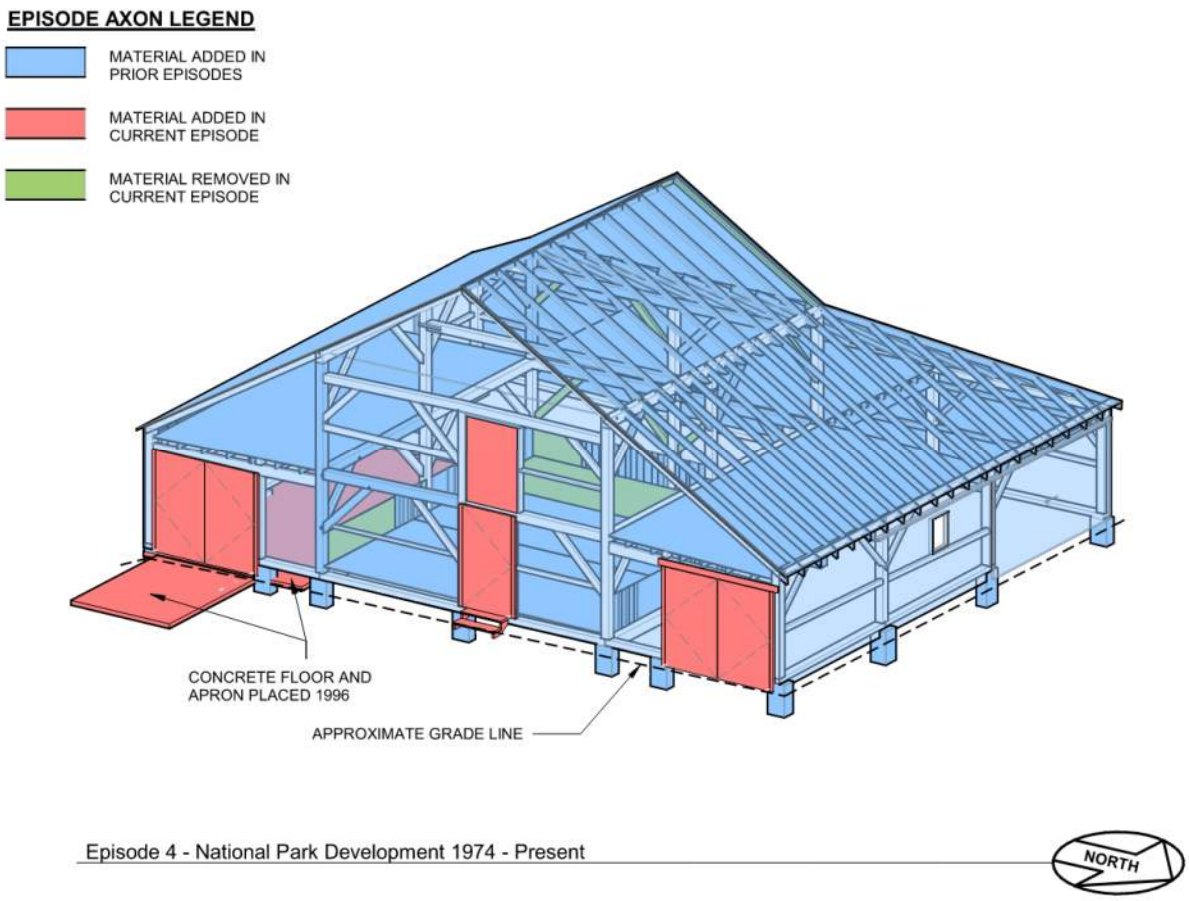


Figure 2.1.33. Axonometric view of the current condition of the Carson-Steel Barn. (STRATA 2024)

2.2 Architectural Context

Introduction

Built just a few decades after Ohio became a state, the Carson-Steel Barn is an unusual barn. It features distinctive characteristics of two different methods of heavy timber framing that were in use at the time: Scribe Rule and Square Rule. The Scribe Rule method of timber framing, which required the services of at least one master carpenter, developed in England and Europe in the 1200s and was used in the American colonies and the United States into the first half of the 1800s. The less technical Square Rule method developed in the United States around 1800, and by the mid-1800s, it had almost completely replaced Scribe Rule. The Carson-Steel Barn was built during that transitional period, providing a good example of both framing techniques. The first part of this chapter provides an overview of those framing methods, including a description of other surviving Scribe Rule barns.

The original barn has an unusual form. Its square plan, unusually high gabled roof, and open interior were unlike most other Midwest barns of the period. Although it has many characteristics typical of barns its age, a review of common vernacular barn types and surviving early to mid-nineteenth-century barns failed to identify another barn type or surviving building like it. After the ca. 1868 expansion, the barn became a good example of the Midwest three-portal barn, a very popular barn type that can still be found across the Midwest.

The second part of this chapter compares the Carson-Steel Barn to recognized barn types and surviving Midwest barns built in the same period. The study group for that comparison included Scribe Rule barns listed in the National Register and Ohio barns of any type built before 1870, focusing on Ross County examples and Ohio barns listed in the National Register. That second group includes still-extant barns located within a few miles of the Carson-Steel Barn.

Elaboration

Timber Framing Methods

When the oldest section of the Cason-Steel Barn was built, timber was plentiful, but sawmills were rare. There were few sawmills in the area, and those that did exist were water-powered, which meant production fluctuated according to water levels, and flood damage was all but inevitable. The first mill in what is now Ohio was constructed in 1789, about 15 miles from Marietta on Wolf Creek.[136] Like most early mills in the region, the Wolf Creek mill processed both grain and timber, with grain as the primary product.

One of the first sawmills in Ohio was constructed in 1798 on the North Fork of Paint Creek, but it appears to have been long gone by the time Carson's new building was being constructed. That sawmill was built by Thomas Worthington, who had to rebuild it just a few years later due to

[136] Tom O'Grady, "Early Mills in Southeast Ohio," Southeast Ohio History Center, February 14, 2024. https://southeastohiohistory.org/author/tom/.

flood damage. He built the mill to furnish lumber for his large stone house, Adena, which was completed in 1807, and it does not appear to have operated long after the project was completed.[137]

Worthington's sawmill was an outlier; by 1820, there were just 170 sawmills in the entire state.[138] That number grew rapidly over the next two decades, but milled lumber would still have been scarce in Union Township when the Carson building was constructed. With immense stands of native timber, however, raw building materials were plentiful, and rural landowners simply harvested trees from their own land. Trees were generally cut close to the building site to minimize the distance the lumber had to be hauled, and the logs were rough-dressed in the woods to reduce the weight of the materials being moved.[139]

When the first section of the Carson-Steel Barn was constructed, builders had to fashion all or most components for a wooden building with hand tools.[140] That process began with felling trees, using a felling axe, which resembled the modern-day American axe. After the branches were removed, the trunk was cut into useable lengths, and the builder(s) used a string line to mark a straight line for the edge of the finished timber. Angled scoring cuts were then made along the string line. Using a broad axe, which is offset to one side, the builder shaved or "hewed" a flat side into the log, chopping the score marks away and creating a straight edge matching the string line[141] (Figure 2.2.1). That process was done four times to create a square or rectangular timber. Scoring marks from that process can still be seen on many of the Carson-Steel Barn's framing timbers (Figure 2.2.2).

Once the timbers were squared, they were ready to be cut and assembled using mortise and tenon joints secured by wooden pegs. A mortise is a hole cut into a timber to receive a tenon. A tenon is a projecting end of a piece of wood cut to fit into a mortise.[142] Scribe Rule and Square Rule both use mortise and tenon joints; the primary difference lies in how those joints are designed and assembled.

[137] Donald A. Hutslar, “Ohio Water Powered Sawmills,” *Ohio History Journal,* accessed September 18th, 2023. https://resources.ohiohistory.org/ohj/search/display.php?page=116&ipp=20&searchterm=Array&vol=84&pages=5-56.
[138] Hutslar, “Ohio Water Powered Saw Mills,” 13.
[139] Rudy R. Christian, Interview with Angie Gaebler, et al. Video call, May 6, 2024.
[140] Hutslar, “Ohio Water Powered Saw Mills,” 13.
[141] C. Keith Wilbur, *Homebuilding and Woodworking in Colonial America,* (Old Saybrook, CT: Globe Pequot Press, 1992, 10.
[142] Cyril M. Harris, *Dictionary of Architecture and Construction 4th ed.* (New York: McGraw Hill, 2006), 644, 986.

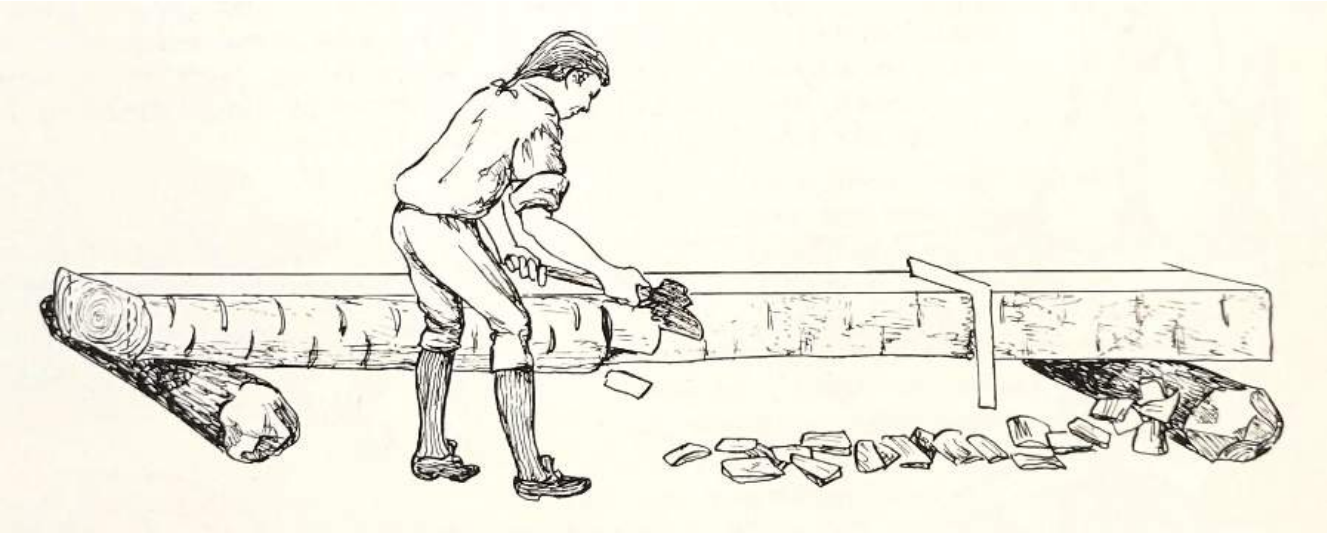


Figure 2.2.1. Squaring a Timber, Using a Broadax. (C. Keith Wilbur, *Homebuilding and Woodworking in Colonial America,* Old Saybrook, CT: Globe Pequot Press, 1992, 11.)



Figure 2.2.2. Framing in the 1830s section of the barn with remnants of the scoring cuts. (STRATA, 2023)

Scribe Rule

The use of large timbers to create a substantial shelter for protection against the elements and one's enemies is estimated to have begun around 200 BCE in Europe and the Far East.[143] By the Middle Ages, England and Europe had well-developed carpentry guild systems that supported technological advances and formal training for tradesmen. That training took years. It began with a five- to seven-year unpaid apprenticeship under a master craftsman, after which the trainee could work as a traveling journeyman. The guilds then controlled which journeymen could be designated as master craftsmen, a title that brought the ability to own tools and operate a carpentry business.[144]

Master builders had expertise in all aspects of timber construction, ranging from small dwellings and outbuildings to the vaulted roofs of major cathedrals. Expertise in joinery was critical, as builders often had to splice together smaller pieces of wood into large framing members and create structurally secure connections between irregularly shaped timbers. The master builder was generally in charge of mapping joints and scribing timbers to mark the angles and locations of cuts. After that step, less skilled apprentices and journeymen could cut the timbers and assemble the frames. Scribe Rule, as that system became known, was used in England and Europe as early as 1200 CE, and it was still followed in England and the United States in the 1850s.[145]

The guild system was still in place when the American colonies were settled but did not transfer to the new settlements. Few master carpenters were willing to give up established practices to emigrate, and the first carpenters to settle in America tended to be young men who were relatively new to the field. The carpentry trade in America developed more haphazardly, with fewer master builders and little to no system for formal training. The Scribe Rule method did transfer, though, and skilled builders that could apply Scribe Rule principles were in demand in the early 1800s.

As was the case in England and Europe, Scribe Rule construction in the United States required the services of at least one master craftsman, who designed and marked each joint in the framework. That was done by laying out the timbers on the ground in the shape they were to be assembled, then mapping each face using a string line, caliper, and plumb bob.[146]

[143] Tedd Benson, et. al., *Building the Timber Frame House: Revival of a Forgotten Craft*, (New York: Charles Scribner's Sons, 1980), 2.
[144] David Leviatin, "Scribe Rule, Square Rule, Democracy and CNC," *Journal of the Timber Framers Guild,* no. 102 (2011): 3.
[145] Allison Aurand, "Timber Framing's Legacy: The History of This Iconic Style," Timber Home Living, accessed December 8, 2023, https://www.timberhomeliving.com/articles/history-of-timber-framing; Edward Shaw, *Shaw's Civil Architecture; Being a Complete Theoretical and Practical System of Building*, (Boston: John P. Jewett and Company, 1952), 116.
[146] "Timber Framing for Beginners: Introduction to Scribing 1," *Timber Framing*, No 76, June 2005, 5.



Fig. 4. Marking for joints in multiple member assembly. Timbers have been stacked in the proper orientation and carefully leveled with shims, then clamped to keep them from shifting. Upper member has been both centerlined and joint lined, lowest timber centerlined only.

TIMBER FRAMING 76 • JUNE 2005 5

Figure 2.2.3. Laying out a Scribe Rule Frame. ("Timber Framing for Beginners: Introduction to Scribing 1," *Timber Framing*, No 76, June 2005, 5.)

That process sometimes required putting together and taking apart the heavy frame multiple times before assembly to design all joints in the building.[147] Mortises and tenons were created in the corresponding timbers to create a precise fit, no matter the shape of the timbers being joined. Because each scribed joint was different, those framing members were not interchangeable; each joint was unique. Therefore, the timbers were marked with Roman numeral "marriage marks" as the joints were created, and the joints were then disassembled so that the members for the next joint could be scribed and cut.

The tight joints and marriage marks on the timbers of the original section of the Carson-Steel Barn mark it as a product of the Scribe Rule method. It was designed by a master builder familiar with what one description of early timber framing in the United States called "a highly complex and sophisticated array of structural concepts, climaxing a thousand years of English experience in building."[148]

Square Rule

Around the turn of the nineteenth century, a new timber framing method developed in the United States. Known as the Square Rule, it is a less technical method based on the principle that every piece of timber has a straight piece of smaller dimensions within the irregular timber. Only the connection points of the framing members are trimmed to those dimensions. Because all timbers for a single building could be trimmed to uniform dimensions, there was no need to

[147] Jack A. Sobon, *Historic American Timber Joinery: A Graphic Guide*, (Becket, MA: Timber Framers Guild, 2002), accessed September 2023, https://www.nps.gov/subjects/ncptt/upload/II-Tie-at-Plate.pdf, 3; Aurand, "Timber Framing's Legacy"; Shaw, *Shaw's Civil Architecture,* 116.
[148] Leviatin, "Scribe Rule, Square Rule," 2-6.

design custom joints and scribe framing members. As a result, Square Rule allowed for faster installation of the timber frames and lessened the need to learn overly technical construction methods. One modern description of Square Rule listed numerous advantages over Scribe Rule: "Many similar parts of a frame, braces for example, are interchangeable…Timbers do not need to be stacked on top of each other, scribed joints are eliminated, the frame does not need to be put together and taken apart before being erected…the speed of the entire framing process is increased dramatically."[149]

Square Rule has been described by historians as an American innovation born of necessity. American colonists had been plagued by a shortage of experienced master builders since the earliest days of settlement. There was, for example, only one carpenter on the *Mayflower*, and in 1629, a British colonist wrote home that "Of all the trades, carpenters are most needful: therefore, bring as many as you can."[150] With few opportunities for formal training in the colonies, and limited immigration of trained joiners, that shortage continued through the 1700s.[151] Historian David Leviatin noted that "Without enough master carpenters…the young (American) carpenters moved away from methods over which they had little grasp and developed new and more effective ones that enabled them to build well-made houses, barns and churches quickly."[152]

Square Rule became the standard for heavy timber framing in the United States, and by the mid-1800s, had nearly supplanted Scribe Rule.[153] However, the two methods coexisted for much of the early 1800s. The "Framing" discussion for a builder's guide published in Boston in 1852, for example, began with an explanation that "This mechanical science is divided into two principles—the Scribe Rule and the Square Rule."[154] The relative complexity of the two methods is evident in the text that follows that statement: the description of Scribe Rule is almost three times as long as the one for Square Rule.

The Square Rule method of framing was used for the 1860s additions to the Carson-Steel Barn. The framing in that part of the barn does not have marriage marks, and the joints are more irregular (Photo 5). There is also evidence that the builders of the original part of the barn were aware of Square Rule principles. Most of the joints at the top plates of the 1830s section are more typical of Square Rule than Scribe Rule. Historic barn expert Rudy R. Christian observed in a 2014 report on the Carson-Steel Barn that such a combination of joinery techniques in a single structure is very unusual for the area. He noted that the blend of methods provides "evidence that the (original) timber framer was aware of and willing to try the modern square rule system of joinery layout."[155]

[149] Leviatin, “Scribe Rule, Square Rule,” 4.
[150] Leviatin, “Scribe Rule, Square Rule,” 3.
[151] Leviatin, “Scribe Rule, Square Rule,” 4.
[152] Leviatin, “Scribe Rule, Square Rule,” 4.
[153] Leviatin, “Scribe Rule, Square Rule,” 4.
[154] Shaw, *Shaw’s Civil Architecture,* 116.
[155] Rudy R. Christian, Memo to Sam Quackenbush, Hopewell Culture National Historical Park, Re: Scribe Rule Barn (Carson-Steel Barn), April 2014, 3.

In the end, that "modern system of joinery" was much shorter lived than Scribe Rule. With the proliferation of commercial sawmills and mass-produced nails, within a few decades of the barn's expansion, heavy timber framing began to be replaced with methods that used smaller dimensional lumber. An article written by Rudy Christian in 2002 noted, "Though heavy frame timber construction has been used for nearly two thousand years, it all but vanished in this country shortly after World War 1."[156] That transition began with houses but eventually applied to barns as well.

The shift was aided in Ohio by a series of articles in the *Ohio Farmer* that promoted new barn-building techniques featuring smaller sawn structural members and more open interior spaces.[157] The iconic gambrel-roofed barn form is a product of that movement, which included the development of truss systems for gambrel roofs that were fashioned entirely from relatively small dimensional lumber. Although gambrel roofs were used on American houses from the earliest days of white settlement, gambrel-roofed barns did not come into use until the 1880s and were not common until the early twentieth century.[158]

Comparable Small Barn Types

English Barn (Three-Bay Threshing Barn)

This very common barn type is generally one bay deep and three bays wide. English barns have side-gabled roofs, with at least one wagon door in a long side wall.[159] Both side walls often have wagon doors to create a full wagon drive that often doubles as a threshing floor. Threshing floors had to be well-constructed to withstand constant pounding associated with hand-threshing of grains. As one explanation put it: "the constant use of the floor required that it be properly constructed, i.e. sufficiently supported by massive joists running perpendicular to the two-inch thick floorboards."[160] The floor in the 1830s section of the Carson-Steel Barn has all of those features. Although some of the current floorboards may be newer, the joists and sill beams appear to be original. Threshing floors were also frequently edged by short walls (waist walls) like the ones in the Carson-Steel Barn, which helped keep the loose grain in place during threshing.[161]

Locating doors at both ends of the central drive increased ventilation to help separate the chaff from the heavier grains during threshing.[162] The side bays were often used to store harvested sheaves awaiting threshing, as well as grain and straw produced during the threshing process.

[156] Rudy R. Christian, “Conservation of Historic Building-Trades Education: A Timber Framer’s View,” *The Journal of Preservation Technology* 33, no. 1 (2002).
[157] Lowell J. Soike, “Within the Reach of All: Midwest Barns Perfected,” in *Barns of the Midwest*, (Columbus: Ohio University Press, 2018), 147-148.
[158] Soike, “Within the Reach of All: Midwest Barns Perfected,” 149.
[159] Charles Caulkins and Martin Perkins, “The Three-Bay threshing Barn,” in Barns of the Midwest, 40.
[160] Alan G. Noble, *Wood, Brick, and Stone: Vol 2 Barns and Farm Structures, (*Amherst, Massachusetts: University of Massachusetts, 1984),17.
[161] Rudy Christian, Interview with Angie Gaebler, et al. May 6, 2024.
[162] Noble and Wilhem, *Barns of the Midwest*, 40-41.

The Carson-Steel Barn may have been used for threshing, but it is much taller than an English barn and only had a single bay when new. It also appears to have only had pedestrian-sized doors. There is not enough room between any of the posts and braces for a wagon door.

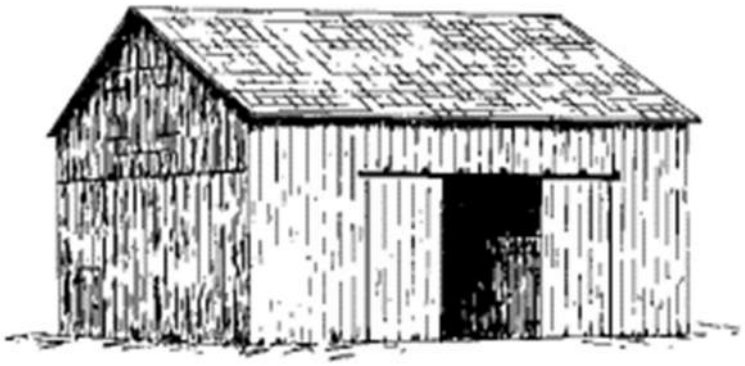


Figure 2.2.4. English Barn. (Alan G. Noble, *Wood, Brick, and Stone: Vol 2 Barns and Farm Structures,* Amherst, Massachusetts: University of Massachusetts, 1984, 17.)

Dutch Barn

When new, the Carson-Steel Barn had some features common to Dutch barns, a European barn type that was used in the northeastern US into the nineteenth century. The Dutch barn type features a steep gabled roof, with a wagon entrance in the gable end and one to three interior bays that run parallel to the ridge line (Figures 2.2.5 and 2.2.6). The barn built for Carson does currently have a gable-end entrance (not original), but it is much taller than a typical Dutch barn, and as noted above, there is not enough room between any of the posts and braces for a wagon door in the gable ends or the side walls.



Figure 2.2.5. Dutch Barn. (Alan G. Noble, *Wood, Brick, and Stone: Vol 2 Barns and Farm Structures,* 17.)

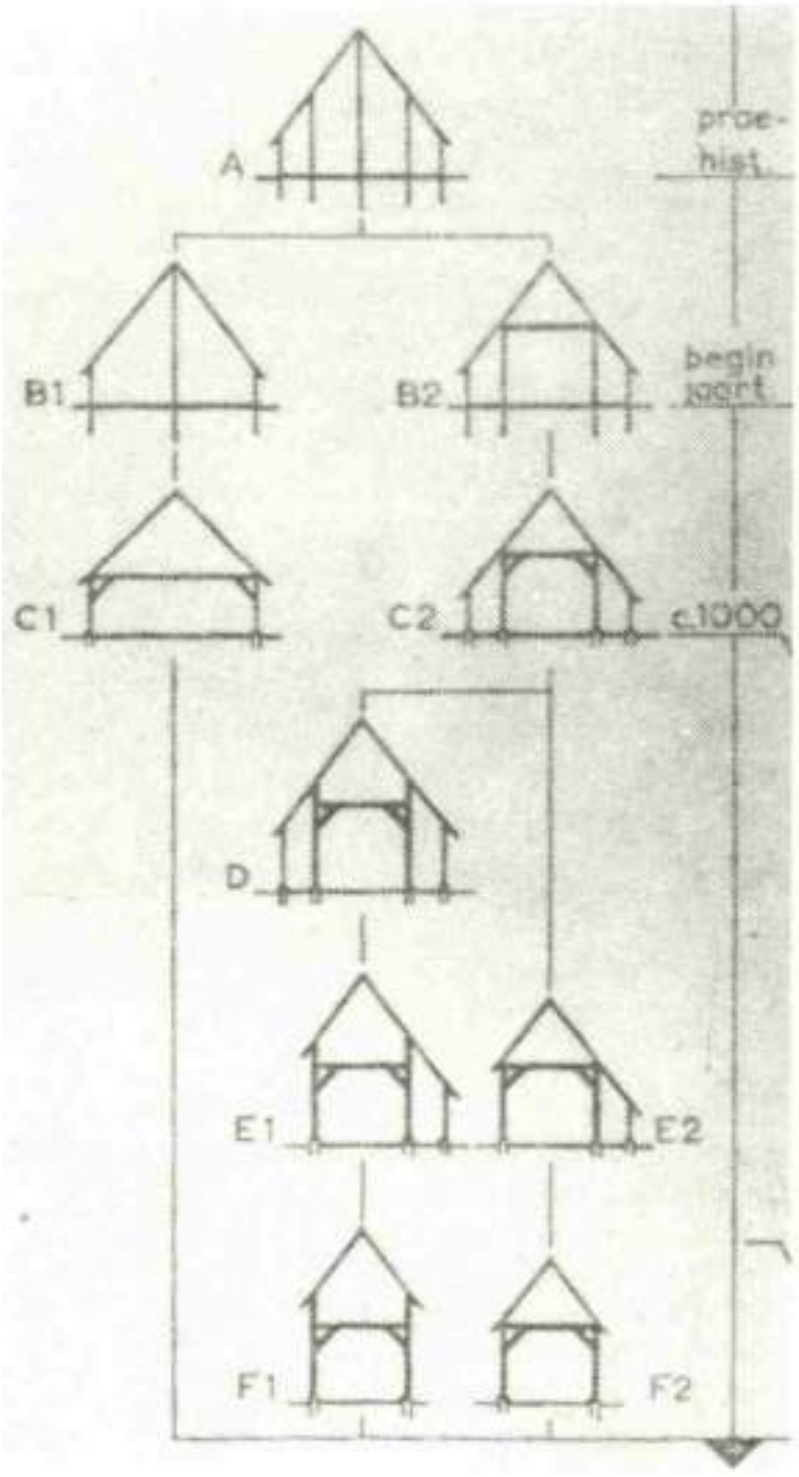


Figure 2.2.6. Common Framing Patterns for Dutch Barns. This includes a single-bay variety (F1) with framing similar to the Carson-Steel Barn, except it has no center post, leaving room for a wagon door. (Common Places, 207.)

Tobacco Barn

Like the 1830s Carson barn, fire-cured tobacco barns are frequently square and one-and-a-half- to two-stories.[163] (Air-cured tobacco barns are generally much larger.) It is unlikely, however, that the Carson barn was used to fire-cure tobacco. That process includes a smoldering fire on the floor of the barn, with smoke rising through hanging tobacco to exit through vents in the ridge and /or gable ends. The ca. 1830s rafters of the Carson barn bear no signs of smoke, and a fire at the floor level would have damaged the floor structure.



Figure 2.2.7. Fire-cured tobacco barn in Kentucky. (Rachel Kennedy and William Macintire, "Agricultural and Domestic Outbuildings in Central and Western Kentucky, 1800-1865," Kentucky Heritage Council: 1995, 26.)

Single-Crib Barn

As the name implies, a single-crib barn consists of a single crib or room, often built with horizontal log walls. The one-story barn type has a rectangular footprint eight to twelve feet wide, with a gable roof. Many have a single door in the gable end. "Crib," in this instance, has two meanings--a one-room log building, or a building or room specifically designed to store corn left on the cob.[164] Single-crib barns, in general, were used for crop or animal storage and, most frequently, for storing corn. (There is also a "single-pen" vernacular house type, which has a comparable but larger form.[165])

[163] Rachel Kennedy and William Macintire, “Agricultural and Domestic Outbuildings in Central and Western Kentucky, 1800-1865,” (Kentucky Heritage Council: 1995), 26.
[164] Noble, *Wood, Brick, and Stone,* 17.
[165] Howard Marshall, *Folk Housing in Little Dixie*, (Columbia, MO: University of Missouri Press, 1981), 39.

One author noted that the single-crib barn type may "have originally been a component of most early farmsteads" but remains in use now in limited areas.[166] The small size spurred early modifications, and most surviving single-pen barns now have one or more additions (See Figure 2.2.8). The additions, frequently constructed of lighter-weight frame walls, could be used for livestock, equipment, or additional grain processing.



Figure 2.2.8. Single-Crib Barn in Callaway County, MO. (Howard Marshall, *Folk Housing in Little Dixie*, (Columbia, MO: University of Missouri Press, 1981, 79.)

Although the 1830s section of the Carson-Steel Barn has many characteristics of the single-pen barn type, there are significant differences. At 26 by 24 feet, it is considerably larger than the typical single-pen barn. Even single-pen houses tend to be 17 to 19 feet square.[167] The size indicates that it was not built as a corn crib—even if it was built with widely-spaced siding for ventilation, it is too large to allow sufficient air movement for drying corn. It is also much taller than the average single-crib barn. Although there is no evidence that the core of the Carson-Steel Barn has ever had a second floor structure, the building is tall enough to have accommodated an upper floor.

Comparable Nineteenth Century Barns in Ross County

A pair of Ross County publications from 1875 and 1880 include images of barns and agricultural outbuildings in a wide range of shapes and sizes, but few are the size and shape of the 1830s section of the Carson-Steel Barn (Carson Barn).[168] The farmsteads, shown in Figures 2.2.9-2.2.12, each have at least one building that shares characteristics of the Carson barn. The height of the Carson barn and especially the lack of room for a wagon doorway set it apart.

[166] Noble, *Wood, Brick and Stone*, 3.
[167] Henry Glassie, *Folk Housing in Middle Virginia*, (Knoxville, TN: University of Tennessee Press, 1975), 23.
[168] Hueston T. Gould, *Illustrated Atlas of Ross County and Chillicothe, Ohio* (Columbus, Ohio: H.T. Gould & Co., 1875) and *History of Ross and Highland Counties, Ohio, Illustrations and Biographical Sketches* (Cleveland, Ohio: Williams Bros., 1880).

Buildings of approximately the same size and shape in those images generally had wagon doors, and buildings that only had pedestrian-sized doors tended to be smaller and/or shorter.

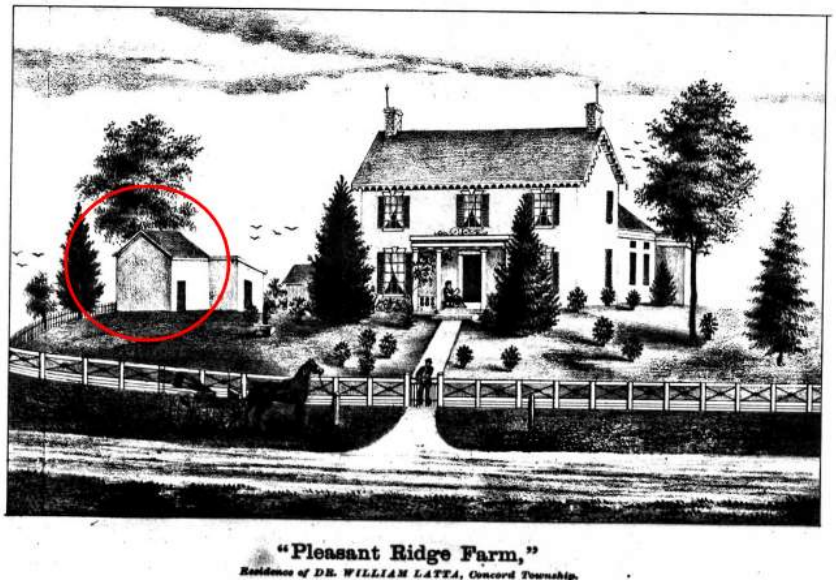


Figure 2.2.9. Pleasant Ridge Farm, Concord Township, Ross County, 1875. The proportions of the circled outbuilding are comparable, but it appears to be substantially smaller than the Carson barn. (*Illustrated Atlas of Ross County and Chillicothe, Ohio,* Columbus, Ohio: H.T. Gould & Co., 1875, 19).

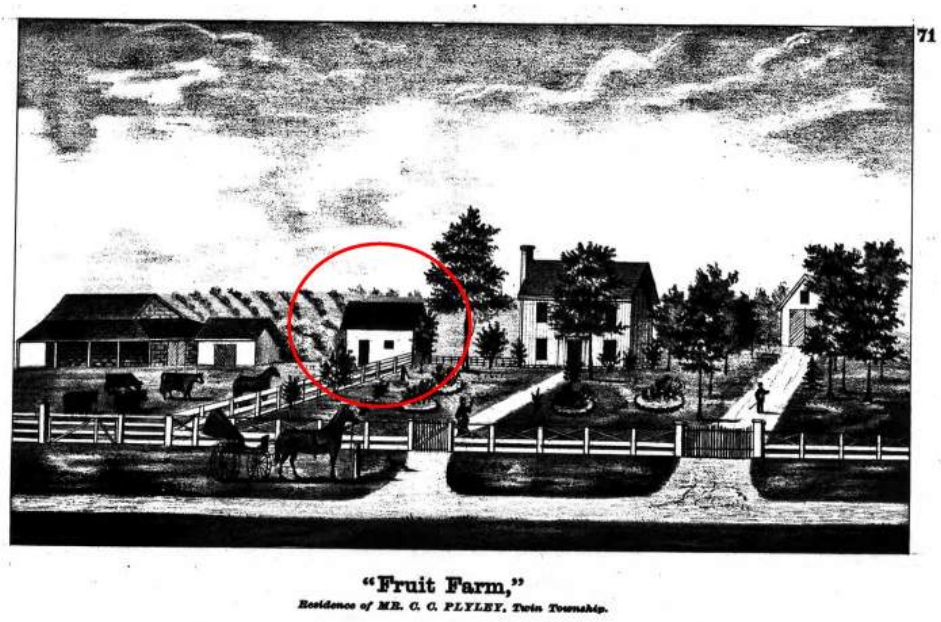


Figure 2.2.10. "Fruit Farm," Twin Township, Ross County, 1875. The Carson-Steel Barn could have originally had comparable fenestration patterns, but it is taller and larger than the circled outbuilding. (*Illustrated Atlas of Ross County and Chillicothe, Ohio,* 71).

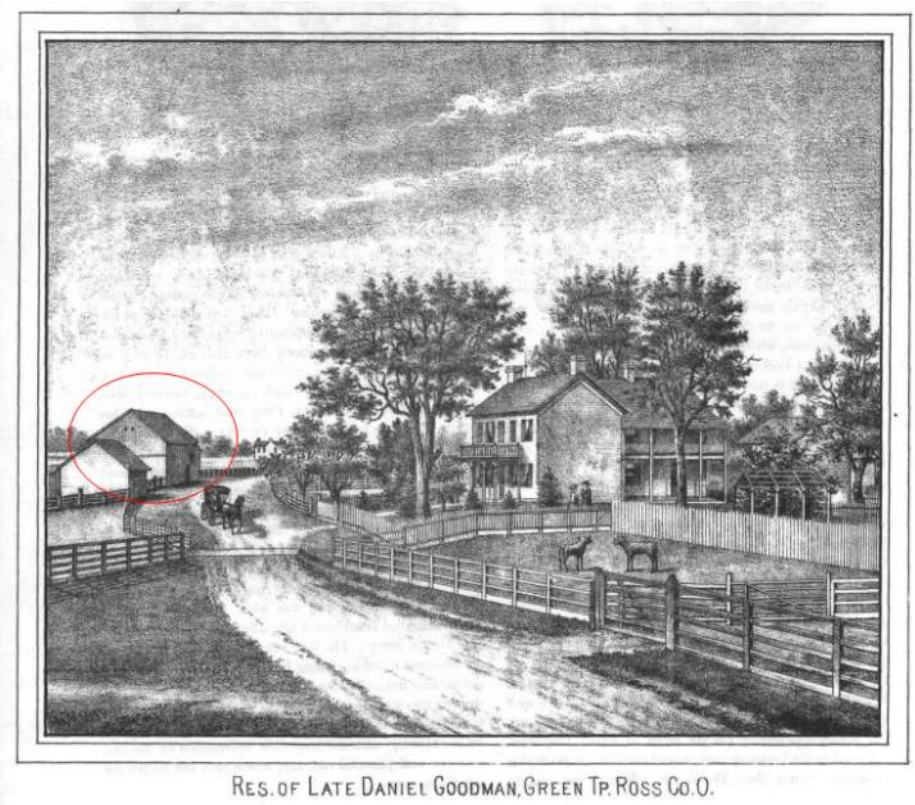


Figure 2.2.11. Goodman Farm, Green Township, Ross County, 1880. The circled barn appears to be roughly the same size as the Carson-Steel Barn, with only a pedestrian-sized doorway on the wall facing the road. Unlike the Carson-Steel Barn, it could be built into a bank, with a lower level open to the rear. (*History of Ross and Highland Counties, Ohio, Illustrations and Biographical Sketches,* Cleveland, Ohio: Williams Bros., 1880, 246.)

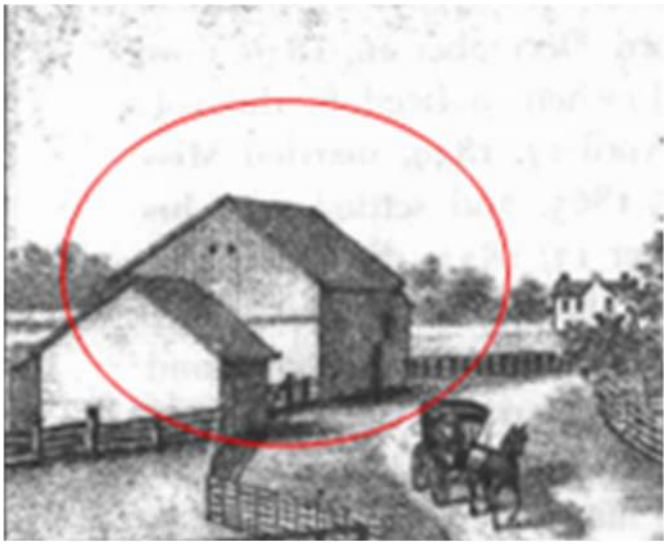


Figure 2.2.12. Detail, Goodman Farm, Green Township, Ross County, 1880. (*History of Ross and Highland Counties, Ohio,* Cleveland, Ohio: Williams Bros., 1880, 246.)

Local Barns with Comparable Forms

Many of the southern Union Township and northern Twin Township roadways were in place during the barn's period of significance--ca. 1831-ca. 1868. A windshield survey of barns along several of those roadways identified only a few early barns comparable to the Carson-Steel Barn. Because Scribe-Rule barn framing is not visible from the exterior of a building, similar properties were selected based on size, shape, and apparent age and not on framing techniques.

Although numerous gabled barns have rectangular plans in the area, few are currently close to the same size and height as the Carson-Steel Barn. Most are considerably larger. Barn additions are common, however, and some of the larger area barns may have started as smaller buildings. Of the barns reviewed in that survey, the two shown below are most like the Carson-Steel Barn as it would have looked before it was expanded in the 1860s.



Figure 2.2.13. 2179 Owl Creek Road, Twin Township. This frame barn is roughly the same size and shape as the core of the Carson-Steel Barn. The shed on the left appears to be a later addition. The low doors on the sidewall indicate that, like the Carson-Steel Barn, this heavy framing with girders midway up the walls. (Deb Sheals 2024.)



Figure 2.2.14. 3504 Owl Creek Road, Twin Township. Located a short distance from the barn above, this frame barn is slightly smaller than the study property. It is possible that the Carson-Steel Barn originally had pedestrian doors like those shown on the far left. That type of door would have accommodated foot traffic or livestock but not wagons. The shed-roofed wing on the right is probably a later addition. (Deb Sheals 2024.)

Scribe Rule Barns

Archival research indicates that Scribe Rule barns are a vanishing resource. A review of national collections such as the Historic American Building Survey and the National Register of Historic Places databases and smaller local collections identified just 17 other documented Scribe Rule outbuildings in the country (See Figure 2.2.15, Table of Scribe Rule Barns). Sixteen outbuildings are barns, one is a smokehouse, and one is a small building described as a farm shop. Most of those barns are considerably larger than the 1830s section of the Carson-Steel Barn. (See photos in Figure 2.2.16). Seven, including the Carson-Steel Barn, are in Ohio, and all are in the eastern United States. The Ohio barns are the farthest west with a single exception—the Pelster House- Barn in Missouri, which was built by German immigrants in the early 1860s.[169]

Although National Register records include at least 575 nominations that include barns, and HABS records include another 346, only 12 of those records specifically identify Scribe Rule barns or outbuildings.[170] It is likely that others in the group include Scribe Rule framing that was not mentioned or recognized by the nomination authors. Construction dates of the identified barns range from the late 1700s into the 1860s—all but four of those were built before 1832.

Another 7 barns were identified through state and local sources, which include the Ohio State Historic Preservation Office, Ross County Historical Society, Tour notes from Friends of Ohio Barns events, and conversations with historic barn experts and local historians. Historians Rudy Christian and Tom O'Grady have seen Ohio barns with Scribe Rule construction, but neither was aware of any surviving examples except the Carson-Steel Barn. The "Ohio Barn Project," a website authored by Dr. Robert Kroeger, was also helpful. Author of *Historic Barns of Ohio*, Kroeger has visited and painted at least one historic barn in each of Ohio's 88 counties, including the Carson-Steel Barn.[171] He recognizes Scribe Rule construction and occasionally mentions it in essays that accompany published images of his paintings.

Although the twenty buildings listed below are surely not the only surviving examples of Scribe Rule construction, the relative scarcity of references shows that they are an increasingly rare resource. Three of the Register-listed buildings identified here appear to have been demolished in recent years, and it is not known how many of the barns found through local sources are still in place.

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[169] Claire Blackwell, “Pelster House Barn: National Register of Historic Places Inventory Form,” US Department of the Interior, National Park Service, 1978. National Archives Catalog. Record Group 79. Accessed 2024. https://catalog.archives.gov/search?page=1&q=%22national%20register%20of%20historic%20places%22%20.

[170] Database searches used “Roman numeral” as well as “Scribe Rule” to identify descriptions that did not use the more specific terminology.

[171] Robert Kroeger, DDS, *Historic Barns of Ohio*, (Charleston, SC: History Press, 2021), and “Ohio Barn Project.” (Online collection of essays and images.) https://barnart.weebly.com/.

Figure 2.2.15. Table: Known Scribe Rule Barns, in Date Order.

Name	State	County	Scribe Rule?	ca.	Barn Age	Barn Type	Source
Briggs, Richard, Farm	Rhode Island	Kent	yes	late	1700s	Bank Barn	NR
Rolfe Barn	New Hampshire	Merrimack	yes	ca.	1790	Double-English Barn	NR
Parker Training Academy Dutch Barn	New York	Dutchess	yes	ca.	1790-1810	Dutch Barn	NR
Henry Farm (Boundary Increase)	Tennessee	Blount	yes	ca.	1792	Multipurpose	NR
Sherman Farm Hay Barn	New York	Rensselaer	yes	ca.	1800	English	NR
Sherman Farm Shop	New York	Rensselaer	yes	ca.	1800	Shop	NR
Tower-Flagg Barn Complex	Rhode Island	Providence	yes	early	1800s	English Barn	NR
Oyster Family Barn	Ohio	Stark	yes	ca.	1800s	Double Forebay Bank Barn	Ohio SHPO + Farm Progress
Morris, John Barn ("Glenallan")	Ohio	Ross	Yes, in rafters	ca	1810	English Barn	Ohio Barn Project
Beede Farm	New Hampshire	Carroll	yes	ca.	1810-20	Gable-Front Bank Barn	NR
Poorman Barn	Ohio	Perry	yes	ca.	1819	Sweitzer Barn	Farm Progress
Lainhart Dutch Barn	New York	Albany	yes	ca.	1819-1859	Dutch Barn	NR
Druhot, Scott and Debbie, Barn	Ohio	Carroll	yes	ca.	1820	Sweitzer Barn	Farm Progress
Ault-Weygandt Barn	Ohio	Wayne	yes	ca.	1827	Sweitzer Barn	Ohio History
Carson-Steel Barn	Ohio	Ross	yes	ca.	1831	Gable Front	HSR Study Property
Smith, Thomas & Esther, House	Massachusetts	Hampden	yes	pre	1850	New England and English style	NR
Loftin Smokehouse	North Carolina	Dulin	yes	ca.	1852	Smokehouse	NR
Pelster House Barn	Missouri	Franklin	yes	ca.	1860s	German House Barn	NR
Guterba Barn	Ohio	Mahoning	yes	pre	1861	Sweitzer Barn	Farm Progress
McQuiston Barn	Ohio	Preble	yes		unknown	Sweitzer?	Friends of Ohio Barns

Figure 2.2.16a. Photos of Scribe Rule Barns Listed in the National Register. (All photos are from National Register Records at the Library of Congress.)

Beede Farm - New Hampshire



Briggs, Richard, Farm - Rhode Island



Figure 2.2.16b. Photos of Scribe Rule Barns Listed in the National Register.

Henry Farm - Tennessee



Lainhart Dutch Barn - New York



Figure 2.2.16c. Photos of Scribe Rule Barns Listed in the National Register.

Loftin Smokehouse - North Carolina



Parker Training Academy - New York



Figure 2.2.16d. Photos of Scribe Rule Barns Listed in the National Register.

Pelster House Barn - Missouri



Rolfe Barn - New Hampshire



Figure 2.2.16e. Photos of Scribe Rule Barns Listed in the National Register.

Sherman Hay Barn - New York



Sherman Farm Shop - New York



Figure 2.2.16f. Photos of Scribe Rule Barns Listed in the National Register.

Smith, Thomas and Esther, Property - Massachusetts



Tower-Flagg Barn Complex - Rhode Island



Other Ohio Barns Built Before 1868

Research also identified 26 Ohio barns constructed before the end of the period of significance of the Carson-Steel Barn that have timber frames. Nine of those do not appear to have Scribe Rule framing, and framing methods for the rest are unknown.

Figure 2.2.14. Table: Ohio Barns Built before 1868.

Name	State	County	Scribe Rule?	ca.	Barn Age	Barn Type	Source
2179 Owl Creek Road	Ohio	Ross	unknown	mid	1800s	Gabled	Site Visit
3504 Owl Creek Road	Ohio	Ross	unknown	mid to late	1800s	Gabled	Site Visit
Baumgardner, William, Property	Ohio	Miami	no	ca.	1857	Seed Barn	NR
Bell, Hiram, Farmstead	Ohio	Columbiana	no	ca.	1850	English Barn	NR
Bixler, George, Farm	Ohio	Montgomery	no	ca.	1852	Sweitzer Barn	NR
Brown-Gorman Farm	Ohio	Hamilton	no	ca.	1835	Bank Barn	NR
Bull, Jonah, House	Ohio	Montgomery	no	ca.	1805-1850	English Barn	NR
Carrol's Mill	Ohio	Hocking	unknown	early	1800s	Unknown	Ohio Barn Conference
Cochran Farm	Ohio	Butler	no	mid	1800s	Bank Barn	NR
Cook, John, Farm	Ohio	Delaware	no	pre	1863	Gabled (3 barns)	NR
Deardoff, Daniel L., Property	Ohio	Warren	unknown	ca.	1800s	Gabled	NR
Drake, Elam, Property	Ohio	Franklin	no	ca.	1867	Brick Multipurpose Barn	NR
Emmit Distillery Stables	Ohio	Ross	unknown	ca.	1860s	Gambrel Roof added later	Ohio SHPO Survey
Gifford, John Barn	Ohio	Pickaway(?)	unknown	early	1800s	Double-Crib Barn	Ohio Barn Project
Goll Homestead	Ohio	Fulton	probably not	ca.	1865	Multipurpose, with early alterations	NR
Hunt-Forman Farm	Ohio	Warren	no	ca.	1840-50	Large Side Gabled Barn	NR
Kahn, Billy and Nancy, Property	Ohio	Clermont	unknown	ca.	1820s	Three-Portal	Ohio Barn Project
Limestone Vale	Ohio	Delaware	unknown	mid	1800s	Stone End Bank Barn	NR
Marquart-Mercer Farm	Ohio	Clark	unknown	early	1800s	English Barn, log	NR
McCoy, James, Log Barn	Ohio	Ross	unknown	ca.	1796-1810	Double-Pen Barn	Ohio SHPO Survey
McDonald Farm	Ohio	Greene	unknown	ca.	1829	Sweitzer Barn	NR
Old Butterworth Barn	Ohio	Warren	unknown	ca.	1810s-20s	Bank Barn	Ohio Barn Project
Platter, Peter, Barn	Ohio	Ross	unknown	ca.	1800-1840	English Barn	Ohio SHPO Survey
Salt Property	Ohio	Clermont	unknown	ca.	1814-1826	Frame barns w/ gable - roof	NR
Sprague, Jonathan, Property	Ohio	Washington	unknown	ca.	1803	English Barn	NR
Teeters, Nevada and Andy, Barn	Ohio	Highland	unknown	early	1800s	English Barn, 1.5 stories	Ohio Barn Project

Conclusion

The building erected by William Carson ca. 1831 had an extremely unusual form and a now-scarce type of heavy timber construction. It cannot be neatly categorized according to recognized typologies for vernacular barns or other agricultural buildings. The lack of room between framing members for wagon doors is particularly noteworthy and a puzzle that may never be solved. The framing system used for the building is much easier to categorize; the frame was clearly constructed with the help of a master craftsman familiar with Scribe Rule principles. It is equally clear that, notably, few US examples of Scribe Rule framing are still extant.

Significance

The Carson-Steel Barn offers a notable physical snapshot of early American timber framing practices transitioning from Old World craftmanship to modern light-frame construction. Most of the connections in the original part of the barn, constructed ca. 1831, utilize Scribe Rule joinery, identified by distinctive marriage marks and tight-fitting joints. When the barn was expanded to its current form ca. 1868, the builders used the Square Rule method. The combination of those distinctive construction techniques in the Carson-Steel Barn reflects the evolution of timber framing practices that were common in the first half of the 19th century, before the development of dimensional lumber. The barn provides a late example of Scribe Rule framing in Ohio. As barn expert Rudy Christian noted in a recent interview, it was very unusual to see Scribe Rule framing used in states immediately west of Ohio because those states were settled later, after Square Rule and other methods had become the norm. As a result, he felt the Carson-Steel Barn could be one of the latest examples of Scribe Rule in the region.

The barn is also notable for its long connection to farming in Union Township and for its association with Joanna Steel, one of very few female professional farmers in her time. It served as an agricultural outbuilding for almost two centuries, and it still looks much as it did when Joanna Steel was alive.

Timeline of Important Events

Preconstruction

1 CE to 400 CE. Hopewell Culture was active in the area. [2016 CLR, 2-9.]

400 CE to 1450 CE. Indigenous cultures, including Jack's Reef Horizon people and the Fort Ancient culture, occupied the area until it was depopulated for unknown reasons around 1450. [2016 CLR, 2-19.]

1650 Shawnee, Delaware, Miami, and Wyandotte tribes were in the area when the first white settler arrived. [2016 CLR, 2-21.]

1788 Nathaniel Massie began surveying land in the Virginia Military District, which was established in 1784. [1880 History of Ross and Highland Counties, 219.]

1795 Nathaniel Massie registered a survey of Virginia Military District tract 2531, which includes the Carson Steel barn lot. ["Survey Book Virgina Military District," Ross County Ohio Recorder's Office, Chillicothe, OH.]

1796 Nathaniel Massie laid out the town of Chillicothe. [1880 History of Ross and Highland Counties 47.]

1798 August 20. Ross County formed in the Northwest Territory. (Ohio was not yet a state.) [http://www.co.ross.oh.us]

1798 10/03/1798, Joseph and Sarah Darlington buy a 400-acre parcel from Massie. Most of that land was in VMD 2531; an area close to the creek (south of the barn) was in VMD 8717. [Ross County map of VMD parcels, and deed cited in Deed Book 13, p. 477, an 1814 deed from Darlington to Ashbee, Ross County Recorder; see below.]

1798 Joseph Darlington was appointed Adams County Clerk, which makes it unlikely that he was living in Ross County. [History of Adams County, p. 252.]

1803 March 1, Ohio became a state.

1803 White Brown built a log barn near Chillicothe. In 1902, it was believed to have been the oldest barn in Ross County. [The County of Ross: A History of Ross County Ohio, 1902. 272-73.]

ca. 1808 John Stretch of Liberty Township (East of Scioto) was a teacher and carpenter who designed and built many local residences and barns. [1902 Ross County History, p. 364. History of Ross and Highland Counties, p. 277.]

1807 "First hewed log barn…perhaps in the county" was erected on farm of Jacob Heistand. It took about 50 people to raise it, they came from 30 miles around, "on

horseback, bringing their axes with them." Heistand was living in Highland County in 1810, so this barn was likely in that county as well. [History of Ross and Highland Counties, 506; About Ohio, U.S., Compiled Census and Census Substitutes Index, 1790-1890.]

1809 Union Township was organized. [History of Ross and Highland Counties, 497.]

1814 May 20. Jeremiah Ashby (sometimes spelled Ashbee) purchased the 400-acre parcel from the Darlingtons for $4,000. ($10 an acre.) [Ross County Recorder, Deed Book 13, p. 477.] Darlington financed the sale to Ashby. [Ross County Recorder Deed Book 13, p. 350.]

1816 Ashby sells 55-1/2 acres of the 400-acre tract to Edward Fitzgerald for $555. ($10/acre). It is the first of several sales of land in that tract. [Ross County Recorder Deed Book 13, p. 435.]

1818 April. "Record of Jeremiah Ashby's Survey." Survey Maps on file with Ross County Engineers show all of HMG and 253-1/4 acres of Jeremiah Ashby's Land in VMD 2531, plus several parcels Ashby sold off that same year. The survey appears to cover the full 400-acre tract Ashby bought from Darlington.

1820 First available Ross County real estate tax records show Jeremiah Ashby with 250 acres (200 in 2531, 50 in 8717) and Daniel Ashby with 55-1/2. Neither was assessed for a house.

1820 Antiquarian Caleb Atwater writes "The land on which these works are situated belongs to Mr. Ashley (probably Ashby) and Col. Evans, of Ross County." [Atwater 1820, 183.] Evans owned land just west of the Ashby property, per the 1818 Ashby survey.

1820 1880 County History notes that after the War of 1812, "frame houses began to appear" and "log and frame barns were built for the protection of the stock and the housing of the crops." [1880 History of Ross and Highland Counties, 60.]

1825 Ohio tax law changes to an ad valorem system, which evaluated buildings as well as land. Previously, real estate was taxed based only on the quality of the land. [tax.ohio.gov/taxeducation]

1828 Jeremiah Ashby sells Daniel Ashby 50 acres of the 400-acre Darlington Tract ($6/acre). This tract is along the east edge of the 256-acre parcel shown in the 1818 map. There was a house on that parcel, per a note in the 1828 taxes: "same value including the house." [1828 Tax Book and Ross County Recorder, Deed Book 24, p. 94.]

Episode 1. William Carson, Construction of the Original Barn: ca. 1829-1860

1829 Sept. 7. Daniel and Elizabeth Ashby to Wm. Carson: the same 51 acres Daniel bought from Jeremiah Ashby. Carson paid $500. [Ross County Recorder, Deed Book 24, p. 93.]

1829 Nov. 4. Jeremiah Ashby to Wm. Carson: 200 acres for $1800 ($9 an acre.) [Ross County Recorder Deed Book 24, p. 141.] That transaction included the barn property.

1829 Real estate tax records still show Jeremiah and Daniel Ashby as owners of land in 2531. Jeremiah Ashby also owned two other small parcels in VMD 8717 that totaled 50 acres; he was not assessed for a dwelling. Daniel Ashby had two different parcels in 2531, one was 53 acres, and one was 57 acres with a frame house valued at $200.

1830 Census. William Carson was living in Chillicothe, apparently with his family. 10 people in his household: 7 white and 3 free blacks.

1830 Census. William Clark was living in Ross County.

1830 Census. (Mahlon or Mahlow) Anderson living in Union Township.

1831, ca. First section of the barn was constructed by or for William Carson. [Trees cut 1830, per dendrochronology.]

1833 Wm. Carson sold Wm. Clark 250 acres for $3200. This included Daniel Ashby's 50 acre parcel too. (This is the blue lot in 1818 map.) Increased value likely reflects the construction of the Carson-Steel Barn and other improvements made by Carson. [Ross County Recorder Deed Book 27, p 309.]

1838 April 9, Chillicothe incorporated as a city. [1871 Pioneer Record of Ross County, 129.]

1840 Willam Carson died after a buggy accident that occurred while he was driving between Chillicothe and Frankfort. [History of Franklin Co. PA. p. 847.]; "A Painful Death" [Public Ledger, Penn, 1840; Baltimore Sun 1840.]

1840 Personal property records in Wm. Carson's probate file show he owned large stocks of cloth, clothing, and household goods, but nothing related to agriculture. [Ross County Probate File, Case #1388.]

1841 William C. Clark adds a brick house to his 250-acre farm. [County Real Estate Tax Records—Appendix C.]

1845-46 Dr. Edwin Hamilton Davis and Ephraim Squier survey what is now the Hopewell Mound Group. The 250-acre farm and barn site were described as the "estate of W. C. Clark, esq.," and the farmstead was labeled "Clark's" or Clark's Gateway." The earthworks were labeled, "North Fork, Works," another early name for the

site. [Squier, E. G, and E. H. Davis, "Ancient Monuments of Mississippi Valley." Washington D. C.: Smithsonian Institution, 1848: 26-26, Plate X.]

1848 Squier and Davis include the map of the site in "Ancient Monuments of the Mississippi Valley." [Squier and Davis, 26.]

1848 William C. Clark dies, and his land passes to his wife Sarah and two daughters, Caroline and Joanna. (Joanna is also occasionally spelled Johanna.) No land or buildings were mentioned in probate files. [Ross County Probate Record #1438 for William Clark.]

1859 June 20. Joanna Clark age 20, married George W. Steel, age 23. [Ross County Marriage Records, Ancestry.com.]

1860 Census. George W. Steel living in the 4th Ward in Chillicothe, was employed as a merchant. Joanna and Sara Clark (her mother) are living with him along with her 1-month son William C. and servant Elizabeth Richards, who was also living with Joanna and her mother in 1850. [1860 Census.]

1867 Joanna C. Steel's husband, George W. Steel, dies. [Ross County Probate Records, Find a Grave.] Note: another George Steel from Ross County was killed in 1864, per the History of Ross and Highland Counties, p. 133; probate records show that there were two George Steels in the area at the time.

Episode 2. Joanna C. Steel: 1868-1889

1868, ca. The addition to the barn was built by or for Joanna Steel. (Dendrochronology shows trees were cut in 1867.)

1870 Census: Joanna Steel is apparently head of her household, which includes two children and her mother, but she is listed as "Keeping House." She also had two domestic servants and two farm laborers living with her. [1870 Union Township Population Census.]

1875 Union Township Atlas labels the farm as belonging to Mrs. Joanna Steele [sic]." She is one of just two women included in the business listings of that atlas—both women were farmers. [1875 Gould's Atlas, 73.]

1880 Census: Joanna Steel, 44 living in Union Township with her son Willam 20, daughter Corry (Carrie) 16, and one servant, Lizza Richards, 65.

1888 ca. Oct. 17. Joanna Steel dies. Son William C. and daughter Carrie Cox. [Ross County Probate File $10519, Joanna Steel, 1888.]

1889 Nov. 15. Joanna Steel's heirs sold land totaling 261 acres (256.89 in 2513) to Mordecai Cloud Hopewell for $16,000. [Ross County Deed Records, Vol 107,

page 41; M. C. Hopewell will in probate file.] The farm was known as the Joanna C. Steel Farm at the time of the sale. [Ross County Deed Book 107, p 41, Steel to Hopewell Nov. 1889.]

Episode 3: M. C. Hopewell, Archeological Investigations and Continued Agricultural Use: 1890-1973

1891-92 Warren K. Moorehead led excavations at Hopewell Mound Group. He changed the earthwork complex's name to reflect the current landowner, Mordecai Cloud Hopewell. [2016 CLR 2-25.]

1894 Ross County reported 27,000 pounds of tobacco grown but the industry was abandoned by 1902. [Ross County History, 136.]

1900 Greatest crop of Ross County was corn. 61,241 acres were devoted to corn in the spring of 1900. Wheat is second, with 50,000 acres of wheat fields in 1900. [Ross County History, 135.]

1900 Census: M. C. Hopewell, Ella R. M. Hopewell, Willie Moore, (Brother-in-law) living on East 4th Street in Chillicothe's Ward 5. [1900 Census] A later newspaper article noted that the Hopewells never lived on the farm. [Chillicothe Gazette, 1993]

1900 David Pettiford was living on the "Hopewell farm, near Sulphur Lick Springs…." Probate records show that Hopewell had two Ross County farms when he died; that article probably refers to the barn site. [*Chillicothe Gazette* June 21, 1900.]

1900 John Corcoran and George Steel may have been tenant farmers on Hopewell's land. "Corcoran will operate the Hopewell farm when vacated by Mr. Steel." George Steel's relationship to Joanna Steel is unknown; he may have been a cousin of her husband. [*Chillicothe Gazette*, Nov. 27, 1900.]

1903 M. C. Hopewell dies. [Obituary June 8, 1903, *Chillicothe Gazette*.]

1903 Hopewell's will left most of his estate to his wife Ella, including their house in Chillicothe and "...two farms situate [sic] in Union and Twin Townships…one of which contains 261 acres known as the Johanna [sic] Steel farm and being the same farm purchased by me from the heirs"…of Steel. Deed Book 104, p 41. [Ross County Probate file for M. C. Hopewell.]

1910 Article about a fire at a "four-room tenant house on Hopewell the farm near Anderson Station," noted that the tenant farmer was named Sam Long. [Chillicothe Gazette April 8, 1910] That house may have been Daniel Ashby's 1830s frame house.

1924 Plowing at Hopewell farm uncovered human burials. [*Chillicothe Gazette*, Mar. 20, 1924.]

1922-25 Henry C. Shetrone conducted excavations at the Hopewell Mound Group. The 2016 CLR observed that his "excavations and mapped earthwork locations remain as the authority on the Hopewell Mound Group." [2016 CLR 2-45.] That project also produced photos of the Hopewell farm, including a rare photo of the Carson-Steel barn and the overall farmstead. [Figures 2.1.23 and 2.1.24.]

1938 Ella R. Hopewell died. [Obit, *Chillicothe Gazette,* Oct. 28, 1938, 1.] She had no children, and her will directed that the Union Township property be sold, and the proceeds were to go to relatives of her husband and various charities. [*Chillicothe Gazette*, Nov. 18, 1938, 1.]

1939 Deed: James and Rose Acord to Clyde and James Clarence Acord. [Ross County Recorder b 256 p 369; Ross County Probate file for Ella Hopewell.]

1944 Topo map shows three buildings at the barn site, laid out like the farmstead shown in the 1984 photo. [USGS Topographic Map, Roxabell Quad, 1944.]

1961 Topo map shows house, outbuilding, and a driveway or lane at the barn site. [USGS Topographic Map, Roxabell Quad, 1961.]

1967-69 Deed from Acord to Johnson. [Ross County Recorder, Deed Book 346, p. 621, and Deed Book 357, p. 95.]

Episode 4. National Park: 1974-Present

1974 Hopewell Mound Group listed in the National Register of Historic Places for archeological significance. (#74001616 Restricted) [2016 CLR 2-61.]

1980 Part of the Hopewell Mound Group was purchased by the non-profit The Archaeological Conservancy from private landowners. That did not include the barn parcel. [Ross County Recorder, Deed Book 444, p. 43, Deed Book 444, p. 45, and 2016 CLR 2-61.]

1980-81 Dr. Mark Seeman of Kent State University conducted a site survey of the Hopewell Mound Group accurately locating most of the mounds through aerial photography and surface survey. [2016 CLR 2-61.]

1984 Vintage Aerials photo shows the barn, with a west addition, along with the rest of the farmstead. A small saltbox house shown on the east end of the farmstead may be the house Clark added in 1841. [Vintage Aerials, 1984 Film Roll 27 Photo 27-YRO-16]

1992 May 27. Hopewell Culture National Historical Park was established. Hopewell Mound Group is part of that park. [2016 CLR 2-61.]

1994-95 Willam S. Dancey of Ohio State University directed the "Hopewell Earthwork Catchment Survey." [HOCU]

1995-96 Site survey conducted of Hopewell Mound Group for boundary adjustments. [2016 CLR 2-61.]

1995 Another Vintage Aerials photo shows the barn, now with a west addition, along with the rest of the farmstead. The saltbox house has been replaced with the house now on the property. [1995 Film Roll 45 Photo 46-OXRO-32.]

1997 Archaeological Conservancy sells its part of the Hopewell Mound Group to the National Park Service. [Ross County Recorder, Deed Book 88, p. 405.] A plat book made that same year shows that the conservancy land was north of the railroad.

1997 Plat Book shows the barn parcel south of the railroad was owned by Earl and Genva Ray, who also owned the house lot east of the barn. The Ray family still owns the parcel to the east, per 2024 Assessor records.

1999 A recreation trail was extended through Hopewell Mound Group, along the right of way of a former railroad. [2016 CLR 2-63.]

2001 Archeologists from NPS and Ohio State University used magnetometry to investigate the Hopewell Mound Group. That study identified a previously unknown circular enclosure within the main enclosure, and archaeological features that demonstrate long-term term use of the landform. The study did not find evidence of Hopewell habitation within the main enclosure. [CLR 2-65.]

2003 US acquired 25.29 acres of land known as NPS parcel 102-5 from Earl and Genva Ray through condemnation. That property includes the Carson-Steel barn. [Deed Book 250, p. 826.]

2003 US acquired land from Richard and Linda Johnson through condemnation. [Deed Book 250, P 837.] That purchase did not include the barn; the Johnson land is in the north part of the Hopewell Mound Group. [1997 Atlas Map.]

2000s Storm damages the roof of Carson-Steel Barn. [NPS files.]

2008 CLI noted the Carson-Steel barn was scheduled for demolition in 2009. [CLI, no author or date listed; notes in text indicate ca. 2008.]

2010 Modern implement shed next to the Carson-Steel Barn was removed. [NPS Files.]

2013 Topo map shows boundaries of HMG. (It was not labeled on the 2010 topo map.) The National Park Service NPS contracted Ohio Valley Archaeology, Inc. (OVAI) to complete a landscape-scale geomagnetic survey, and a 2015 partnership between NPS and German Archaeological Institute resulted in geomagnetic

survey of almost all NPS property at the Hopewell Mound Group Unit. [2016, CLR 2-65.]

2014 Historic barn expert Rudy Christian assessed the barn and corn crib. The barn was the only building identified as historically significant. [Christian and Son report to NPS 2014.]

2016 A Cultural Landscape Report and Environmental Assessment of the entire park described the barn Carson-Steel barn as a significant example of the "architectural and agricultural history of Ohio," which was "in need of immediate stabilization." [2016, CLR 3-109.]

2018 Corn crib was demolished. [PEPC ID#72810, HOCU files.]

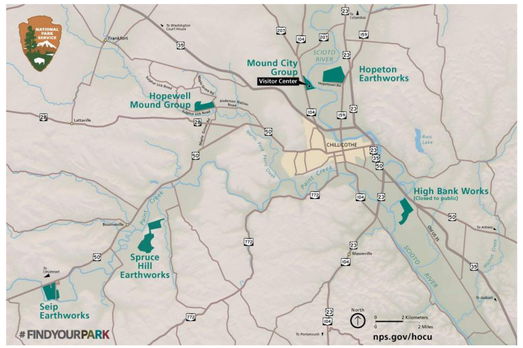
2024 Eligibility Assessment submitted to the Ohio Preservation Office yields a response that the Carson-Steel may be eligible for the National Register listing, with local significance in the area of Architecture.

2024 Structural assessment of the barn by Silman Associates and STRATA Architecture Inc. revealed significant structural deficiencies, with some areas in a state of imminent collapse.



EXISTING CONDITIONS DRAWINGS

CARSON-STEEL BARN HISTORIC STRUCTURE REPORT
HOPEWELL CULTURE NATIONAL HISTORICAL PARK
CHILLICOTHE, OH



VICINITY MAP
N.T.S.

BLDG

Sheet Index

General

G001 Cover and Index

Architectural

EX101 Existing Plans
EX201 Existing Elevations
EX202 Existing Elevations
EX301 Existing Sections

SYMBOLS LEGEND

0 — STRUCTURAL/COLUMN GRID

Name / Elevation — ELEVATION HEIGHT TAG

BLDG — TRUE NORTH; NORTH ARROW; PROJECT NORTH

Room name / 101 — ROOM TAG

101 — DOOR TAG

101 — WINDOW TAG

WB1 — POST TAG

A/E FIRMS

PRIME/ARCH:
STRATA ARCHITECTURE
1701 OAK STREET, SUITE 100
KANSAS CITY, MO
T: 816.474.0900

STRUCTURAL:
SILMAN ASSOCIATES
ANN ARBOR, MI

EXISTING CONDITIONS DRAWINGS

UNITED STATES
DEPARTMENT OF THE INTERIOR

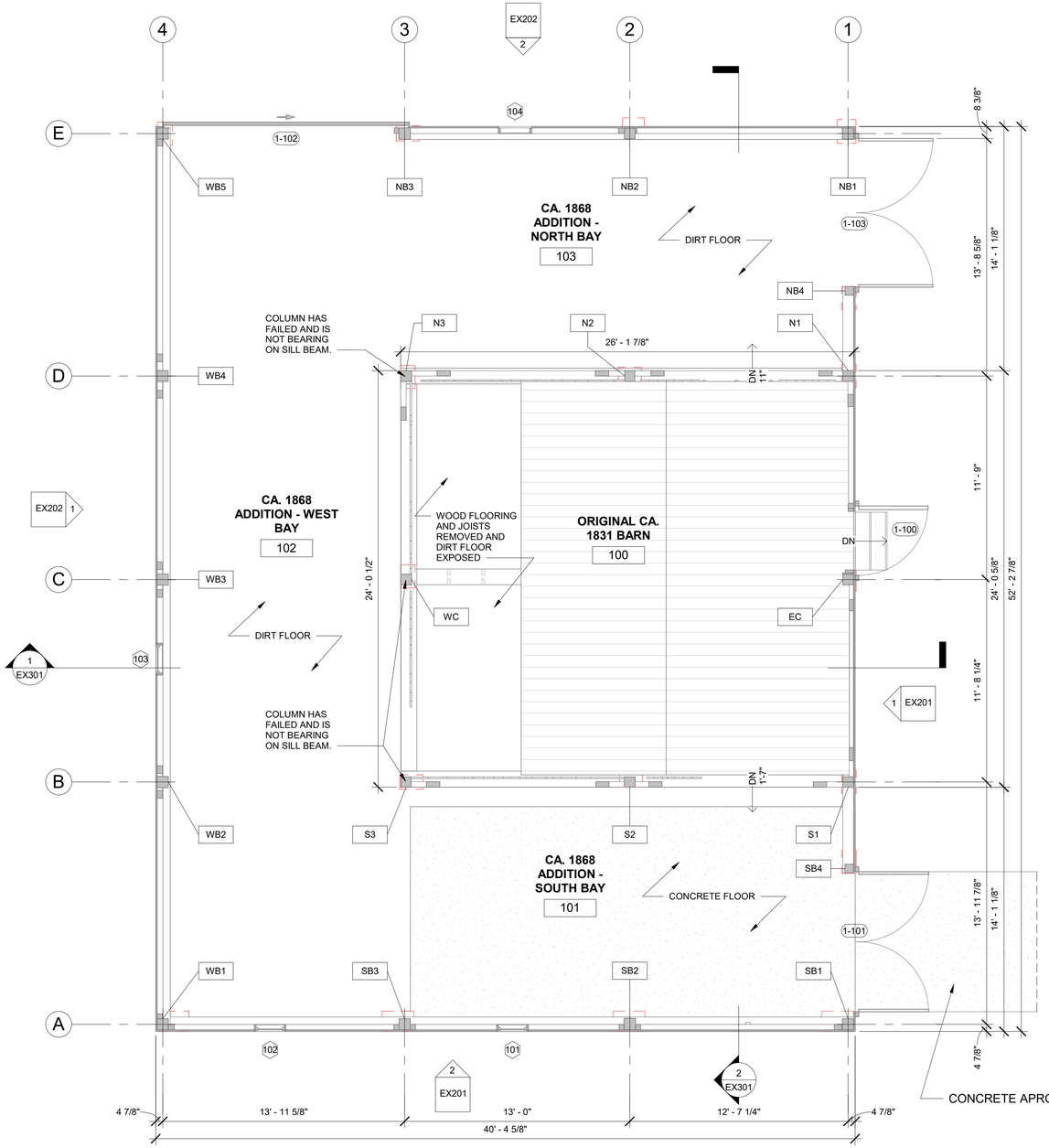
NATIONAL PARK SERVICE
DENVER SERVICE CENTER

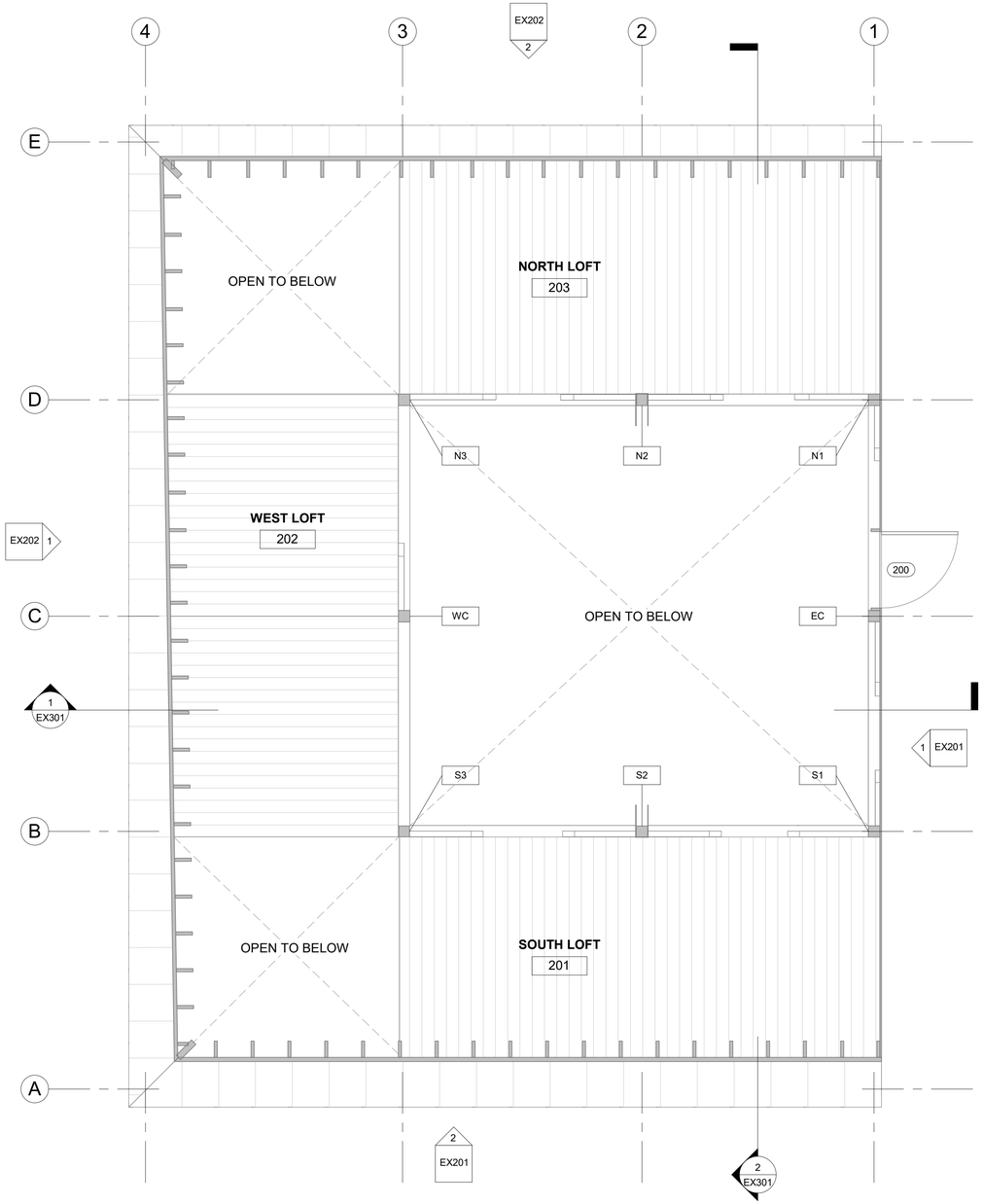
TITLE OF SHEET
Carson-Steel Barn HSR
LOCATION WITHIN PARK
Hopewell Mound Group
NAME OF PARK
Hopewell Culture National Historical Park

REGION	COUNTY	STATE
Midwest	Ross	Ohio

DRAWING NO. 353 80056
PMIS/PKG NO. 314612
SHEET 1 OF 5

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1 EX101 Level 1 Existing Floor Plan
1/4" = 1'-0"

4' 0 4' 8'
1/4"=1'-0"

BLDG

2 EX101 Level 2 Existing Floor Plan
1/4" = 1'-0"

4' 0 4' 8'
1/4"=1'-0"

BLDG

EXISTING CONDITIONS PLAN LEGEND

STONE / CONCRETE PIER BELOW

GENERAL NOTES

A. FOR CLARITY, ELEMENTS ARE DRAWN WITHOUT STRUCTURAL FAILURES SHOWN. RE: REPORT FOR DETAILED IMAGES OF STRUCTURAL FAILURES.

B. CONTEMPORARY WOODEN ELEMENTS NOT SHOWN.

A/E FIRMS

PRIME/ARCHITECT:
STRATA ARCHITECTURE
1701 OAK STREET,
SUITE 100
KANSAS CITY, MO
T: 816.474.0900

STRUCTURAL:
SIMAN ASSOCIATES
ANN ARBOR, MI

DESIGNED: AG
CADD: ZA
TECH. REVIEW: AG
DATE: 12.12.2024

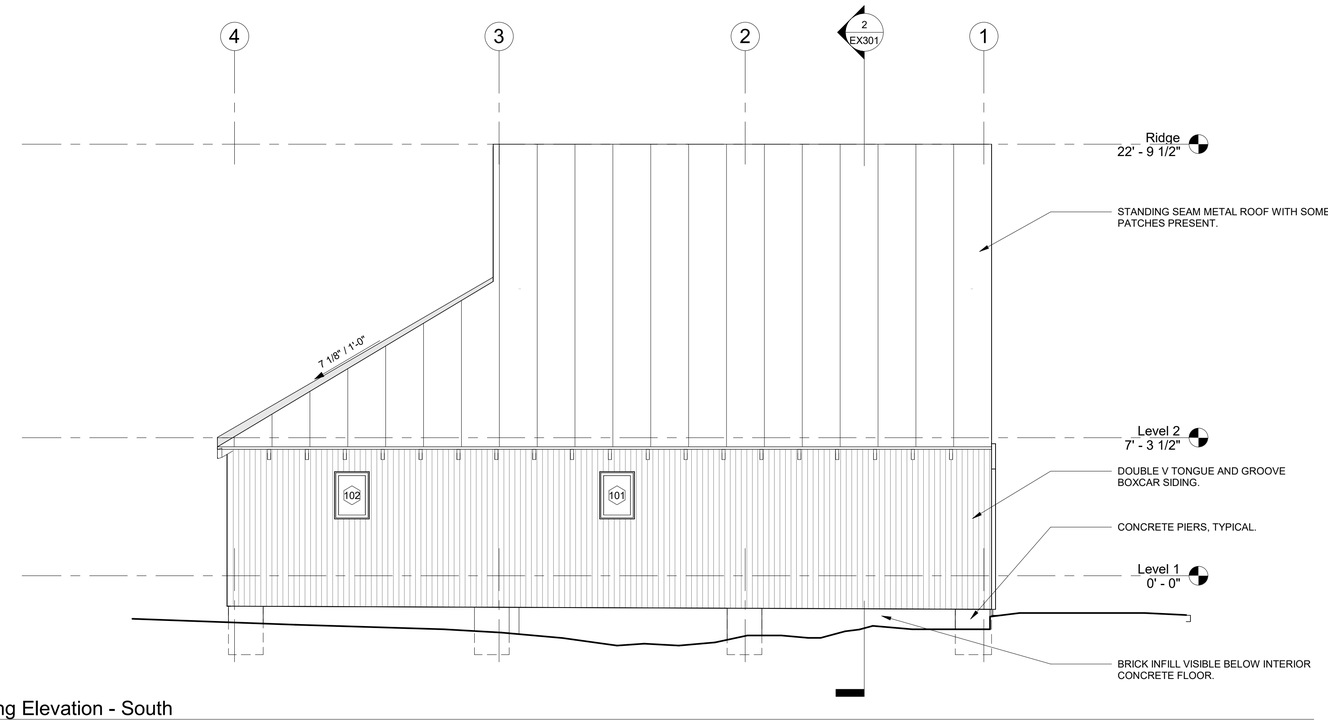
SUB SHEET NO. 00 EX101

TITLE OF SHEET
HOCU - Carson-Steel Barn
Existing Plans

CARSON-STEEL BARN HISTORIC STRUCTURE REPORT
HOPEWELL CULTURE NATIONAL HISTORICAL PARK

DRAWING NO. 353 80056
PMIS/PKG NO. 314612
SHEET 2 OF 5

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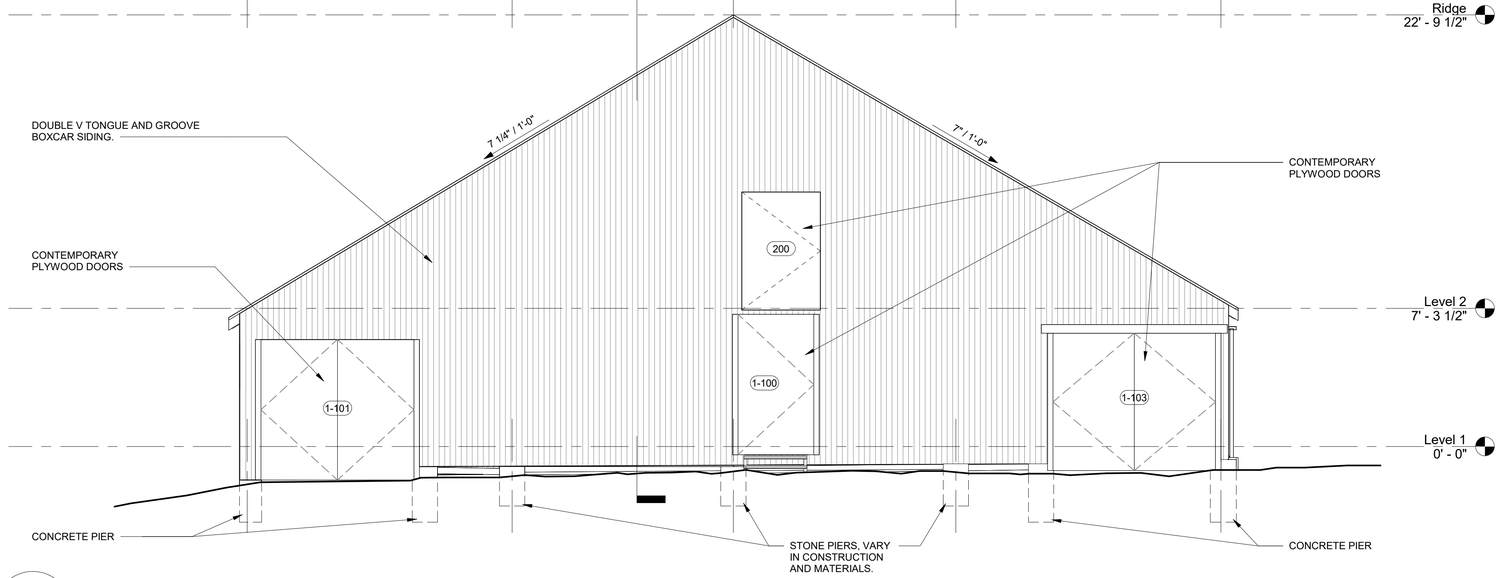


2 EX201 Existing Elevation - South

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4' 0 4' 8'

1/4"=1'-0"



1 EX201 Existing Elevation - East

1/4" = 1'-0"

4' 0 4' 8'

1/4"=1'-0"

GENERAL NOTES

A. FOR CLARITY, ELEMENTS ARE DRAWN WITHOUT STRUCTURAL FAILURES SHOWN. RE: REPORT FOR DETAILED IMAGES OF STRUCTURAL FAILURES.

B. CONTEMPORARY WOODEN ELEMENTS NOT SHOWN.

A/E FIRMS

PRIME/ARCHITECT:
STRATA ARCHITECTURE
1701 OAK STREET,
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KANSAS CITY, MO
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STRUCTURAL:
SILMAN ASSOCIATES
ANN ARBOR, MI

DESIGNED: AG

CADD: ZA

TECH. REVIEW: AG

DATE: 12.12.2024

SUB SHEET NO. 00 EX201

TITLE OF SHEET
HOCU - Carson-Steel Barn
Existing Elevations

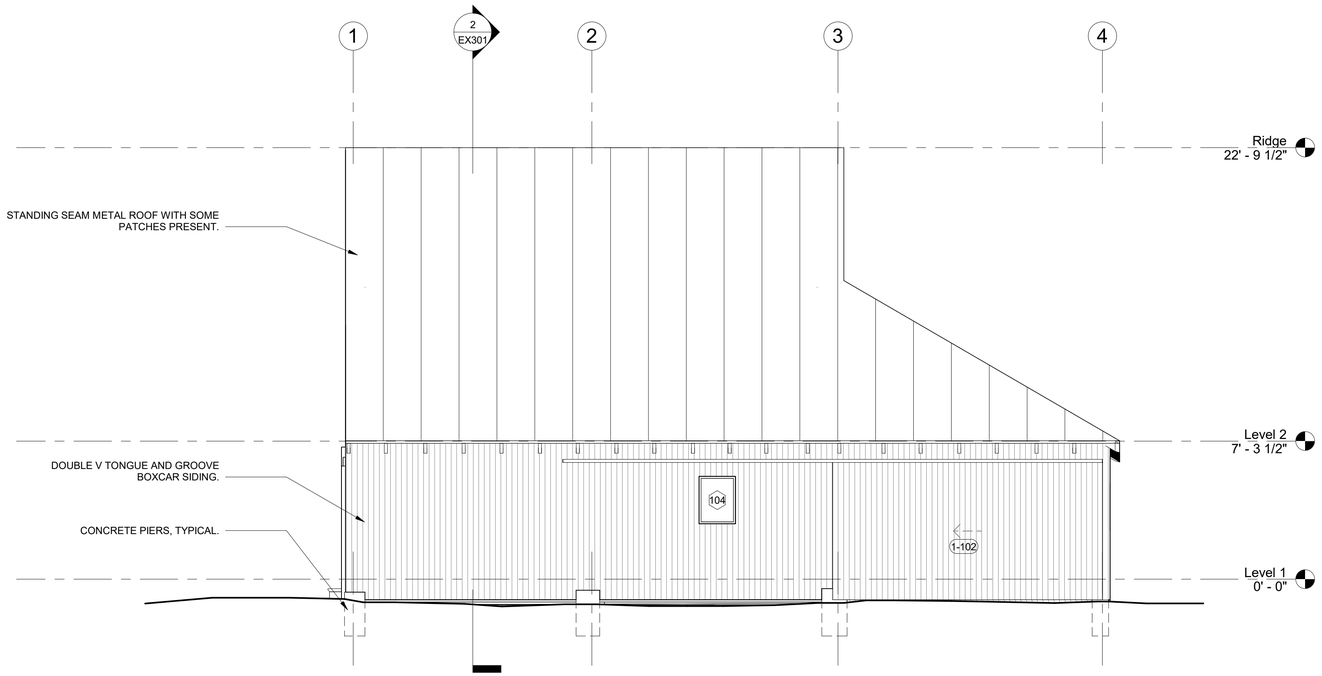
CARSON-STEEL BARN HISTORIC STRUCTURE REPORT
HOPEWELL CULTURE NATIONAL HISTORICAL PARK

DRAWING NO. 353 80056

PMIS/PKG NO. 314612

SHEET 3 OF 5

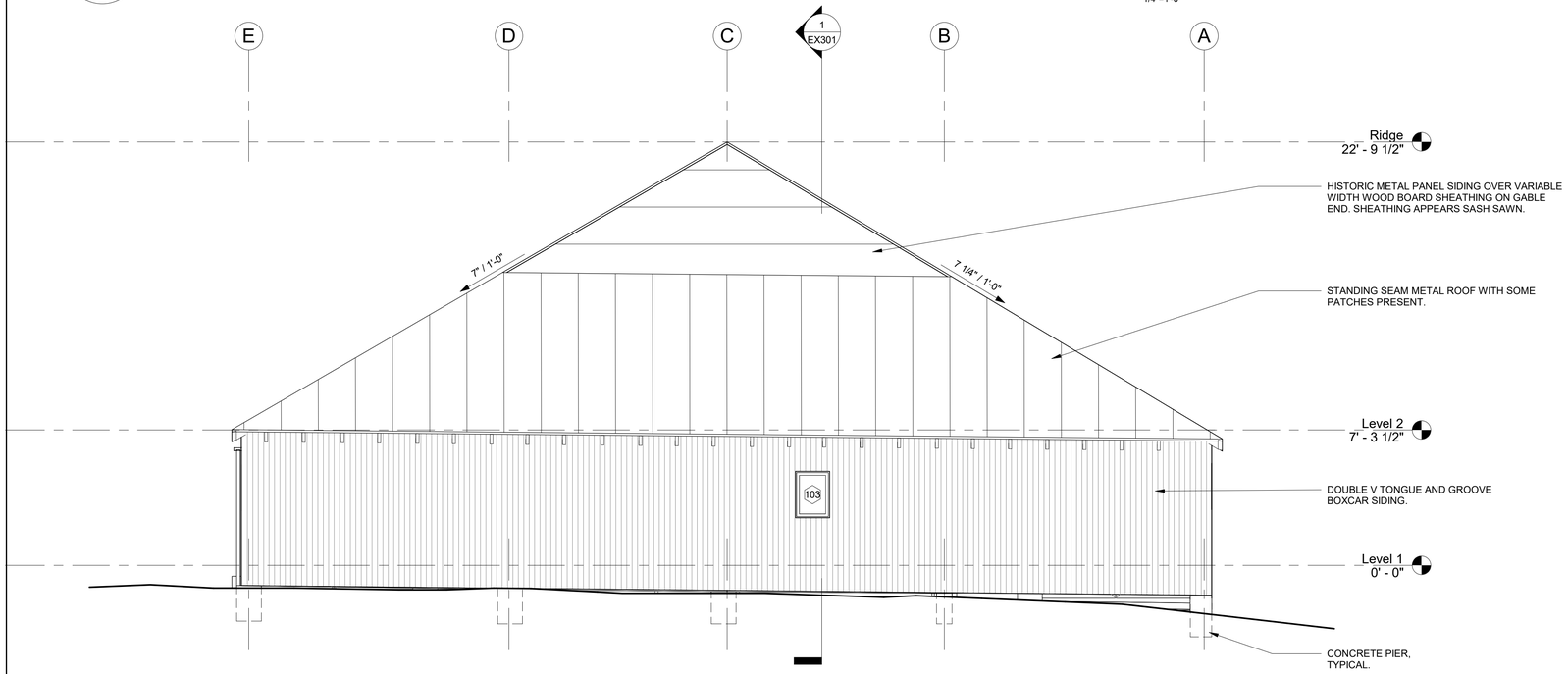
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1/4"=1'-0"



1 EX202 Existing Elevation - West

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1/4"=1'-0"

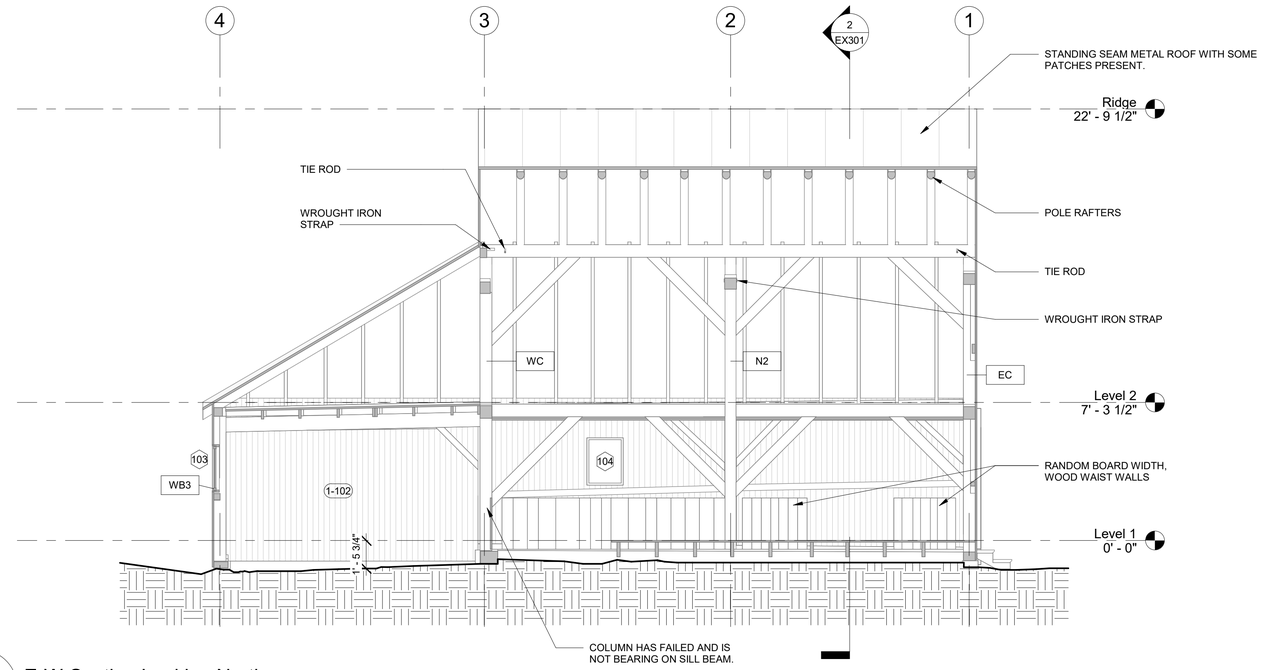
GENERAL NOTES

A. FOR CLARITY, ELEMENTS ARE DRAWN WITHOUT STRUCTURAL FAILURES SHOWN. RE: REPORT FOR DETAILED IMAGES OF STRUCTURAL FAILURES.

B. CONTEMPORARY WOODEN ELEMENTS NOT SHOWN.

A/E FIRMS PRIME/ARCHITECT: **STRATA ARCHITECTURE** 1701 OAK STREET, SUITE 100 KANSAS CITY, MO T: 816.474.0900 STRUCTURAL: **SILMAN ASSOCIATES** ANN ARBOR, MI	DESIGNED: AG CADD: ZA TECH. REVIEW: AG DATE: 12.12.2024	SUB SHEET NO. 00 EX202	TITLE OF SHEET HOCU - Carson-Steel Barn Existing Elevations CARSON-STEEL BARN HISTORIC STRUCTURE REPORT HOPEWELL CULTURE NATIONAL HISTORICAL PARK	DRAWING NO. 353 80056 PMIS/PKG NO. 314612 SHEET 4 OF 5

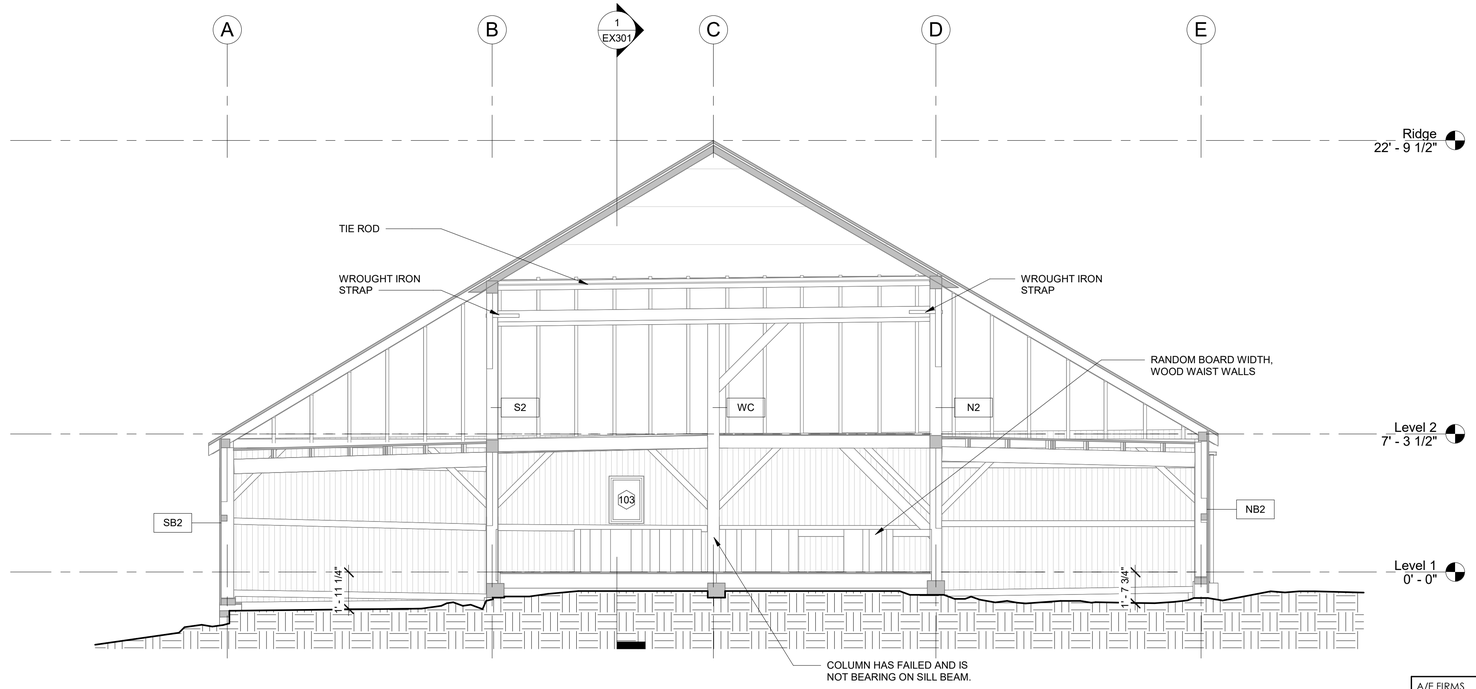
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1 EX301 E-W Section Looking North

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4' 0 4' 8'
1/4"=1'-0"



2 EX301 N-S Section Looking West

1/4" = 1'-0"

4' 0 4' 8'
1/4"=1'-0"

GENERAL NOTES

A. FOR CLARITY, ELEMENTS ARE DRAWN WITHOUT STRUCTURAL FAILURES SHOWN. RE: REPORT FOR DETAILED IMAGES OF STRUCTURAL FAILURES.

B. CONTEMPORARY WOODEN ELEMENTS NOT SHOWN.

A/E FIRMS PRIME/ARCHITECT: **STRATA ARCHITECTURE** 1701 OAK STREET, SUITE 100 KANSAS CITY, MO T: 816.474.0900 STRUCTURAL: **SILMAN ASSOCIATES** ANN ARBOR, MI	DESIGNED: AG CADD: ZA TECH. REVIEW: AG DATE: 12.12.2024	SUB SHEET NO. 00 EX301	TITLE OF SHEET HOCU - Carson-Steel Barn Existing Sections CARSON-STEEL BARN HISTORIC STRUCTURE REPORT HOPEWELL CULTURE NATIONAL HISTORICAL PARK	DRAWING NO. 353 80056 PMIS/PKG NO. 314612 SHEET 5 OF 5

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Carson-Steel Barn, looking southeast. (STRATA 2023)

3 EXISTING CONDITIONS ASSESSMENT

Chapter 3 – Existing Conditions

Introduction

This section of the Historic Structure Report records the current existing conditions of the barn structure and adjacent site. The work included investigation of the structure through 3D scanning, photography, measuring, testing, and research analysis. The assessment was informed by historical research and the dating of the timbers used in the construction.

The barn is one structure of many that once populated the historic farm complex. Historic photographs and aerials show a saltbox house and other outbuildings, including a corn crib and other barn structures on the site. The subject barn is the only historic structure remaining on the site.

The barn is currently in a state of deterioration that has made access to portions of the interior hazardous. The southwest corner and south wall were damaged from a tree falling through the roof, and roof leaks in the northwest corner and at the barn's perimeter have increased water infiltration and exposure to the weather. The west frame wall of the original ca. 1831 barn and portions of the ca. 1868 south bay have collapsed or are in immediate threat of collapsing. Much of the entire structure can be salvaged, disassembled, and reinstalled, but there will be areas requiring complete reconstruction, most notably the southwest corner and west interior frame. Where possible, work would include surgical repairs to preserve historic timber framing.

Due to concerns with unstable framing members, no ladders could be used within the west side of the barn to reach heights and evaluate the existing conditions of the timber framing and rafters. Signs have been posted on the exterior of the building by NPS staff to warn of dangers.

Site Existing Conditions

The Hopewell Mound Group unit of the Hopewell Culture National Historical Park and UNESCO World Heritage Site is near Chillicothe in south-central Ohio (Figure 3.1). The Scribe Rule Barn is within the Hopewell Mound Group (Figure 3.2).

The Hopewell Mound Group is about 300 acres, almost entirely within a large, flat field bordered on the north by wooded bluffs, on the east and west by hedgerows and wooded areas, and on the south by a smaller wooded slope trailing down from the mound group. Sulphur Lick Road and the Paint Creek Recreational Trail run through the Hopewell Mound Group, parallel to and near the south edge. The barn is south of Sulphur Lick Road, on the south edge of the level field. Directly east of the barn is private property containing a contemporary house and several outbuildings. The immediate site to the east, north, and west of the barn is flat, with grass and knee-high vegetation. There are two +/- 40' trees to the west of the barn. Grade slopes away from the barn on the south, gently for the first 5- to 10-feet, and increasing thereafter. The slope is covered by volunteer vegetation consisting of 25- to 40-foot-high trees with undergrowth, which comes to within about ten feet of the barn. At the bottom of the slope is a narrow field,

across which is the North Fork Paint Creek. The field and creek are not visible through the vegetation.

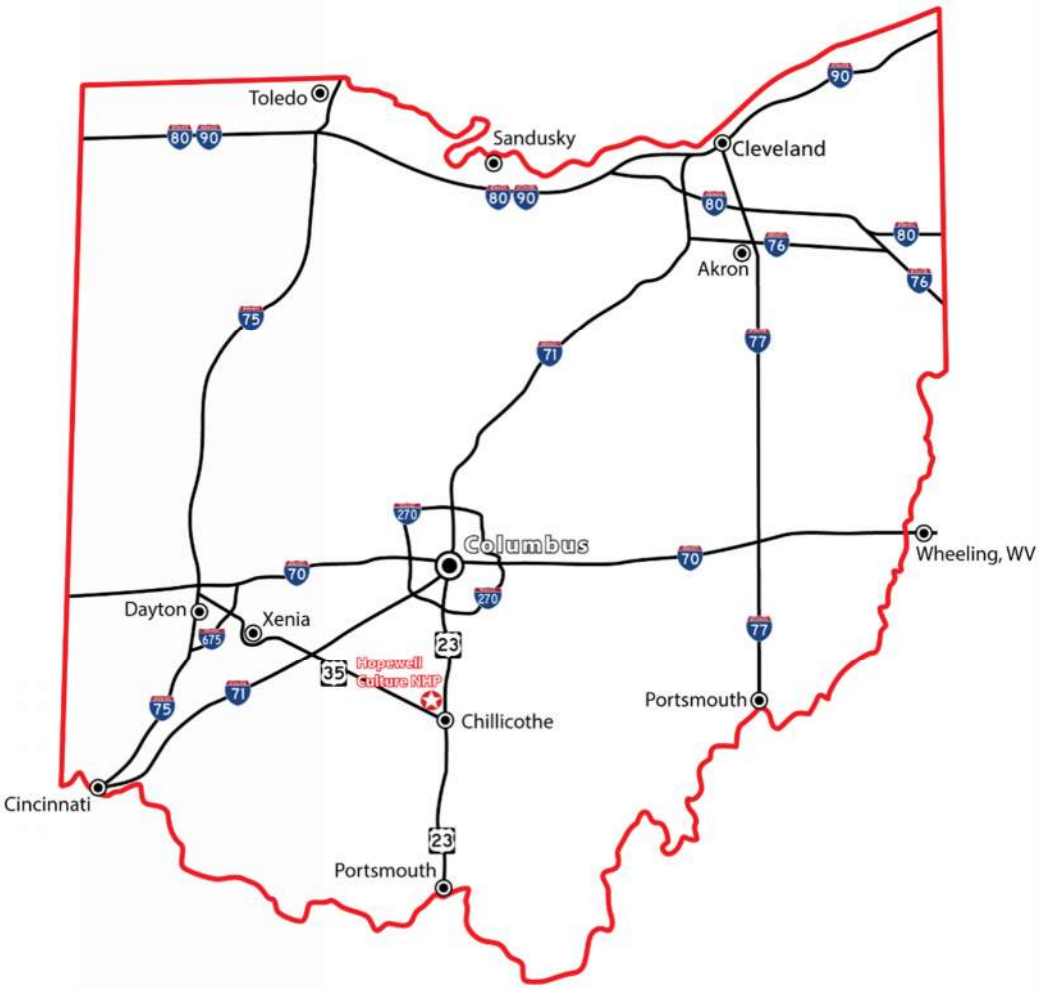


Figure 3.1. State map of Ohio. (NPS 2024)

A gravel drive runs from Sulphur Lick Road to the area east of the barn but does not have direct access to the barn. There is no designated parking area near the barn, but the edge of the gravel drive is utilized as such.

The barn has four doors: one pedestrian and three vehicular. On the west end of the north elevation, there is a sliding door approximately 14' wide and made of identical siding as the rest of the barn. The other three doors are all on the east elevation, with one vehicular door (+/- 8.5' wide) each on the north and south ends of the elevation and the pedestrian door (+/- 3.5' wide) near the center.

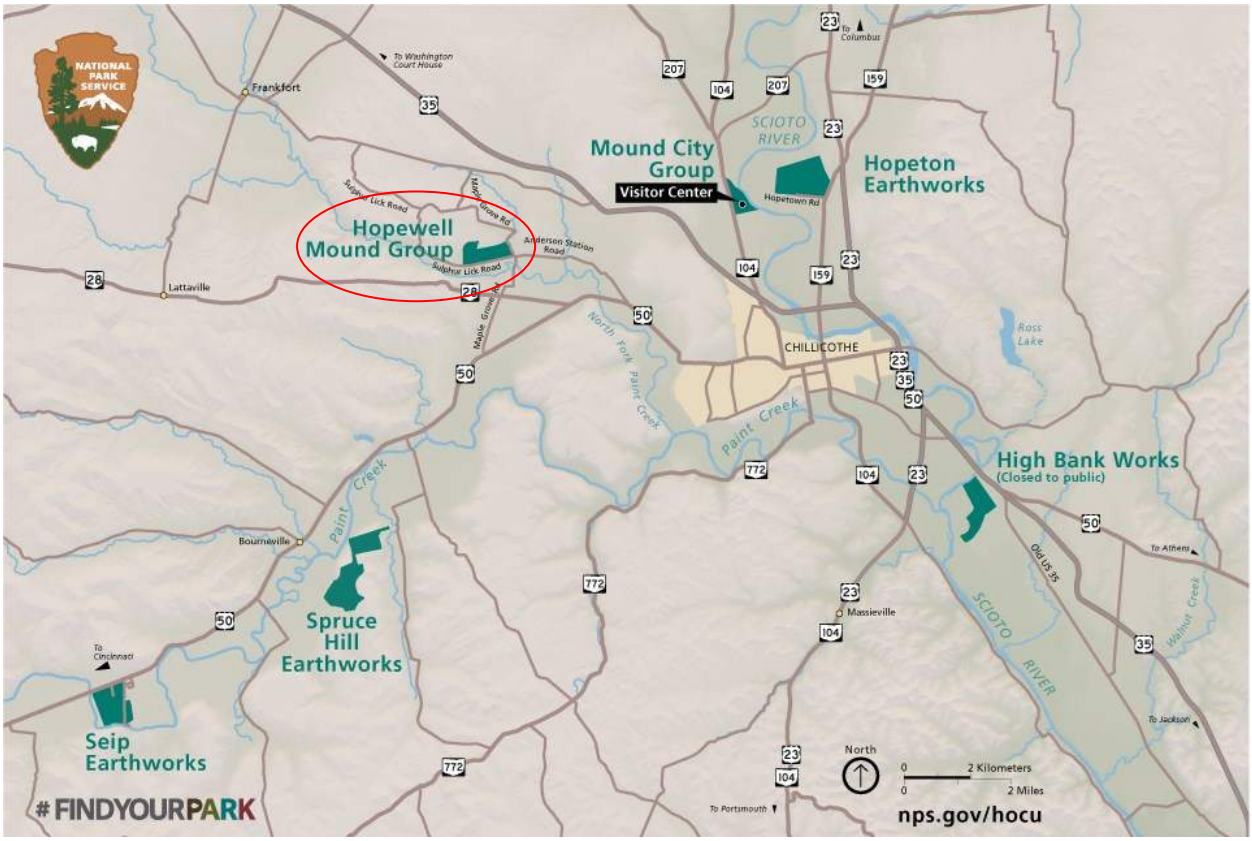


Figure 3.2. Hopewell Culture NHP Sites within Ross County. (NPS 2024)

The Carson-Steel Barn has a slightly rectangular footprint of approximately 52 feet by 40 feet. The primary façade faces east. The immediate surroundings of the barn have been cleared of overgrown vegetation and mowed by Park staff for the condition assessment.

The viewshed from the barn encompasses the majority of the Hopewell Mound Group to the north, northeast, and northwest; the neighboring farm to the east with contemporary house and outbuildings; and on the south, the viewshed only extends to the tree line immediately adjacent to the barn. The wooded bluffs are visible beyond the Hopewell Mound Group to the north. There is a large transmission line east of the neighboring farm, which runs generally north-south over the bluffs near the east edge of the mound group.

The sloped grade south of the barn appears to be gently eroding, resulting in the barn's south wall settling unevenly. A contemporary concrete apron on the east side of the barn leads to the south bay door. The sloped concrete apron is the width of the door and extends about 10 feet to the east. The grade at the perimeter of the barn is relatively flat, with no noticeable slope for water drainage. Grade has risen to cover the base of the wood siding boards in some areas along the northern sections of the barn.

Typical Barn Framing Terminology

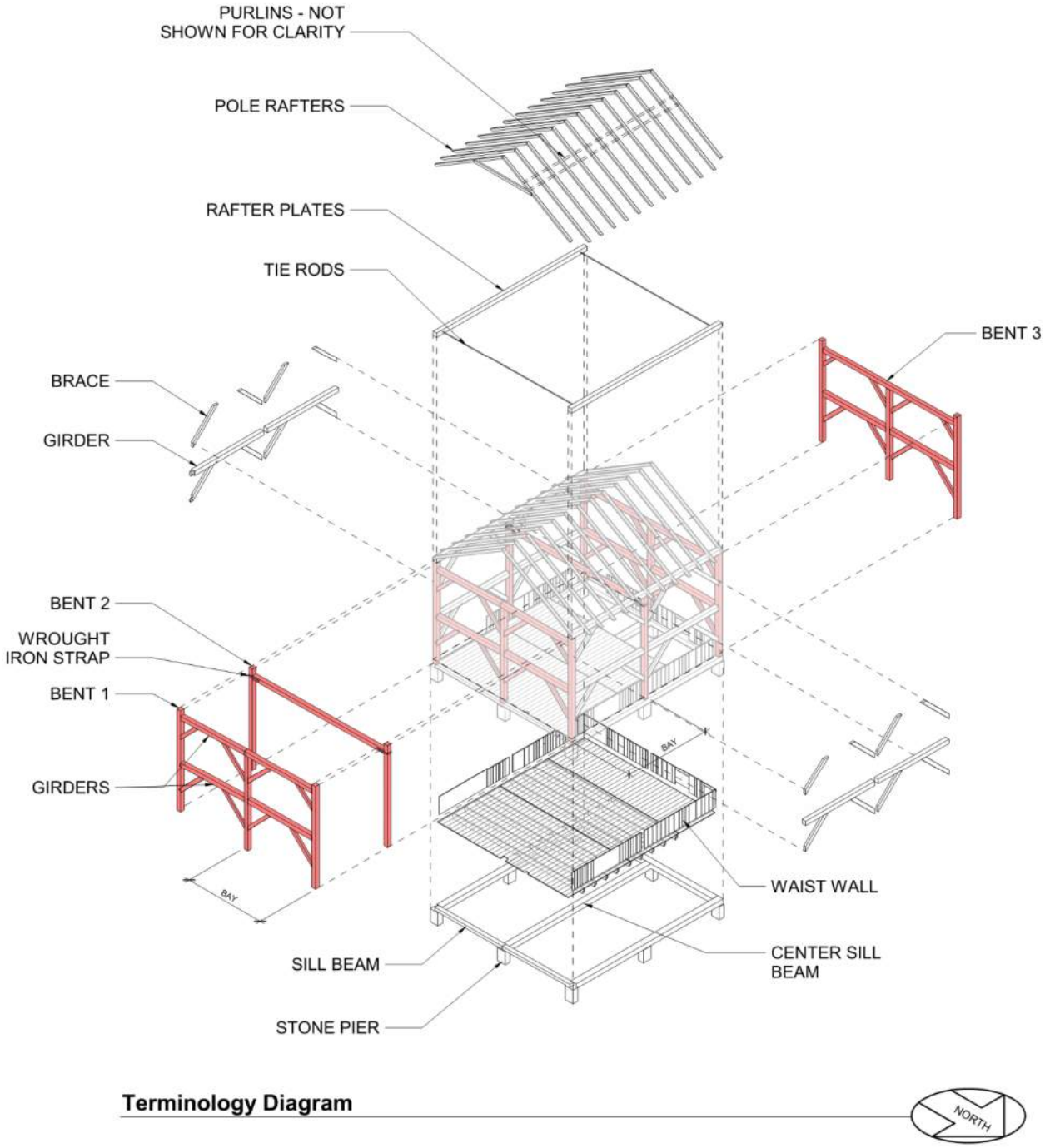


Figure 3.3. Axonometric Diagram of Typical Barn Framing Terminology. (STRATA 2024)

Stone Pier: Dry laid stacked stone, in some cases extending several courses below grade, in some cases resting entirely on grade.

Sill Beam: Primary structural member at the base of framed walls spanning between stone piers immediately above grade.

Post: Vertical heavy timber structural member.

Girt: Horizontal heavy timber structural member (also a girder).

Brace: Diagonal heavy timber member reinforcing connection of post and girt.

Bent: A frame consisting of all the posts, girts, and braces within a single plane. During a typical barn-raising, each bent is assembled on the ground and hoisted upright as one unit, where connecting girts, braces, and top plates are then connected in situ.

Top Plate: Horizontal heavy timber member running along the top of the wall frame (also a rafter plate).

Pole Rafter: Timber rafter that is not hewn, therefore maintaining the round cross-section and often irregular shape of the original tree.

Marriage Mark: Matching Roman numerals scribed on joints in Scribe Rule framed structures to identify matching timbers.

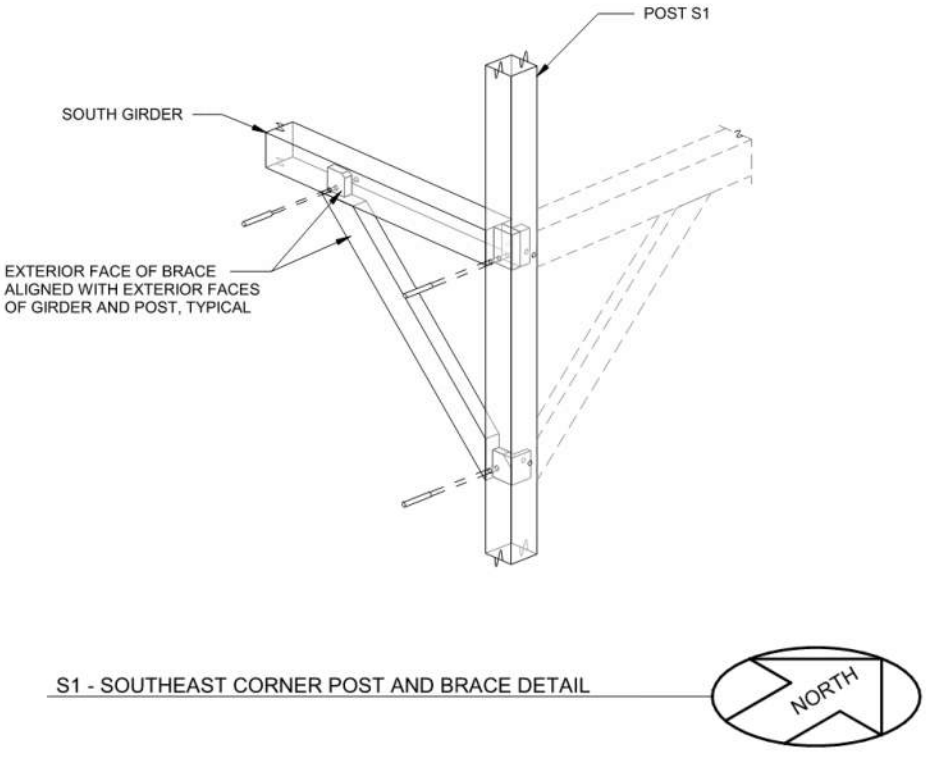


Figure 3.4. Detailed Axonometric Diagram of a Post, Girt, and Brace. (STRATA 2024)

Tenon: Projecting end of a piece of wood or other material cut to fit into a corresponding cavity or mortise.

Mortise: Hole or cavity cut into a timber to receive a tenon or other piece of material.

Peg: Pointed pin of wood, usually used as a fastener.

Shoulder: A projection or break on a piece of wood where its width or thickness changes.

Housing: Housing is a notch or groove cut into a piece of wood to receive another piece of wood, also called a trench.

Barefaced Tenon: A tenon with a shoulder cut on only one side.

Dendrochronology and Timber Framing Workshop

Dendrochronological testing of the heavy frame timbers and pole rafters was conducted during the October 25, 2023, site visit (Figures 3.5). The intent was to take samples to analyze the annual growth rings of the timbers to assist the team in dating the construction timeframe for the original section of the barn and the addition.

STRATA Architecture Inc. engaged Nick Wiesenberg from The College of Wooster Tree Ring Lab, Department of Earth Sciences in Wooster, Ohio, to provide the dendrochronology testing and analysis report. STRATA also engaged Raymond Friend of The Barn & Cabin Friend to discuss tree felling, timber framing techniques, and Scribe Rule framing methods.

Mr. Wiesenberg and Mr. Friend visited the Scribe Rule Barn during the AE site visit and led the hour-long framing and dendrochronology workshop with the AE Team and the HOCU park staff. Together, they showed a variety of tools that were used to fell trees and hew logs (converting a log into a timber), as well as tools that could be used to drill mortise holes in timbers.

During the site visit, Mr. Wiesenberg took twelve core samples with a hand-powered increment borer. Samples were taken from wood posts, pole rafters, sills, girts, and a brace, where outer tree rings were visible. The wood species for each sample were analyzed through a microscope and were found to be primarily white oak, with a few posts and the pole rafter of slippery elm. The girts, posts, sills, and a brace in the original barn were all white oak. The pole rafters of the original barn were slippery elm. The girt and rafters that were tested from the addition were white oak, with two posts noted as being slippery elm. The test results are outlined in a report in Appendix B.

The core samples were cross-dated with a COFECHA computer program, referencing dating among individual samples. The samples were then compared with independently established tree-ring master chronologies compiled from living trees and dated historical tree-ring samples. These samples are from old-growth trees and historical structures across southern Ohio. The dating results were verified by comparison with independent dating masters, and in each case, the dating reported was verified as correct.

The results show that the original (center) barn frame was cut and converted from trees felled in 1828, 1829, and 1830. The felling of the trees over several years may suggest this exercise was part of the original or early land clearance of the Hopewell Mound Group. Timbers sampled from the shed addition all shared an outermost ring of 1867. These results suggest that the barn builders likely commenced with building and raising the original barn around 1830-1831. The shed addition was likely completed in 1868.







Figures 3.5. Timber Framing Workshop and Dendrochronology Testing. (STRATA 2024)

Existing Conditions

The Scribe Rule Barn is a tall, single-story barn with lofts on three sides. The barn has a rectangular footprint of approximately 52 feet north-south by 40 feet east-west. The barn was constructed in two stages. The original ca. 1831 structure of the barn is 24 feet north-south by 26 feet east-west and remains as the core of the existing barn, with the east wall of the original barn centered on the east gable. The original heavy timber frame structure is a very tall single-story height, and the ca.1868 addition wraps around the south, west, and north sides of the original structure with lofts on all three sides and a shed roof on the west side. The primary façade faces east and consists of a single large gable. The ridgeline of the original structure is about 24 feet high, and the outside eaves of the 1868 addition are about 8.5 feet high.

The barn timber frame rests on stone piers at most post locations, with additional stone piers under the midspans of the sill beams on the original structure. The piers are primarily constructed of large, flat fieldstones of varying sizes and shapes. Visible stones appear to be local native limestone dry-laid atop a hard sandstone base stone. Piers may have been constructed on grade or slightly below grade and stacked to the desired height to raise the original barn structure slightly above the finished grade to keep the sill beams and interior floor framing dry and to provide ventilation below the framing and interior floor structure. The piers run at least three courses deep, with some stones visible and some below grade. Piers along the outer posts in the addition have been replaced with concrete in the 20th century.

The following sections of the report outline the existing conditions of the exterior and interior building components and systems. A diagram of the barn floor plan is included below in Figure 3.6, with the names of the interior spaces and the vertical posts individually labeled for clarity in the report.

Original ca. 1831 Barn Posts:

North Wall: N1, N2, N3

South Wall: S1, S2, S3

East Wall: EC

West Wall: WC

Ca. 1868 Addition Posts:

North Bay Wall: NB1, NB2, NB3, (NB4 added later)

West Bay Wall: WB1, WB2, WB3, WB4, WB5

South Bay Wall: SB1, SB2, SB3, (SB4 added later)

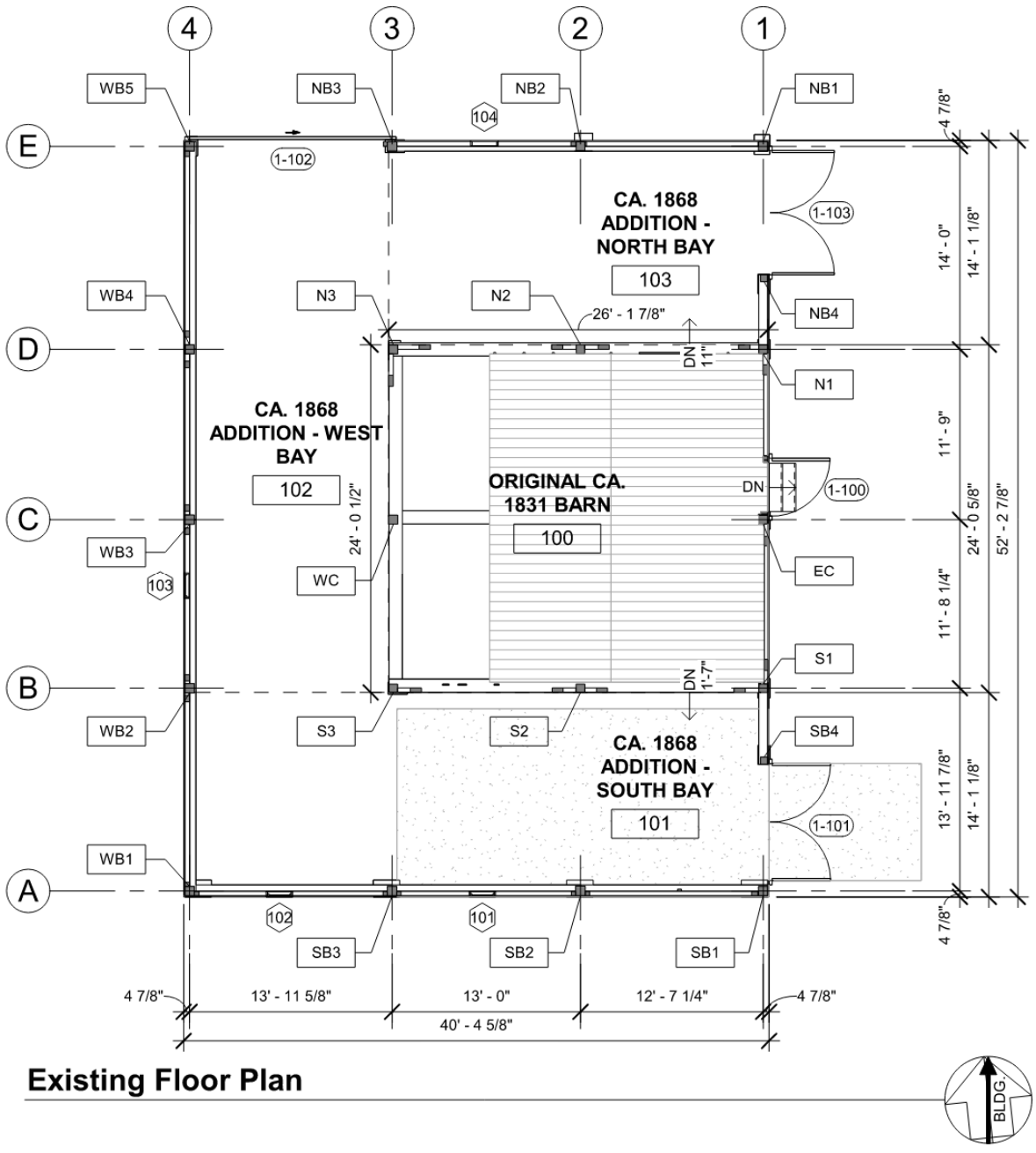


Figure 3.6. Detailed Post Labels. (STRATA 2024)

Stone and Concrete Piers and Concrete Slab

The original ca. 1831 timber frame barn structure was constructed to rest on a series of dry-stacked stone piers. Piers are approximately three stones high and were likely constructed directly over dirt with little sub-surface preparatory work. There are no footings under the piers. Due to the lack of footings, there has been some differential settlement of the main barn frame.

The stone pier at Post S1 is the only pier on the original ca. 1831 structure visible from the exterior (Figure 3.7). Stone piers are visible below the south sill beam from the interior of the barn (Figures 3.8).

Most of the piers in the ca. 1868 addition are visible from the exterior, in some cases because the siding was intentionally cut around the pier, and in some cases due to rodent or water damage at the siding, revealing the piers. The stone piers on the south, west, and north sides of the barn addition have been replaced with concrete piers (Figures 3.9 and 3.10).

The outside edge of an interior concrete slab in the south bay is visible below the wood siding at the base of the south wall between piers SB1, SB2, and SB3, with evidence of it being board-formed along the south edge. The concrete slab has visible loose brick fill underlay. The solid bricks are contemporary twentieth century and are wire-cut.



Figure 3.7. Sandstone Pier at Post S1 (east façade). (STRATA 2023)



Figure 3.8. Sandstone Piers at Post S2 (left) and Post S3 (right). (STRATA 2023)



Figure 3.9. Concrete piers and edge of interior concrete slab. (STRATA 2023)



Figure 3.10. Concrete piers at SW corner Post WB1 (left) and NE corner Post NB1. (STRATA 2023)

Interior Existing Conditions

The Carson-Steel Barn is a double-height, heavy timber-framed structure with mortise & tenon joinery of two separate vintages. The original ca. 1831 structure was constructed using the Scribe Rule technique of construction and measures approximately 25 feet east-west and 24 feet north-south with eave heights of approximately 14’-6." The ca. 1868 addition was built with the Square Rule method of construction, is 14 feet deep, and wraps the south, west, and north sides of the original structure with eave heights just over 8 feet. The addition has lofts on all three sides. Each vintage has distinct structural elements, but overall, the building is composed of heavy timber and smaller lumber elements, both hand-hewn and sawn, and pole rafters over the original section. At least two Square Rule joints in the original barn may indicate the transition between Scribe and Square Rule methods of construction. These are described further in the framing discussion.

The NPS acquired the barn property in 2002, and in 2014, the barn structure was stabilized. The deteriorated metal roof was patched with metal roofing panels, temporary purlins were installed, rafters were sistered, and bracing was added to address missing and weakened materials. In 2020, a strong windstorm peeled back a section of the standing seam metal roof panels, and a nearby tree fell into the structure, damaging rafters and the south wall framing of the south and west bays. Hence, a large section of the roof has been open for the last four years in the SW corner of the original barn structure and over the south and west bays that has allowed water and weather elements into the barn structure. This water infiltration has accelerated the deterioration of the wood timber and sawn framing in this area, causing a partial collapse of posts and horizontal framing members. This deterioration has resulted in unsafe structural conditions that may result in further collapse if not stabilized soon.

Elements Contributing to Wood Deterioration and Failure

Deterioration of wood timbers is from exposure to moisture, temperature (lack of conditioning), weathering, insects, and inherent wood species decay resistance.

Deterioration and decay throughout the barn stem mainly from water infiltration and exposure to the elements where roofing and/or siding are missing or have failed. Where wet, the timbers are prone to fungal decay.

The wood timber deterioration also includes pests, such as carpenter ants, powder post beetles, and rodents. Evidence of beetles and termites can be seen throughout the barn with small holes in the wood timbers. The south and west sill beams of the ca. 1831 barn and the base of Posts S1, S2, S3, and S4 are deteriorated and completely hollowed out from rodent infestation. It is possible these timbers were already decaying, allowing pests easy access to make a home within the wood. These are surprising in many instances, as the wood appears to be in good to fair condition on the outside, but they are entirely hollowed out. Old termite damage is evident in the horizontal nailer in the south bay of the east bent, and frass is evident throughout the framing in this area. No active insect infestations were seen during the survey.

Wood in contact with grade is also a contributing factor to the deterioration of several of the key timbers and siding. The main barn construction in ca. 1831 took great lengths to prevent the grade from coming into contact with the horizontal sill beams by stacking the stones high enough to allow for air ventilation below the members and beneath the interior first-floor framing.

- Grade along the west elevation is high and piled against the siding and sill beam.
- Grade in the center of the barn is also high in the area below the first floor in the center and also within the west bay.
- Grade in these locations is in contact with the sill beams and floor joists, causing significant deterioration.
- Grade is high in these locations due to several possible factors. The natural grade around the barn is slightly higher on the north and west sides than on the south and east sides. Livestock inside the barn likely moved around the soil, piling it up against the perimeter wood members. And under the first floor, critters living under the floor system, including groundhogs and other burrowing animals, often pile dirt in areas where it is in contact with the wood framing.

Overall, wood timber framing has failed in locations where it has been exposed to the elements or subjected to being in contact with grade. Areas that have maintained protection from the elements or are raised above grade remain in good overall condition. Failure has also started at joints that are under significant distress, where the tree damage in the southwest corner has resulted in framing being out of plumb and in a state of potential collapse. These failed members have added stress to the remaining surrounding members, especially on the mortise and tenon connections, where the members are attempting to pull out of the joints.



Figure 3.11. East Bent, looking east. Original ca. 1831 Barn Structure. (STRATA 2023)



Figure 3.12. South Wall, looking south. Original ca. 1831 Barn Structure. (STRATA 2023)



Figure 3.13. West Bent, looking west. Original ca. 1831 Barn Structure. (STRATA 2023)



Figure 3.14. North Wall, looking north. Original ca. 1831 Barn Structure. (STRATA 2023)



Figure 3.15. Center Beam and Roof in ca. 1831 Barn Structure, looking north. (STRATA 2023)



Figure 3.16. Center Beam and Roof in ca. 1831 Barn Structure, looking south. (STRATA 2023)

Original Ca. 1831 Barn Structure

The original section of the barn was confirmed to have been constructed ca. 1831 (Episode 1) with a recent dendrochronology test of the framing members. The barn is two bays wide and two bays deep. The barn is double height with 14-foot eaves and 24 feet to the ridge. While the barn is tall enough for two floors, it has never had a second level or loft. The floor is framed with 2x wood joists and a plank wood floor. Refer to Figures 3.11 through 3.16.

The barn was constructed with hand-hewn lumber (mostly white oak) using the Scribe Rule method of timber framing joinery. Each joint was specifically prepared with a mortise and tenon to match. The joints at the beams and braces are numbered with Roman numerals by the carpenter to indicate where they were to be installed as a perfect match. There are a handful of instances in the structural frame where mortises were started and not finished or where mortises were overcut, and wood wedges (pegs) were installed for additional friction.

The southwest corner and west bent of the original frame are in significant distress and could collapse at any moment. No shoring has been done to stabilize the building since the 2020 windstorm when a tree fell into the barn roof in the southwest corner of the historic structure. No entry into this portion of the barn should be allowed. Observation of the west bent and framing in the SW and NW corners of the original barn structure was not possible, as no ladders can bear in this area without risk. The park has posted warning signs for no entry into the barn to warn park visitors to stay clear. Every effort should be made to prevent entry, as a potential collapse is a serious life safety concern.

This section will consider the framing of the barn and the condition of the members.

Sill Beams: The hand-hewn sill beams run along the base of the perimeter at all four sides and rest atop the dry-laid stone piers. The four sill beams are tied to one another at the corners with mortise and tenon joints. The eight vertical posts are tenoned into the top of the sill beams. The sill beams are 11" wide x 9-1/2."

- **Condition:**
    - The east sill beam is in fair condition. There is some deterioration at the SE corner where the Post S1 is located.
    - The south sill beam appears to be in fair condition; however, upon further investigation, the entirety of the sill beam is hollow inside. The beam has been routed out by pests and rodents and offers virtually no structural support. The west end of the beam is severely deteriorated due to exposure to the elements from the opening in the roof.
    - The west sill beam is deteriorated throughout. The beam has been in contact with the grade and is also exposed to water from holes in the roof.
    - The north sill beam is in good condition, except for the very NW corner where Post N3 has buckled and is deteriorated.

Posts: The eight perimeter posts are continuous from the sill beam to the underside of the rafter plate. Therefore, the mid-level (hay loft level) perimeter girders are single-span between posts and framed into the sides of the posts via mortise and tenon joinery.

- **Condition:**
    - Posts N1, N2, and EC appear to be in good condition overall.
    - Posts S1 and S2 have deteriorated and appear to be hollow near their base, affecting the strength of their tenon connections into the sill beams. However, the upper portions of the posts are in good condition.
    - Posts S3, WC, and N3 are in overall poor condition with significant deterioration at the base and along the length of the posts due to structural failure and/or exposure to the elements.

Girders: Where two girders (horizontal framing members) meet at a corner post, the two mortises meet to form an L-shaped cavity within the post to receive the two perpendicular members. Where two girders meet at the central post, the mortise is through the entire depth of the post so that the two adjoining tenons meet.

Post / Girder Connection: The typical girder-to-post connection appears to be a two-shoulder, centered mortise and tenon connection, where the sides of the connecting girder or post are removed, the depth of the tenon matches the depth of the connecting element (girder or post).

Bay Layout: All four elevations of this central double-height space are framed out by a two-bay knee brace system, where 8" x 8" (nominal) girders span between 8" x 8" (nominal) timber posts at both the eave line (at approximate elevation 23’-6" above the first-floor level) and at the mid-level elevation (now the hay loft level, at approximate elevation 7’-3" above the first-floor level).

Each bay is approximately 7 feet high and 13 feet wide along the north and south elevations and 7 feet high and 12 feet wide at the east and west elevations.

Braces: Similar to the post-girder connections, the diagonal knee braces are tenoned and frame into mortises created into the posts and girders to which they join. At corners where the ends of braces join the posts, the two mortises in the post meet to form an L-shape cavity. Where the braces meet at a central post, the mortise is through the entire depth of the posts so that the two adjoining tenons meet. While the girders are centered on their supporting timber posts, the diagonal braces are aligned with the exterior-outward edges of the posts. Therefore, while the girder tenons are centered within the depths of the girders, the tenons created in the braces are aligned with the interior-inward edges of the braces to ensure the tenons are framed into the centers of the posts.

At a 45-degree angle and 4 feet from the top of the posts in both directions, 4" x 6" (nominal, average size) diagonal knee braces frame between the horizontal girders and the vertical posts to provide lateral resistance for the building against horizontal loads. There are two sizes of braces in the original structure.

The upper and lower north braces at Post EC were removed when the upper hay loading door was installed. The mortises are still visible. The tenon remains in the top of the lower brace location.

- **Condition:** The conditions of the braces varies by location. Generally, braces in the central and eastern portions of the structure are in good condition. Braces on the west bent that tie into Posts S3, WC, and N3 are in poor condition.

Center Beam: A central north-south 8" x 8" (nominal) tie beam spans between the timber posts along the north and south elevations approximately 1 foot below the tops of the posts. This central beam spans clear across the double-height space and is strapped to the central posts via a wrought iron U-shaped brace that wraps around the post and is anchored to the ends of the girder with square bolts. It serves as a bracing element for the posts as horizontal loads rack the building along its north-south length. This strap may be original or evidence of an 'early' repair. This strap transitions the beam to act like a tension tie to prevent the posts from moving outwards.

- **Condition:** The center tie beam at the top of interior space appears to be in good overall condition.

East-West Rafter Plates: At the roof level, the north and south roof plates are continuous, double-span elements that run east-west and sit over the top of the corner and central posts. The rafter plates are joined to these column tops by blind mortise and tenon joinery, where the underside of the rafter plate is hollowed out into a mortise to receive the top of the column tenon.

Metal strap repairs with bolts have been added to the west side of both the north and south rafter plates. These appear to be some type of corner repair to keep the rafter plate attached to the corner posts or to connect the added upper roof rafter plate from the ca. 1868 addition (Figure 3.17).

- **Condition:** The east-west rafter plates are in good condition for most of their length. However, at the west end of the south and north rafter plates, there is significant deterioration. These areas have been exposed to the elements from the hole in the roof. Due to access safety issues, the condition was not able to be verified up close. Both ends appear to have failed.



Figure 3.17. Photograph of the Post N3 failure where the north rafter plate, the west bent girder, and the west roof rafter plate above (from the ca. 1868 addition) all meet. Note the new lumber is from the 2014 stabilization project. The roof flashing in this valley has failed, allowing significant water infiltration into this corner. (STRATA 2023)

Unique Framing at Corner Posts and East-West Rafter Plates: Timber framer Rudy Christian with Christian & Son first studied the barn for the park in 2014.[172] He noted that this barn was likely constructed during a time when Scribe Rule framing was giving way to the Square Rule framing as the dominant timber framing technique. He evidences this by describing a unique connection between the original corner posts and the upper east-west rafter plates. He states:

> *Careful study of the wall plate at the top of the photo reveals* [Figure 3.18] *that wood has been removed from the entire lower surface to accommodate the mortice and tenon joint where the post is connected to it. A wooden peg can be seen in the plate just above the post which secures the mortise in the tenon connection. This is typical of square rule layout and appears in at least one other location in the frame. There is no question all three timbers are part of the original frame and yet they show evidence that the timber framer was aware or and willing to try the modern square rule system of joinery layout.*



Figures 3.18. Post S1 at the southeast corner of the ca. 1831 barn structure. Rudy Christian notes that this joint indicates that the carpenter understood Square Rule joinery and was not opposed to trying it while building a Scribe Rule barn. (STRATA 2023)

[172] Christian, April 2014.

North-South Girders: The east and west girders span north-south continuously over the central posts and are joined to these columns via blind mortise and tenon joinery, similar to the north and south rafter plates. They are installed approximately 1'-0" below the tops of the corner posts and frame into the sides of the corner posts via mortise (in the posts) and tenon (in the girders) joinery.

- **Condition:** The north-south girder on the east side is in good condition. The north-south girder on the west side is severely deteriorated and is failing.

Tie Rods: At the east and west gables, two iron tie rods with central turnbuckles that span north-south are installed above the corner posts. The rods are installed through north and south rafter plates. Because the rafter plates do not have any central bracing, the tie rods have caused some inward rotation of the rafter plates. The age of the tie-rods is unknown, as they were inaccessible during the assessment. They may signal a later repair.

- **Condition:** The tie rods appear to be in good condition.

Roof Framing: The central original portion of the building has a gabled roof with a ridge that runs east-west.

- **Condition:** The roof structure and cladding of this central portion are in good condition with little to no obvious signs of damage or instability except in the very far southwest corner, where the roof was damaged from the tree fall.

- **Pole Rafters:** The roof framing is composed of approximately 4" to 5" diameter (nominal, average) slippery elm pole rafters @ approximately 24" to 26" on center, which bear on each other with no ridge beam at the central peak of the gable and then span to the perimeter 8" x 8" (nominal) timber rafter plates. The pole rafters are all finished on the ends flat to receive a soffit that is not present.
    - **Condition:** The pole rafters appear to be in good overall condition. The original western-most pole rafter has been replaced with contemporary framing as part of the last stabilization effort.

- **Purlins:** The 1x4 wood purlins (skip sheathing) are laid flat over the top of the pole rafters at approximately 9" to 12" on center and are topped with metal standing seam roofing.
    - **Condition:** The condition of the purlins varies. Some are in good condition, while others appear to have deteriorated. There are several locations where newer purlins are seen adjacent to older, deteriorated purlins. Purlins are present for most of the roof area, but they are missing from the westernmost rafter bay, where there are temporary roofing patches and holes through the roof.

- **Gable Walls:** The triangular gable ends at the east and west elevations are sheathed in wood paneling down to the perimeter top girders. Paneling in the east wall is the continuous siding that clads the entire exterior. Wood siding in the west bay are vertical, wide, random-width boards that may be remnants of the original ca. 1831 barn siding.

They are clad on the exterior with rectangular metal panels and flashing that appear to have been installed when the standing seam metal roof was installed.

- **Condition:** Due to the instability of the west wall framing, the siding boards could not be closely examined. The base of the boards is deteriorated, as flashing in this area may be allowing water infiltration.

Horizontal Nailers: The exterior of the perimeter walls of the overall barn (ca. 1831 and ca. 1868) are planked with V-joint tongue and groove box car siding. The planks are nailed to the knee-braced frame. There are nailers at mid-height of the east wall (below the knee braces' connections to the posts) and above the second-level girders (also below the knee braces), to which the exterior planks are attached. The nailers were installed to attach the siding and are not original to the ca. 1831 construction. They are toe-nailed into the historic framing.



Figure 3.19. Center east-west first-floor sill beam supporting the first-floor joists. The east-west sill beam in the background is also notched to support the floor joists. (STRATA 2023)

First Floor and Framing: The first floor within the central original barn is slightly elevated above the surrounding grade and is framed with a center east-west sill beam and floor joists that span north-south on either side of the beam (Figure 3.19).

- **Center Sill Beam:** The hand-hewn center beam is 11" wide x 11-1/2" deep. Due to the deterioration at the west end of the center beam, it is difficult to determine if the center beam is joined to the north-south beams at the east and west sides of the barn. During the AE Team assessment, wood flooring was removed at the east side of the room

along the outer wall to reveal this juncture, and the center beam does not have a visible connection to the north-south beam. They are, however, sharing the center stone pier for support.

- **Joists:** The circular-sawn joists are 2" x 9-1/2" at 24" on center and bear in notches within the central east-west beam and also bear in notches at the north and south 11" wide x 9-1/2" deep hand-hewn sill beams.
- **Flooring:** The floor boards of the center floor are typically 1-1/4" thick x 7-1/2" wide and are tight-laid. They are installed with cut nails. The existing boards show multiple nailing patterns. Boards are a combination of sash-sawn and circular-sawn.
- **Condition:** The hand-hewn east-west center beam is buried in the earth from the center of the beam to the west end, and that, along with water infiltration at the south and west sides of the roof, has resulted in dry rot along the west side of the beam. It is also likely that animals, such as groundhogs, have burrowed beneath this floor structure, piling dirt against the beam and joists. Park staff noted that the western section of the missing flooring was removed by park staff due to severe deterioration out of respect for safety concerns.

Overview of the ca. 1831 Original Barn Structure:

West Bent Failure: While the east, north, south, and center framed bents and walls are in fair condition, the west bent is in significant distress.

- The collapse of the southwest roof and exposure to the elements (see "Lofted Addition" section in the ca. 1868 discussion below for more information) has caused the southwest timber Post S3 to fail. As this column has failed, the west and south girders framing into it have also failed.
- Post N3 in the northwest corner has also failed due to water infiltration.
- The north and south rafter plates have been retrofitted with metal clips to anchor them to these posts and the ca. 1868 upper west rafter plate. Due to the exposure to the elements, all of these systems have failed from the top down.
- The south and west loft girders are visibly deflected in a downward direction toward the west, destabilizing the rafters and loft joists they support.
- The entire south bay of the west bent has failed. All four diagonal braces are missing, and both the top and mid-level girder are no longer supported at either end.
- The north bay of the west bent has two knee braces still intact, but both are no longer properly seated into their mortises. The rest are missing.
- Both the top and mid-level girders of the west bent are visibly deflected as well, and the central post appears to have shifted due to the collapse of the southwest corner of the building and deterioration of the sill beam where it is bearing.

Sill Beams and First Floor Framing Deterioration: Another area of concern is the elevated first floor and post bases. The sill beams around all four elevations appear to be in fair to poor condition. The west and south sill beams have failed and are hollow for most of their lengths. Likewise, the lower portion of the posts resting over these perimeter sill beams

also sound hollow. This deterioration signifies that the mortise and tenon connections between the posts and sill beams have failed in these locations.

Differential Settlement: The ca. 1831 barn structure has experienced differential settlement. This is due to the dry-laid stacked stone piers being directly constructed on the soil with no subsurface preparation or footings. Overall, the settlement is not significant, but it does range from 1 to 2 degrees between posts.

Ca. 1868 Barn Addition

Around 1868, the U-shaped, 14-foot-wide bay extension was added around the south, west, and north sides of the original ca. 1831 barn. The addition was constructed with the newer Square Rule method of framing, meaning the frame components are meant to be interchangeable. There is less attention to joinery detailing in the addition, as the joinery has less shoulders and more visible connections than the Scribe Rule connections in the original barn structure. Timbers used in the construction of the addition are a combination of hewn and circular-sawn. Some lumber may also have been salvaged from other buildings or even from the original ca. 1831 barn structure (Figure 3.20). The addition was framed in a similar manner to the original barn, with posts resting on sill beams, topped with a continuous rafter plate, and girders between the posts to support three loft areas. The nailers, braces, and loft girders are connected to the perimeter posts by means of mortise and tenon connections.

The U-shaped addition may have originally been constructed to be open air to the barnyard with no siding or enclosed as it is currently. There is no documentation of the ca. 1868 original configuration showing how the barn was used or where doors were located. It is assumed there were always openings in the east wall and in the westernmost bay of the north wall, where there are no braces installed that would impede the openings.



Figure 3.20. Typical framing in the ca. 1868 addition includes a combination of hewn and circular-sawn lumber. Some appear to have been salvaged from another structure and reused here. (STRATA 2023)

Pier and Sill Beam Alterations: The original stone piers supporting the sill beams and posts in the ca. 1868 addition were replaced with concrete piers at an unknown time. When this occurred, it is likely that the bases of the posts were cut and shortened to receive the existing sill beams, which rest atop the concrete piers. The newer piers are higher in elevation than the original stone piers.

Sill Beams: The sill beams provide the base framing for the perimeter walls at the east, south, west, and north sides of the addition. The beam sizes vary from 4” x 8-1/2” to 5-1/2” x 7-1/2.” Many of the sill beams appear to have been installed when the concrete piers were installed. The joinery at the sill beams varies. At the SW corner, they are stacked. The sill beam at Post SB4, adjacent to the south bay doors, has metal straps connecting the wall to the concrete pier (Figure 3.21). Because the doors are framed into the post, the end of the sill beam and post here was likely unstable due to the door movement. These straps were likely installed to provide some rigidity to this door opening.

Condition: The sill beams are in varied conditions. Where the south wall is damaged, the sill beam is deteriorated. Where the west wall is damaged, the sill beam is deteriorated. A section of the sill beam along the north wall is also deteriorated.



Figure 3.21. Post SB4 at the south bay door opening on a concrete pier. Note the metal straps to the pier to stabilize the door opening. (STRATA 2023)

Posts: The posts throughout the addition are a combination of hewn and circular-sawn. Posts at the perimeter of the addition, SB1, SB2, SB3, WB1, WB2, WB3, WB4, WB5, NB1, NB2, and NB3 are 8x8 posts resting on a sill beam. SB4 and NB4 posts that frame the bay doors in the east wall may be newer and are 6x6. These newer posts are notched to receive the girder

framing on the top of the door opening in a way that no other framing is supported in the barn. Posts SB1 and SB2 in the south wall may be replacement posts.

Condition: Posts are in various conditions, from very poor to good, depending on their exposure to the elements. Posts SB3 and WB4 have failed due to tree damage and/or exposure.

Girders: The timber girders align with the location of the original ca. 1831 barn posts and span between these posts and the new ca. 1868 posts at the perimeter of the addition. The girders have mortise and tenon joints and are set just below the ca. 1831 girders so as not to interfere with the original post and girder joinery at the main barn frame. The new girders support the loft above and also provide some lateral support for the perimeter posts and rafter plate. See Figure 3.22).

Condition: The girders are generally in good condition, except where exposed to the elements in the southwest corner of the structure.



Figure 3.22. Ca. 1831 Post N2 (left) and ca. 1868 Post NB2 (right) with ca. 1868 girder spanning the two. It is mortised into both posts and rests below the original ca. 1831 girders. (STRATA 2023)

Braces: Braces throughout the addition are of varying sizes, and some appear to be reused from a previous building, as they have notches and evidence of previous fasteners. The braces are mortised into the posts. There are braces at each perimeter post, except at Post WB5, where there is no brace at the sliding barn door. There has never been a brace in this location, indicating this was likely constructed to be an original door opening. There are also no braces on the east wall of the south and north bays, also due to the doors.

Condition: The brace at Post NB3 on the north wall is completely deteriorated from water infiltration, as is all of the framing in this wall section (Figure 3.23). The braces at Post WB4 have failed, along with the post, also due to water infiltration. Brades at Post SB3 are also deteriorated where the tree landed, and the wall is open to the elements.



Figure 3.23. Deteriorated brace at Post NB3, deteriorated rafter plate above, and deteriorated sill beam below. This is due to water infiltration issues at this north eave. (STRATA 2023)

Horizontal Nailers: Horizontal nailers are used to support the exterior vertical V-joint tongue and groove siding. These are similar to the nailers installed on the east wall of the ca. 1831 structure. This may indicate that the siding was installed all at the same time.

Rafter Plates: The perimeter roof rafters of the addition are supported with rafter plates. These are continuous timbers the length of the perimeter with very few seams. The rafter plates are joined to the posts by several methods. They are either mortise and tenon joints into the sides of the posts, notched to lay on top of a post, or fully rest on top of the posts. There does not seem to be any pattern for how these were installed.

> **Condition:** The rafter plates are in very poor to good condition, depending on their exposure to the elements. Where the roof and flashings are missing, the rafter plates are deteriorated along the south, west, and north walls.

Roof Rafters: The roofs over the north and south extensions follow the slope of the original central gable roof and consist of 2 x 6 rafters at approximately 24" to 26" on center, which bear on the perimeter 8" x 8" (nominal) timber top girder of the central portion and perimeter 6" x 6" (nominal, average) rafter plate over the perimeter exterior walls. The metal roofing spans to 1x purlins at approximately 9" to 12" on center that is laid flat over the top of the rafters. Where the southwest and northwest roof slopes meet, there is a hip girder that frames between an original 8" x 8" timber post within the building and an 8" x 8" (nominal) corner post along the perimeter elevation walls. Rafters are exposed on the exterior eaves. The lack of a drip edge on the metal roofing has resulted in water runoff onto the ends of the rafters, exposing them to further deterioration.

Condition: The roof rafters are in very poor to good condition, depending on their exposure to the elements. Rafters in the southwest corner, where the roof is missing, where the roof has failed in the northwest corner, and along the perimeter of the addition have resulted in deteriorated rafters that cannot be repaired.

Hayloft Framing: There is a planked hayloft level where the roof's eave meets the top of the perimeter walls, roughly 7 feet above the central elevated first-floor level. This level is framed with 2x6 (nominal) joists at 24" on center and spanning to heavy timber girders of variable sizes. The hayloft flooring is installed with 1-inch-wide gaps between the boards to allow for air circulation. The boards are 15/16" thick and are circular sawn. Some floor boards are quite wide, reaching dimensions of almost 24 inches. There are three sections of hayloft in the south, west, and north bays. There is no loft present in the southwest and northwest corners of the addition. The hayloft was likely used for hay and other feed and implement storage. The south hayloft is accessible by the built-in ladder on the east wall.

Condition: The hayloft framing appears to be in good condition, except where exposed to the elements where the roof is missing or leaking.

Overview of the ca. 1868 Addition:

As mentioned earlier in this report, the entire southwest corner of the building has collapsed. The roof is caved in where the tree fell. The majority of rafters in the south roof area have fallen, and the southwest hip beam has failed. The center portion of the perimeter south wall has also collapsed with deteriorated and destroyed rafter plate, post, and sill beam timbers. There appears to have been some differential settlement around the building, most notably along the west and south elevations, where the posts appear to have shifted.

There is a portion of the west wall where a Post WB4 has failed, leaving the girder it was supporting cantilevering without an end support. During the AE Team site visit, the NPS placed a brace under the end of the girder to prevent the collapse of this portion of the west wall.

The north wall is also in very poor to good condition. The bay between Posts N2 and N3 is severely deteriorated due to water infiltration.

Interior Building Elements:

Built-In Ladder: The built-in ladder along the east wall of the ca. 1831 structure may be original. This would have been used to climb high to the top of the nearly 2-story hay stacks and later to access the adjacent hayloft. The vertical ladder frame is 3-7/8" x 1-3/4," is sash-sawn, and appears to be early. The top/north section of the ladder frame is loose and is not connected to the horizontal girder. The very top ladder rung is circular sawn lumber and is 2-3/4" x 1-1/4." The remainder of the top ladder rungs are missing, but they were installed on the face of the corner post S1, as witnessed by the remaining nail holes. The rungs on the bottom portion of

the ladder below the girder are installed on a nailer that is flush with the corner post. These are not original. They are repurposed tongue and groove wood flooring and are 1" thick.

Condition: Some ladder components are stable, but overall, the ladder is unsafe and requires repairs.

Waste (Waist) Walls: The interior partial (waist)-high knee walls are constructed of random-width vertical board walls nailed to a horizontal 2-1/8" x 3-3/4" wood rail that is nailed to the vertical posts. The wall is approximately 29" high above the interior finished wood floor. The waste walls were constructed along the south, west, and north walls of the center ca. 1831 section of the barn. These appear to have been installed at the same time as the interior floor structure, or earlier, and may be original to the construction of the barn. The boards are sash-sawn, with some being nearly 24-inches wide. The top rail and top edge of the board wall are worn from years of livestock eating from the adjacent mangers.

Mangers: Wood mangers line the north and south waste walls and were used by livestock in the north and south bays of the addition.

Condition: Large sections of the waste walls and the mangers were cut out to have access from the north and south bays into the center of the barn. Sections of boards are missing and deteriorated throughout the three walls, especially along the west bent.

East Door Frame: Door 1-100 into the ca. 1831 portion of the barn is a later addition. The door buck (frame) is salvaged timber from elsewhere that measures 3-1/4" square and was installed to create the door frame between the buck and Post EC. Additional trim was added, and the existing door is temporary.

Miscellaneous: Miscellaneous debris is stored in the southwest corner and throughout the barn, which may include missing pieces of timber or wood boards. A V-joint tongue and groove board door is stored in here, which likely fits the size to infill the hay loading door in the upper east wall.

Existing Exterior Architectural Conditions

The Scribe Rule Barn is rectangular in footprint with a center gable running east-west and a shed roof along the west side. Shallow overhangs with exposed rafters are on the south, west, and east sides. There is no overhang on the east side gable. The main entrance is centered on the east façade. The barn is clad in vertical V-joint tongue and groove boards and topped with a metal standing seam roof.

A storm in 2020 caused one of the nearby trees to fall on the southwest corner of the barn, creating a large hole in the roof of most of the southwest part of the addition and extending to the southwest corner of the original structure (Figure 3.24). This has resulted in partial failure of the center-south portion of the south wall and interior posts and framing where the hole allows water to enter. Aside from the storm damage in the southwest corner, a leak in the northwest roof intersection, and deterioration at the eaves, the exterior finishes of the barn are in overall fair to poor condition.



Figure 3.24. Detail of storm damage at the south roof. Note that the photograph shows Post S3 with the iron tie rod exposed on the outside face of the rafter plate. This exposure to the elements is causing significant damage to the structure inside. (STRATA 2023)



Figure 3.25. Overall east elevation. (STRATA 2023)

Exterior Cladding, Trim, Doors, and Windows

The exterior cladding consists of vertical board siding, temporary doors, a sliding wood board door, and various types of exterior trim. The siding is vertical, V-joint tongue and groove board with beveled edges that create a V-groove when matched together and a V-groove down the center of the board. The siding and trim are painted white. Many of the boards are full height at the east side of the building, with some boards spanning up to 20 feet. There are very few horizontal seams. The base of the siding is scribed around the pier stones in several locations and is in poor condition from moisture and rodent damage. The siding is installed directly to the horizontal timber framing, and the back side of the siding is visible inside the barn. The inside face is natural, with no paint finish. The siding throughout is deteriorated and has knots that are missing. The siding is attached with two sizes of round nails. The age of the siding is unknown, but it was installed by 1922, as seen in a historical photograph (Figure 3.26).

The exposed rafter tails along the south, west, and north eaves are in poor condition, with the ends of the cut rafters exposed to the elements. There is no fascia board, and no evidence suggests there was ever a fascia installed. There is also no evidence of gutters being previously installed along the edges of the eaves, except for the north side of the roof. The lack of gutters results in rain rolling off the metal roofing very quickly, hitting the grade, and splashing back onto the wood siding. This splash-back has inevitably contributed greatly to the deterioration of the siding. Remnants of old vines remain clinging to the siding on the south, west, and north walls.

Overall, the paint on the boards and trim is in poor condition, with large areas of exposed, unfinished wood and peeling paint. There do not appear to be many layers of paint on the siding. Hazardous materials testing was not completed as part of this study; however, due to the

age of the structure and the siding, it should be assumed that all painted surfaces contain lead and that the soil in the drip line around the barn may also contain lead from the deteriorated paint.

Window openings in the exterior walls are small and have little detail. The south and west openings have interior framing to create the opening, exterior trim, and wood sashes. The north window does not. All openings are covered on the interior with a contemporary wire mesh stapled to the inside of the openings.



Figure 3.26. A detail of a photograph from 1922 shows the barn with vertical siding and a standing seam metal roof. (1922 Shetrone)

East Façade: Siding on the east façade is in overall fair to poor condition (Figure 3.25). Most of the bottom edges of the boards have been eaten by rodents for access into the barn or are deteriorated. The east façade also includes three areas where missing or deteriorated siding has been patched by plywood: one large section next to the southern bay door and small areas near grade on either side of the central pedestrian door.

There are three ground-level door openings and one loft access door opening on the east façade. All openings are protected with temporary unfinished plywood doors in poor condition. The north bay door is the only one with visible header trim that appears to be contemporary and capped with a similar horizontal rail to the south of the loft access

door. The type and configuration of the original doors are not apparent from the existing construction. They may have been constructed of the same siding installed throughout the exterior, like the north sliding door. There is a set of contemporary wood-framed steps to the main central entrance (Figure 3.27).

There is no overhang on the east side gable, with only a small barge board along the rake. The barge board has deteriorated.



Figure 3.27. Detail of central entrance door with wood steps. (2023 STRATA)



Figure 3.28. Overall south elevation shows significant structural failure. (STRATA 2023)

South Elevation: The wood siding on the south elevation is in overall fair to poor condition despite underlying structural issues (Figure 3.28). There is minor rodent and water damage at the base, and the siding directly around the failed Post SB3 is in very poor condition, as this section of the wall has partially collapsed. The siding in this area is separated from ground level by the edge of the interior concrete slab. A large plywood patch is on the southeast corner, and some sections of siding are missing.

A small, high window opening 101 cased with flat trim remains centered in the west bay portion of the wall. The sash remains, but there is no glass. A second window opening 102 is visible in the center of the collapsed section of the wall that is located just west of center in the south bay. The components of the window are not likely salvageable.



Figure 3.29. Overall west elevation. (STRATA 2023)

West Elevation: Wood siding on the west façade is in overall poor to very poor condition (Figure 3.29). Along portions of the building, the grade is in contact with the bottom of the siding. There is extensive water and pest damage along the base of the entire wall.

Due to an underlying failure of Post WB4, a section of siding has fallen off the building, allowing entry into the structure by both animals and persons.

A small Window 102 is located just south of center within the west wall (Figure 3.30). Trim remains at the top and sides, but it is missing at the bottom. The sash currently has contemporary screening installed on the interior face.



Figure 3.30. West Window 103 Opening. (STRATA 2023)

The upper west-facing gable above the hipped shed roof has been clad in flat, rectangular metal sheets installed in a staggered pattern (Figure 3.31). These very likely date to when the metal roof was installed and are painted to match the roof. These metal sheets cover what is very likely the only original vertical wood siding remaining from the ca. 1831 barn construction. The vertical, random-width, wide-board siding is visible from the interior of the barn (Figure 3.32). Some of the boards are close to 24 inches in width. The siding appears to be attached to the original rafters, the original top collar, and to more contemporary horizontal nailers installed when the ca. 1868 west addition roof was installed. The siding boards were likely cut to length to end just above the new finished roof line. The bases of the boards are deteriorated where the flashing between the metal panels and the roof has failed. Due to the height of the gable and the failing timber framing in this location, access to view the siding was not possible due to life safety challenges for ladder supports. The siding should be carefully assessed during the structural stabilization process. The small flat wood barge boards at the rake appear to have been partially clad in metal, which is mostly missing. The barge boards are exposed to the elements and are in poor overall condition.



Figure 3.31. West elevation gable with siding clad in metal panels. (STRATA 2023)



Figure 3.32. Interior view of west gable siding. Note the original collar tie and two contemporary horizontal nailers for stabilizing the siding. (STRATA 2023)



Figure 3.33. Overall north elevation. (STRATA 2023)

North Elevation: Wood siding on the north elevation is in very poor condition, with significant areas of water damage along the entire length of the west wall, especially near grade (Figure 3.33). Grade is in contact with the bottom of the siding and the sliding door, especially near the west side of the wall. Missing sections of siding have resulted in holes through the wall. Where siding is missing, the interior framing is severely deteriorated (Figure 3.34). The wood siding is scribed around the stone & concrete piers at several points along the façade. Contemporary wire mesh has been installed along the bottom of the north side of the wall to prevent animals from entering the barn. Additional loose field stones have been placed to also prevent animals from entering.

The west bay is covered by a nearly 13-foot-wide sliding barn door constructed with the same v-joint siding used throughout the exterior. The metal track is installed just below the exposed rafter tails (Figure 3.35). Horizontal wood boards span the space between the underside of the roof and the west bay door opening to support the track, with large gaps in the siding exposing the interior. The sliding door is deteriorated and has slid out of the metal track. The age of the metal track is unknown, but it may be able to be dated based on hardware catalogs from the early to mid-20th century.

Wood trim (blocking) is installed between many of the exposed rafters at the top of the wall (underside) of the roof eave. A contemporary fascia board has been installed across some of the exposed roof rafters, but it is not painted and is warped and deteriorated. A section of this board has fallen and is only partially attached. The fascia board appears to have been installed to support a gutter, which is no longer present (Figure 3.36). Several sheet metal straps may be evidence of this missing gutter.

The existing window opening 104 has no formal framing or trim. Contemporary wire mesh is installed on the interior face of the opening. This is likely a newer opening cut into the siding, as the paint on the siding goes to the edge of the opening, indicating there has never been trim installed in this location. The window opening is not seen in the 1922 photograph of the barn.



Figures 3.34. (Left). Severe deterioration of interior wood timber framing where siding is missing. (Right). Wood siding was scribed around the concrete pier. Note that the wire mesh was installed behind the siding. (STRATA 2023)



Figure 3.35. Detail at the west bay sliding barn door and trim above. (STRATA 2023)



Figure 3.36. Detail at north elevation eave with contemporary fascia board and missing gutter. (STRATA 2023)

Roofing

The standing seam metal roof is in fair to poor condition; however, there are several areas of significant failure and patches (Figures 3.37 – 3.42). The roof is a standing seam metal roof installed over 1x4 purlins without underlayment. The purlin type and size are consistent throughout the entire structure (over the original ca. 1831 section and ca. 1868 addition), with only some replacement areas noted, providing evidence that the purlins were likely installed as part of the 1868 construction or later. In addition to providing a nailing surface for the metal roof panels, the purlins provide some lateral stability to the pole rafters in the original structure and the roof rafters in the addition.

The metal roof on the barn first appears in photographs in 1922 (Figure 3.26); however, the date of its installation is unknown. The standing seam roof is likely tin-coated iron and is comprised of smaller tin-coated iron sheets joined end to end to create long panels and joined on the sides with the standing seam. The roof panels extend over the edge of the roof to create a drip; however, the edges are not treated to provide an effective drip edge with a bend to repel the water. The standing seams end at the roof edge. The panels appear to be joined with a single lock seam, which means one panel is bent over an upturn of the adjacent metal. These seams are deteriorated, but they appear to be soldered along the side of the seam. The standing seam roofing, flashings, and vertical wall panels appear to be coated with an iron oxide coating.

The existing roof has some sections that appear to be functioning well. Other areas have deteriorated with large areas of rust or holes and have been covered with various types of metal roof patches. Widespread deterioration is seen throughout the roof, especially along the eaves, where the rusted metal is completely worn away. The roofing has failed along the south side of the barn where the tree fell and went through the roof. Flashing at the northwest corner roof and

gable intersection has also failed. Both sections allow a significant amount of water into the structure. Due to the widespread metal deterioration, the roof is likely not in a condition to be retained and restored.



Figure 3.37. Detail of the tin-coated iron standing seam roofing. (STRATA 2023)



Figure 3.38. Standing seam metal roof along the north side of the roof. (STRATA 2023)



Figure 3.39. Standing seam metal roof along the west side of the roof. (STRATA 2023)



Figure 3.40. Standing seam metal roof along the south side of the roof. (STRATA 2023)



Figure 3.41. Roof deterioration along the south side of the roof. (STRATA 2023)



Figure 3.42. Standing seam metal roof visible from the interior. Note that the long seams show the joints between the panels. (STRATA 2023)

Electrical Existing Conditions

Evidence of a previous electrical service in the barn can be found. An abandoned electrical panel, along with a switch and outlet, remains installed inside the northeast corner of the barn. A porcelain socket and outlet are visible in the center bay. A porcelain socket, outlet, and switch are located near the sliding barn door in the west bay. Additional porcelain sockets are in the west and south bays. Some wiring and older knob and tube porcelain insulators remain throughout the interior and exterior. The electrical service was likely overhead but is no longer extant.



Figure 3.43. Electrical panel, switch, and outlet (left).
The socket, outlet, and switches are near the sliding door (right). (STRATA 2023)

Accessibility Existing Conditions

The existing barn was constructed to house livestock and support farming operations. The building has never been open to the public, and there are no accessible-compliant routes on site or within the building. The floor in the central section is raised approximately 16 inches above grade at the main east entrance and is accessed only by wood steps with no railing. The floors in the south, west, and north bays are a combination of dirt and concrete flooring. To access the center floor from the bays, one must step through openings in the north and south waste walls, which requires a step up onto the sill beam to the center floor.



Interior of original structure, from south addition loft looking north. (STRATA 2023)

4 TREATMENT RECOMMENDATIONS

Chapter 4 - Treatment Recommendations

4.1 Introduction

Previous chapters outlined the building chronology, significance, and existing conditions of the historic Carson-Steel Barn. Considering this information, this chapter documents the process of determining a preferred long-term treatment approach for the historic barn. The preferred treatment, considered through the Treatment Workshop, focuses on the barn's demolition in a sensitive manner. This treatment would potentially allow for salvage or reuse of portions of the historic barn structural elements while protecting the significant archeological resources of the National Historic Landmark / UNESCO World Heritage site at Hopewell Culture National Historical Park.

This prehistoric Hopewell Mounds Group ceremonial complex included the largest single earthen-walled enclosure constructed by the Hopewell, which contained 29 mounds and encompassed over 130 acres. The largest burial mound the Hopewell built is within the enclosure. Astounding quantities of finely crafted art made of exotic materials were buried here as part of elaborate mortuary ceremonies. The barn and site are unique in that the barn itself is historic, with the original section dating to the 1830s; however, the barn was constructed within the Great Enclosure, adjacent to or potentially overlapping the south embankment. The soil surrounding and below the barn may contain significant archeological resources, as this section of the property was not plowed or farmed.

The barn has previously been considered an intrusion into the significant cultural landscape, potentially affecting the underlying archeological resources within Great Enclosure. In recent years, the Park's tribal partners have been increasingly open to presenting the full continuum of history. Resources like the Carson-Steel Barn may offer an interpretive opportunity to explain why tribes are no longer present in the area and their displacement to Oklahoma. Timing is critical to implement a treatment, as the barn is in a state of partial collapse, with the potential for a more catastrophic failure. Recent investigations revealed much more extensive deterioration than originally anticipated. About half of the heavy timber frame is rotted and failing, and the siding and roofing have reached the end of their life cycle. It would be prohibitively expensive to return it to service, and even if the barn were stabilized, the building may not have much historic fabric remaining. Due to the age of the barn, its current condition, the absence of a viable future long-term use, and significant rehabilitation costs, it was decided that removal or demolition of the barn is the preferred treatment option.

The chapter is divided into three sections.

- **4.2 Treatment Workshop Summary -** This summary outlines the various treatment approaches that were explored and the decisions made during the Treatment Workshop held in June 2024, including establishing specific goals for the preferred treatment of the property and the options presented.

- **4.3 Execution of Preferred Treatment -** The section addresses the recommendations for the preferred treatment for demolition to assist in guiding the solicitation and compliance process.
- **4.4 - Compliance and Consultation –** This section discusses meetings with the Region and Ohio State Historic Preservation Office to discuss Section 106 compliance and consultation.
- **4.5 - Demolition Preparation, Scope of Work, and Draft PMIS Statement –** This section outlines recommendations for preparation for demolition (additional testing and compliance), identifies the demolition scope of work, and provides a draft PMIS Statement for park use.
- **4.6 Documentation of Rehabilitation Work Option *(Not Preferred)* –** This section documents the requirements for the long-term *Rehabilitation* option's scope of work and is provided to document the complex strategy and process involved in preserving the barn structure.

4.2 Treatment Workshop Summary
Preferred Treatment: Demolition and Salvage

The project team held a one-day hybrid *(in-person and online)* Treatment Workshop at the park headquarters in June 2024. The workshop's purpose was to review the relevant historical information, historical significance, current conditions, discuss issues and potential historic treatment options, and develop a preferred treatment for the barn. Along with the AE Team (STRATA and Silman), the workshop was attended by the HOCU park Superintendent, two park Archeologists, the Director of Interpretation, the Maintenance Worker Supervisor, and the Facility Manager, as well as the Regional Historian, the Regional Program Manager of Design and Construction, and the Project Manager / Historical Architect. The Survey and National Register Manager from the Ohio State Historic Preservation Office also attended the morning session. The workshop was very productive and provided a forum to share information and establish priorities for the project.

The Treatment Workshop Meeting Notes and Presentation are included in Appendix D of this report for reference and to provide more in-depth documentation of the discussions.

Workshop Introduction
John Rosemurgy, Project Manager / Historical Architect with NPS Region, provided an introduction to the project and discussed the goals for the workshop. The project came about because the park requested assistance to determine the historical and cultural significance of the historic barn, identify potential uses, and determine what repairs would be required. This HSR is a result of responding to the park for technical assistance to help manage this resource that is shrouded in many questions.

Historic Structure Report Goals
1. Document the Historical Background and Context
2. Record the Chronology of Development and Use
3. Identify Character-Defining Features
4. Provide Documentation and Physical Description
5. Provide a Conditions Assessment
6. Develop a Treatment Plan, including alternatives
7. Determination of Eligibility and NR Nomination

History, Significance, and DOE
Debbie Sheals, the HSR architectural historian, presented the archival research and historic timeline of the park and barn.
- The barn was renamed the 'Carson-Steel Barn' during the research and investigation phase of the project to reflect the families involved in its construction.
- Period of Significance
    - Research, investigation, and dendrochronological testing found the previously estimated construction date of ca. 1800 was incorrect.

    - The barn was built in two phases. The period of significance begins **ca. 1831**, with the construction of the first section, and ends **ca. 1868** when the addition was complete. The barn has seen no significant additions or alterations since the 1860s.
- The workshop presentation discussed each historical episode, based on major ownership and site management, along with chronological period plans for each episode.
- This information is essential when identifying the period of significance (1894-1969) and significant features of the barn.
- A Determination of Eligibility (DOE) has been submitted and reviewed by the Ohio SHPO for potential listing in the National Register of Historic Places. The barn appears to qualify under Criterion C, for its design and construction as a combination of Scribe Rule and Square Rule, Timber Frame Barn with local significance. However, more data would be needed on comparable barn and timber frame properties.

Character-Defining Features

- Heavy timber frame of original ca. 1831 barn and ca. 1868 addition.
- Waist/waste walls and wood flooring
- Roofline and general form of the building. The date of roofing is unknown, but it may date to 1868 or later.
- Siding was likely added later, outside of the period of significance.

Work to Date and Conditions Assessment

STRATA Architects Inc. (historical architect and contract manager) and Silman (structural engineer) presented the work to date and the assessment of the existing conditions of the barn:

- Site location and orientation.
- Matterport Survey and 3D Scanning were done on the barn by RC Monkeys.
- Dendrochronology of the framing and rafter poles was completed last October. Timbers were mostly from the late 1820s and early 1830s in the main barn and from the 1860s for the U-shaped addition. These helped to establish construction dates for the two portions of the barn.
- The timber framing workshop provided insight to the park and AE Team on the timber framing techniques used in constructing the two sections of the barn. They brought historic tools along for the demonstration.

Condition Summary

- The Carson-Steel Barn varies in its overall condition. Some historic barn framing is in good structural condition, while other sections have completely failed. Without intervention soon, the structure will continue to fail and will not be repairable.
- Aside from the exterior siding and roofing, the building is primarily composed of structural elements.
- Structural Failure is due to a compound of issues:
    - Previous storm damage (twice) with sections of missing roofing
    - Leaking roof/flashings allowing water to infiltrate
    - Pests below the finished first floor piling dirt along the wood framing
    - Differential settlement of the stone piers has shifted framing, dislodging joints

  - Pests that have infested certain sections of the wood structure (powder post beetles, carpenter bees, termites, and rodents) do not seem to be currently active.
  - Deterioration of siding exposing structural elements to weather
  - Settlement of interior concrete floor (south addition bay)
- Structural Failure includes:
  - Deteriorated sill beams (south and west)
  - Buckled posts (west)
  - Deteriorated posts (west and south)
  - Missing post (west addition)
  - Deteriorated first-floor structure (center)
  - Deteriorated rafter plates
  - Deteriorated rafter ends
  - Deteriorated and missing rafters from storm damage
  - Deteriorated loft framing and supports

Factors for Decision-Making

1. National Register Eligibility
2. UNESCO World Heritage Site Designation
3. Previous CLR Treatment Recommendations
4. Preserve Original Material
5. Preserve Context
6. Potential Compatible Uses
7. Repair / Rehab Costs and Long-Term Maintenance
8. Staffing Requirements
9. Secretary of the Interior's Standards for the Treatment of Historic Properties
10. Factors Added During Workshop
11. Visitor and Staff Safety and NPS Liability Concerns
12. Hazardous Materials Remediation for Lead Paint
    - Archeological Concerns with potential lead in the soil
13. Archeological Concerns with Potential Structure Collapse, Removal, Dismantling, or Rehabilitation (All will require some ground disturbance)
14. Public Opinion

Hopewell Culture National Historical Park Mission Statement

> *The park **educates the public** about the daily lives, contributions, perceived values, and interactions of the Hopewell peoples with other peoples and the environment around them.*
>
> *The significant sites in the park and related **sites are protected and preserved** by various means, and the local community feels a sense of stewardship for these and other sites.*
>
> *The visitor leaves the park and related sites with a greater knowledge about the Hopewell culture, an **understanding of the relationships between the sites, an admiration of the Hopewell accomplishments**, and a cognizance of the need to preserve them.*

Previous Treatment Recommendations for the Hopewell Mounds Group Site

The 2016 Cultural Landscape Report (CLR) presented two treatment alternatives:

- CLR Treatment Alternative 1 *(Not Preferred)*:
    - Non-contributing features, including the Carson-Steel Barn, can be used to interpret the early archaeological investigation of the earthworks.
- CLR Preferred Treatment:
    - At Hopewell Mound Group, *rehabilitation* emphasizes revealing the spatial qualities of the Great Enclosure. Existing large-scale intrusions, including utilities, structures, and other non-contributing features that do not reflect the Hopewellian earthwork complex, will be **removed and/or relocated**.
    - Long-term treatment recommendations are to remove all buildings and structures from the earthwork complex, in order to protect the setting of the archeological landscape.
    - The park will work with property owners to develop a long-term plan to remove buildings that impact the earthwork.

Choosing an Appropriate Treatment for the Historic Carson-Steel Barn

- The Secretary of the Interior's Standards for the Treatment of Historic Properties are guidelines intended to promote responsible preservation practices that help protect the nation's irreplaceable cultural resources.
- Choosing the most appropriate treatment for a building requires careful decision-making about a building's historical significance and several other considerations, including the level of historical significance, physical condition, proposed use, life safety code, and other regulations.
- Discussion included the fact that the Carson-Steel Barn has a local or potentially state level of historical significance and is in overall poor condition. Any potential reuse of the barn may negatively impact the overall historic integrity of the barn and sensitive archeological site.
    - Therefore, if any work to the barn for stabilization of future long-term use would utilize *Rehabilitation* as the most appropriate historic treatment approach; character-defining features would be preserved while allowing for maintenance, repairs, and much-needed treatment of the barn structure for long-term use. This approach will allow for the interpretation and use of the barn in its historic setting while providing appropriate and compatible long-term use.
    - Besides rehabilitating the structure, the project must preserve the significant cultural landscape and protect the archeological resources.

Rehabilitation General Discussion

Before discussing the rehabilitation-focused long-term options, the group discussed what it means to rehabilitate the barn.

1. The heavy timber framing IS THE character-defining feature of this barn. The rehabilitation effort should consider the preservation and retaining of this historic fabric as the focus of the treatment.
2. Once the rehabilitation is designed, are there enough original materials to retain the structure's historic integrity?
3. Stabilization is required to make the barn safe to work in. Rehabilitation means getting it to a point where stabilization is not visible and able to stand on its own.
4. Current approach – cut out damaged heavy timber and replace it with new.

5. Former preservation approach for heavy timber framing included a lot of epoxies. Current practices are moving away from that. Replace it in kind with new heavy timbers. Can conceal screws if needed. Avoid epoxy. Celebrate craft.
6. The best way and most efficient way to fix the barn is to disassemble the framing. This is typical for barn rehabilitation and repair contractors and salvagers today. Because the barn was assembled with mortise and tenon joints, the joints come apart and can be reassembled.
7. More study would need to be done, but approximately 40% of 1831 structure would need to be replaced, and 60-70% of the 1867 structure would need to be replaced.
8. The wood posts and sill beams are currently resting dry laid stone, although many sections are now resting on or within grade.
9. Repairs would require minor excavations for footing supports.
    a. The glacial fill in this area below the structure is essentially unconsolidated sand and gravel for about a meter down. It has no structural capacity.
    b. The structure is sitting on or very near the enclosure wall itself. Any kind of ground disturbance would be of great archaeological concern. This is the primary resource. (Bret)
    c. Archeological costs will be high for this project.
10. It is unclear if the barn would remain eligible for National Register listing if the barn is completely disassembled and reassembled with partially new components, new siding, and a new metal roof. This would require further discussion with the SHPO.

Carson-Steel Barn and Site Treatment Options

Several treatment options were presented, and another was identified during the workshop.

1. NO ACTION

Discussion around the 'No Action' Option included:

- The barn would fall down. This presents a significant life-safety issue to the public and park staff.
- A dilapidated or fallen-down barn may affect neighboring property values.
- A fully or partially collapsed barn may damage the historic stone piers, resulting in archeological concerns.
- No Action alternative does not represent responsible resource management.
- Other organizations may be interested in helping maintain the barn. However, this may only be done through technical advice and not monetary or property management.
- If the barn collapses, this may require additional archeological intervention and will require some type of action to complete its demolition and removal. This would be an emergency or a more urgent matter than if it was planned.

2. ALTERNATIVE #1 – Stabilization and Basic Maintenance (Mothballing)

Stabilization and basic maintenance would be defined as stabilizing framing and keeping weather out. Essentially stabilize and halt further deterioration.

Discussion included:

- Current structure is unsafe.
- Physical work is beyond park in-house capabilities.
- This would require further long-term maintenance and resources by the park.
- This treatment would imply that there would be a long-term, more significant treatment or effort. This would require additional planning and funds.
- The last stabilization effort was unsuccessful, as the park could not find a contractor willing to take the risk. What is the available pool of qualified contractors to work on this historic timber-framed structure?
- Structure will continue to weather and deteriorate.
- May require a fence. 6' is not high enough. May require a 10' fence. This is unsightly.

Pros and Cons

1. Pros
   a. Stabilization keeps options open for future treatment and potential rehabilitation or dismantling.
2. Cons
   a. Cannot fix the grading issues, timber touching grade.
   b. Stabilization work will require some digging to support the temporary structure. This will trigger archeological investigation.
      - Safety & Compliance concerns - Limits who will bid for the work and increases cost significantly.

Further Considerations

3. Section 106 Compliance – Determine a compliance process with park and Region.
4. The ground is so soft – archaeological concerns.

3. ALTERNATIVE #2 – Rehabilitation of Existing Barn for Park Use

The only advantage of a rehab of this barn for park use is for storage.

- Barn would be fully rehabilitated to be safe and able to be occupied. Work would include repairing the structure, new siding, new roof, and constructing footings where needed. Probably will want electricity and security systems. Depending on use, may or may not require a sprinkler. There is currently no water service to the barn.
- Current 2024 codes for wind loads may require a waiver. It is unlikely the structure can meet current standards.
- Will require grading, excavations, and trenching.
- Will require Section 106 review.

Discussions about rehabilitation included:

1. The interior floor is raised about 16-17" making it hard to use the center portion of the barn for equipment.
2. Door to get inside is a normal-sized man door.
3. Historic built-in wood mangers have been altered/cut to provide access between the 1831 and 1868 addition levels. The barn was not built to be accessible. Stairs and/or a ramp would be required to be built to access both levels.
4. 7’-9" x 7’-0" pairs of doors, not sized like modern commercial barns – too small to get modern equipment through.
5. The park could store a mower in the barn, but there is no security and no easy way to provide security.
6. Would work best with a new concrete interior floor everywhere, including in the center.
7. Storing gas equipment and cannisters would require proper fire-proof storage.

Storage Use - Pros & Cons

1. Pros
    a. Retaining a cultural resource (non-contributing) yet a resource still.
    b. Currently no storage at Hopewell Mounds Group, and space is limited within the park for new storage opportunities. Could store mowers.
2. Cons
    a. We don't want to put storage inside the earthworks. This seems disrespectful.
    b. Why spend millions of dollars to have a new storage facility? Could be built new for less in other location. (If storage is needed, may be best near the visitor services area to the east).
    c. Storage is not a compatible reuse option due to the work involved bringing it up to modern storage standards for equipment and supplies.
    d. Long term maintenance and resources required.
    e. Impact to viewshed in World Heritage Site Cultural Landscape. Day-to-day use as a maintenance facility diminishes the visitor impact and interpretation. Maintenance facilities require outdoor storage within the viewshed of the primary historic resource.
    f. If we put all the money into it, due to its historic nature, do we even want to store equipment and pallets in it? It was never built for modern storage needs. If using it for storage, is this the reason for the park to keep the building?
    g. Balancing money and need, which is a heavy monetary investment for not enough need. Can we justify putting all this money into a cultural landscape resource just to use it for storage?
    h. Barns present a huge rodent problem. Without proper rodent protection, they will eat wiring out of equipment.
    i. Significant compliance due to archeologically sensitive area.
    j. Project may be cost prohibitive.

4. ALTERNATIVE #3 – Rehabilitation of Existing Barn for Visitor Use

An option for rehabilitation would be to utilize the barn for visitor interpretive use. Barn would be fully rehabilitated to be safe and able to be occupied.

- Fully repairing the structure, new siding, new roof, and constructing footings where needed. Taking the barn back to a point where a visitor can walk through the barn and see the repairs. The new use will need electrical and security.
- Barn rehabilitation, depending on use, may or may not require a sprinkler. There is currently no water service to the barn.
- Current 2024 codes for wind loads may require a waiver. It is unlikely the structure can meet current standards.
- Will require grading, excavations, and trenching.
- Will require Section 106 review.
- This is a high-touch approach and universal accessibility will be required on site and in the building. The site is far from current accessible parking.
- Signage will be required.
- Only need to sprinkle if artifacts are stored inside or if the building is considered an artifact. Artifacts are probably off the table as security will be an issue still. Need to protect images and reproductions, whatever interpretative media that is put in there.
- Programming would need to be defined. How often is it used? How often is it staffed?
- Why can't it be an open-air barn? Plenty of examples of this in the Rockies. Within a national park that does close, but the barns themselves never closed. This location on a county road would lend itself to unfortunate activities very quickly.
- Still hard to keep pests out; that's a consistent part of the barn
- Consider the impact of increased visitors to the neighbor.
- Increased pedestrian and potential vehicular traffic would be a concern.
    - Consider partnership with the County Parks System. They maintain the adjacent trail.
- Barn remaining would require interpretive opportunities to be developed. Themes may include:
    - Indian Removal Act: Rehabilitation of the barn adds this structure to the story of the development of the land. This may be an opportunity. However, its construction is outside of the 'removal' story. Tribes were still living in Ohio, but that is not a focus of the current park's interpretation.
    - Hopewell Family, where the Hopewell name came from
    - Early archaeological investigations
    - Barn construction technology
    - Transition of land to agricultural use

Visitor Interpretive Use - Pros & Cons

1. Pros
    a. Retaining a cultural resource (non-contributing) yet a resource still. This meets the park's Mission Statement to protect, manage, and preserve natural and cultural resources for the visitor experience.
    b. Could provide some shelter for those on the nearby trail.

c. Quite literally, some of these timbers were cut during the period of the Indian Removal Act. Expansion of the agricultural use of the land is a big part of the story. Not sure it reaches the necessary mark, but it makes this site unique from the others.

2. Cons
    a. Potential impact to neighboring property.
    b. The park has two other sites that demonstrate this narrative already. What is the advantage of this site being additional, at the price tag it will be to rehabilitate it?
    c. Would require additional staffing if used outside of special events or tours.
    d. Long term maintenance (costs and labor).
    e. Would require a significant upgrade to meet current universal accessibility standards. The center floor is higher than the surrounding shed additions. This will require a ramp. The interior dirt floor is not accessible and would need to be upgraded to an accessible-compliant material. Changing these items would alter the original character of the barn.
    f. Will require accessible parking and signage to be installed, which has a high visual impact within the enclosure and within the viewshed of the primary resource.
    g. Interpretation offers limited use of the structure for the $ involved.
    h. Will require grading, excavations, and trenching.
    i. Significant compliance due to archeologically sensitive area.
    j. Barn does not have any visual connection to primary resource (mounds) from inside the building. However, you cannot see the historic components of the barn without being inside.
    k. No way to do climate control, so limited artifacts and/or media can be displayed.
    l. Security is an issue on a public trail that is open 24-7.
    m. Barns present a huge rodent problem. Without proper rodent protection, they will eat wiring out of electrical and security equipment.
    n. If only open 10-15 days a year, does this justify the cost?
    o. Balancing money and need, which is a heavy monetary investment for not enough need.

5. ALTERNATIVE #4 – Historic Use / Leasing

This alternative focuses on the NPS utilizing a leasing program with an outside vendor or leaseholder for a long-term lease on the barn structure. These leases can be decades long and require the leaseholder to maintain the structure.

1. Most leases would be looking for a return on their investment, meaning they need this property to be income-producing. Income-producing uses of this property are not compatible with a location in the midst of a sacred NHL / World Heritage site.
2. Due to concerns about the ability to limit to only compatible uses, there was not much discussion on this alternative.

6. ALTERNATIVE #5 – Treatment Alternative #5 – Sell / Surplus Barn Structure

The NPS would sell/surplus the barn structure to an outside bidder. This would be similar to selling a piece of equipment. The land would not be sold with the barn. The intent would be to find a bidder interested in salvaging the historic timbers for reconstruction in a new location, used for the construction of a new barn, or as salvaged timbers for repairs to another historic barn. However, the use cannot be dictated in the government's Request for Proposals (RFP).

Discussion Included:

1. Friends of the Ohio Barns have suggested salvaging the structure.
    - 1830s structure does have some value for the timbers, joists, floorboards, and pole rafters that have not deteriorated. The 1867 addition is a combination of 1860s timbers and surplus parts. The timbers, joists, floorboards in the lofts, and rafters are old-growth wood and would have salvage value.
2. How does this affect the story that the park tells here at this site?
    - Adding this to the potential story was one of the initial thoughts. Over the past year, this has dwindled a bit. It would be a sub-sub-sub-theme.
    - Initially there was the thought that this barn dated to the treaty of Greenville. No longer part of it. But it does speak to the history of removal. It is a part of the second farm, not the initial, so it doesn't necessarily speak to the direct plowing over of the mounds.
3. 2016 CLR suggested removing the barn. The SHPO did not object to that recommendation.
4. There is liability in salvaging or deconstructing/disassembling the barn structure.
    a. NPS Reuse in Different Park or Location:
        - Disassembly by NPS - This exposes the NPS staff to safety liability in salvaging or deconstructing/ disassembling the barn structure. This is not a viable option.
        - Disassembly by Contractor for NPS Use: If salvaged for NPS use, can the work be done by a contractor, and the salvaged material to be reused delivered to the NPS?
    b. Outside Bidder/Contractor Takes All:
        - Assigning the responsibility of removal of the barn structure by an outside resource is the best outcome.
        - However, it may be challenging to assign methods and means of demolition. Some demolition contractors may use large equipment or wrecking equipment. Structural collapses may result in archeological damage to the surrounding area, including the piers. The successful bidder may be inexperienced in archaeological sites.
        - Due to the archaeological sensitivity, contractor must take only the above-ground wood framing and leave the piers and the grade, and the park will still be responsible for dismantling the items in or below grade.
5. Only a portion of the overall barn structure may be salvageable for reconstruction or repairs to other structures.
6. The disposition process would likely start by offering the barn to other parks and exploring other options before listing it for public sale.

   a. It is unlikely that other parks can afford the expense of deconstruction, salvaging, and shipping materials.
   b. Due to the distance from other parks, they may not see a benefit to using resources that would require travel.
   c. Cuyahoga is removing around 300 structures. Park crews are salvaging what they can use. This differs from this project in that this structure is unsafe to work around.
7. An RFP would likely be issued if offered to the public. This is Real Property – Maybe through auction or bids.
   a. No matter what a Contractor buys it for, they must have the means to do the work. Could buy for a small amount, but the work/labor for dismantling, selective demolition, and hauling will be costly.
   b. How do you pick a successful applicant?
      - Qualifications and Experience
      - Potential Reuse (likely not a factor). The government cannot put restrictions on the potential reuse of the barn – once it's gone, it's gone. You can make them write an RFP, but once it's sold, the NPS has no authority to tell private entities what to do. If the NPS is not using it somewhere, you lose all rights to dictate future manner of use.
8. Archeological sensitivity will be required to dismantle the structure. The stone piers are buried partially in grade and would require excavation. There is also sensitivity to removal of the existing concrete piers and the slab.
9. If the structure is salvaged, what remains? Do you leave the piers/foundations in place for interpretation? What interpretive themes might that represent?
   a. Foundation remnants can relate to interpretive themes.
10. Potential salvage and reconstruction of timbers as a new structure, not necessarily as a replica. This still provides preservation of the timbers.
11. What is the park's responsibility to address archeological resources at the site before, during, and after dismantling?
   a. The park may need to do some further archaeological work before the structure can even be dismantled. Some limited archaeology will be required no matter what we do going forward. The park has done some test pits around that area. The report is not finalized. Interior test pits cannot be completed with the structural risks there today.

7. ALTERNATIVE #6 – Demolish the Barn

This treatment option explores contracting for the barn's demolition by a Contractor.

1. Who is responsible for demolishing the barn?
   a. Contractor takes all liability for the barn. Take everything but the piers and concrete.
   b. The Government can outline a Scope of Work for the demolition and may exercise more control over the demolition methods and means than in Alternate #5 above.
   c. The Contractor can choose the specific methods and means for the barn demolition as long as they meet the intent of the Scope of Work.
   d. The Contractor may literally demolish the barn and take it to a landfill. They may salvage it piece by piece and sell it. They may salvage it for their own

reuse. The NPS cannot dictate what they do with the structure once it's demolished, except that it must be disposed of in a licensed landfill. The contract will have a 'salvage clause.'

e. The Contractor will address hazardous materials and safety as part of the demolition, including addressing lead paint.

2. Can the Park demolish the Barn?
    a. Demolition is an option when it is justified. In this case, demolition reduces the footprint and operational costs, limits vulnerability, and increases visitor and staff safety.
3. Alternate #6 provides essentially the same result to the park of the barn removal as Alternate #5, but it represents a different process.
    a. Prior Alternate #5 is a sale, and this alternate is a paid alternate to demolish the barn. This process is developed when there is a determination that the structure no longer has value.
    b. This may be a more practical option.
    c. If the barn is demolished, the value of interpretation does not necessarily go away. The value of interpretation is not necessarily in the wood. It can be in the foundation.
4. Maybe this decision is part of a process. Start with Alternate # 5 and see if you have any takers. And then move forward with demolition.
    a. Any piece of value has to be offered to parks before the demo can go forward in any shape or form – see discussion in Alternate #5 above. However, based on conversations with other parks that might use this timber, shipping costs to other parks alone would not make it worth salvaging for other park use.
5. Salvaging Parts for the Park for Interpretation:
    a. The park could outline a few pieces to be salvaged for the park to use for interpretation.
    b. The NPS can specify partial demolition - where certain items are designated as being carefully removed/salvaged, packaged, and relocated/delivered elsewhere. The Contractor is responsible for removing them in a way that they would still be usable.
    c. Salvaging specific items may add a level of complexity that will increase costs and may decrease the number of contractors in the pool. Contractors may see the value in the salvage and be more interested if all of the salvage is theirs at the end of the project. Turning over the most intact pieces to the NPS for interpretation may decrease their interest.
6. Will archaeological mitigation balance out costs? If you just come in to knock it down, it will likely need more archaeological mitigation, whereas more selective demolition will not.

8. ALTERNATIVE #7 – Dismantling and Storing for Future Use Without Stabilization

The park introduced this new option during the workshop. This option would dismantle and store the barn for future use without stabilizing the structure. Stabilization seems like it should be off the table because a more extensive rehabilitation project will not likely be

funded. Why not disassemble and store it somewhere else and, at a later date, have the potential to reassemble the structure in a different location?

- This option is cheaper and mitigates the larger risk of the structure falling during the course of work.
- Dismantling the structure to restore the components off-site is a part of long-term rehabilitation regardless - why not skip over stabilization? This option allows for possible rebuilding later, without a deadline put on by the temporary stabilization in place.
- NPS would have to lease property to store the structure inside. They do not have funding to pay for storage.
- Then the question becomes, what conditions does the facility need to have to store the pieces?
- What portion of the barn would be salvaged? Only the 1831 portion. There are some nice oak timbers, joists, rafters, and floorboards in the 1867 portion.

Pros and Cons of Dismantling and Storing

1. Pro - Not paying to stabilize it.
2. Cons
    a. Long-term storage may become an issue with no immediate plan.
    b. Upfront cost for selective demolition and delivery to storage
    c. Storage costs

Further Considerations

Items discussed as part of the workshop to consider as part of future project for rehabilitation or demolition may include:

1. Testing the dripline around the barn to determine the level of lead paint in the soil so that mitigation can be addressed. This may have a significant impact on the archeological resources.
2. Bats have not yet been observed in the barn. However, this is something that should be monitored through a bat survey.
3. Partnerships – Does the park know of any partners who could set up a partnership to dismantle and use the property?
    a. This process would not be 'easy' but may be more manageable from a political aspect. While some of the not-for-profit groups may not have the resources to do the work, they might have people in their groups with the resources.
    b. This may be a liability issue and a question of how to give this government property away.
4. While the CLR from 2016 recommends the preferred treatment to demolish the barn, the NPS will need to enter a full review process to include the tribes.
5. Community engagement:
    a. At a small park, all staff are front-line. Community engagement happens by everyone at some level.

b. The park has a friends group, but they are not typically involved with public engagement.
c. Public opinion in the instance of a potential demolition may be drastic. The community takes pride in their history. The NPS should be prepared to present costs associated with the rehabilitation and decision for demolition. Small, but vocal groups may be heard. They hold the NPS to a high standard.
d. Provide opportunities for interpretation.

Preferred Treatment Workshop Selection

Upon completion of the Treatment Workshop, no clear short of long-term treatments were selected. The park and region requested additional time for considerations of Alternate #5 - Sell the Barn or #6 - Demolish the Barn.

4.3 – Execution of Preferred Treatment: Demolition and Salvage

Upon completing the Treatment Workshop in June 2024, the park and Region requested additional time to consider the options; the park and Region were leaning towards either Alternate #5 - Sell the Barn or #6 - Demolish the Barn.

After further consideration of the options, the group reconvened in August 2024 to discuss the ***preferred treatment - Alternative #6 - Demolish the Barn***. Through scholarship and investigation of the barn's history, assessment of the existing conditions, and development of the treatment rehabilitation options, the park and Region concluded the Treatment Workshop was a testament to the process and that they had more than adequate information to determine that demolition was the best option. This meeting included discussions of how the barn would be demolished and what would happen to the barn materials. It was acknowledged that disposal is not a favored outcome. The preference is to incorporate salvage into the demolition contract so that components in sound condition may be reused.

The next steps will include creating a new PMIS (Project Management Information System) statement for barn demolition. Depending on available funding, project formulation could result in a contract with the Denver Service Center to be bid through an existing MATOC (Multiple Award Task Order Contract). Due to the preferred demolition treatment, the HSR Team will not prepare a final National Register Nomination for the barn. The historical research and Determination of Eligibility included in the HSR will serve as adequate documentation.

4.4 - Compliance and Consultation

The park, the HSR Team, and the Regional NPS office met with the Ohio State Historic Preservation to discuss the preferred treatment for the barn demolition in October 2024. The Ohio SHPO national register team reviewed the eligibility determination and attended the Treatment Workshop. The HSR Team reviewed the condition, integrity, and determination of eligibility of the historic barn with the SHPO and discussed the particulars and sensitivity of the barn constructed within the earthworks. They also presented the extensive documentation that had occurred to date as part of the production of the Historic Structure Report, including the extensive research, the Matterport tour, building 3D laser scanning and resulting Revit model, production of as-built drawings (plans, elevations, and building sections), as well as photography, the Treatment Workshop, and the Historic Structure Report.

Region will draft the adverse effect letter and invite the Advisory Council on Historic Preservation (ACHP) to consult to begin the official consultation and Section 106 process. The State Historic Preservation Office recommended that Region use the SHPO form as a guide and include a cover letter and all information as attachments. Once the submittal is completed, the consulting party meeting will be set. Consulting parties will likely include tribal partners and other interested local, regional, or state parties with an interest in the historic barn. The goal is to outline that this project has minimal ground disturbance and that the adverse effect is limited to the barn structure only.

The NPS has its own Memorandum of Agreement (MOA) process that includes templates. The MOA will require a draft of the scope of work for the barn's demolition, which will be used to assess potential impacts on archaeology. MOA should include the Area of Potential Effect (APE) to document the area of undertaking. The APE will need to include a demolition zone, temporary access points, and staging areas. This should be identified in a diagram. A draft APE is included here in Figure 4.1. Fencing should also be addressed. No fencing should be driven into the ground, as this could affect potential archeological resources. All fencing should be pad-mounted without penetrating the earth.

The park will develop a PEPC page for the barn demolition to include the PS Cultural Resource Management review.

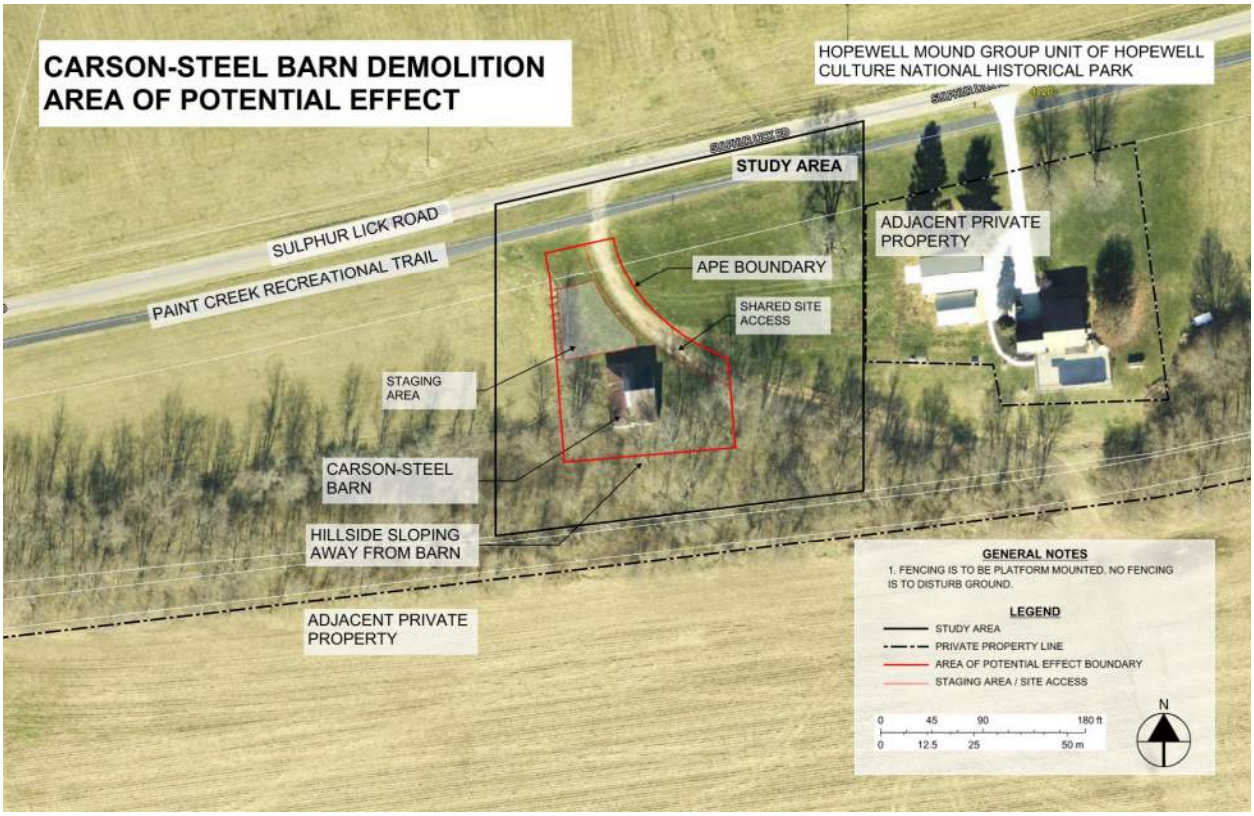


Figure 4.1. Area of Potential Effect for Barn Demolition

Mitigation Discussion

The Ohio SHPO does not encourage 'document and demolition' mitigation. They generally prefer mitigation solutions that benefit the public and/or are preservation oriented. So, while the current research and documentation for the Carson-Steel Barn and site are substantial, additional mitigation strategies or opportunities may be considered.

All previous archeological documentation related to the Carson-Steel Barn should be carefully reviewed. The more recent archeological investigation work with the test pits has not yet been fully processed, and the report is outstanding. The park cultural resource team will produce a report assessing the potential impacts of demolition, including an analysis of materials collected by contract in 2011 and a review of historical information pertinent to evaluating the location and integrity of the embankment wall in the project area. This report should identify whether additional archaeological investigations are needed and, if so, if the scope of that work is feasible for the park's capacity.

4.5 - Demolition Preparation, Scope of Work, and Draft PMIS Statement

Draft demolition scope of work, PMIS project statement, and project specifications have been developed for the Carson-Steel Barn and have been included to support this HSR.

Draft Deliverables were produced as a separate deliverable and include:

- Draft Area of Potential Effect site plan (same as shown in Figure 4.1)
- Draft Project Specifications with Appendix of existing conditions photographs
- Existing condition drawings with building components identified (same as included in Part 1 of this HSR).

In general, the demolition scope includes the work outlined below, which is included in the draft project specifications and in the Draft Demolition PMIS Project Statement.

Prior to demolition, it is recommended that the park undertake hazardous materials testing of the barn and site, specifically along the dripline of the barn, to determine if the soils surrounding the barn contain lead above the required amount for formal abatement. If lead is found in the soil, the scope of work outlined below (and the project specifications) would be revised to include the required soil abatement.

Prior to demolition, it is recommended to conduct a bird and bat survey to determine if the demolition work could adversely affect roosting birds or federally protected bats. Work should be sequenced to avoid disturbance, per the USF&W guidelines.

Demolition Scope Overview and Considerations:

1. First and foremost, work shall protect the potential archeological resources of the property.
    a. Contractor shall protect all earthen grade from damage from humans and equipment with a minimum of two layers of ¾” plywood, or similar methods, to prevent gouging or impacting soil. This will be reviewed and approved by the park prior to work.
    b. Contractors shall not drive equipment, fencing, signage, or any other accessories or equipment into grade.
    c. Contractors shall not dig, gouge, trench, or move any soil.
    d. The existing dry-laid stacked stone piers that support the ca. 1831 original barn and portions of the ca. 1867 barn structure shall be carefully protected and retained in situ with no modifications or alterations. Do not alter soil in any way in these locations.
    e. Some timber frame sill beams are in contact with or buried in grade. These sill beams shall remain in situ, undisturbed, and will be removed later by the park archeologists.
    f. Modern concrete piers and concrete slabs are not to be disturbed. These shall be protected and remain in situ, undisturbed, and will be removed later by park archeologists.

g. Any items currently impaled in grade will remain intact. Do not remove.

2. Construction Contractor shall have limited use of site for demolition operations, including staging, equipment, and personnel within the limits of disturbance. Limit use of premises to Construction Limits indicated on drawings. Do not disturb portions of the Project site beyond areas in which the Work is indicated.
3. Parking / Site Drive / Entrance:
    a. Parking may be limited to the area shown in the APE, and additional parking is available at the nearby Visitor Service Station at Hopewell Mounds Group. The address is 4731 Sulphur Lick Road, Chillicothe, OH 45601.
    b. The contractor shall protect the gravel drive and limit disturbance to potential archeological resources below and surrounding the drive.
    c. The site entrance is an easement drive shared by the NPS and the neighbor for access to their fields south of the barn site. This road should be open at all times for the neighbor's use. Do not park cars or equipment on this drive.
    d. Any required repairs must be coordinated with the Contracting Officer at the Contractor's expense.
    e. Contractor shall only utilize the existing gravel drive as the site entrance. No other temporary drives shall be added.
    f. An active, multi-use recreational trail crosses the entrance drive. The Contractor shall maintain pedestrian access at all times and provide advance warning signage and lookouts, if required, during equipment delivery or hauling.
    g. Schedule deliveries to minimize use of driveways and entrances. Contractor to be on site during all deliveries to ensure delivery vehicles stay within the designated limit of disturbance areas and do not damage the site in any way.
4. Storage / Stockpiling:
    a. Storage is limited and only to be within the APE as approved by the Contracting Officer.
    b. Stockpiling is not allowed on site.
5. Preservation of Natural Features:
    a. Prevent damage to natural surroundings. Provide temporary barriers to protect existing trees and plants and root zones. Temporary barriers must be surface-mounted and not penetrate the soil.
    b. Do not remove, injure, or destroy trees or other plants without prior approval. Consult with Contracting Officer and remove agreed-on branches that interfere with construction.
    c. Do not fasten ropes, cables, or guys to existing trees.
    d. Carefully supervise demolition operations near trees to prevent damage.
    e. A bat emergence survey will be completed by park staff before any demolition work begins. If any bats are discovered on-site during demolition, work will stop immediately and will not be resumed until cleared by the park's Superintendent or Biologist.
6. Public Safety: Contractor to limit operations to within the APE. Public access within the APE will be prohibited.

7. Utilities: There are no known existing utilities on site. It is not anticipated to need temporary utilities. If nearby utilities need to be interrupted, coordinate at least five days in advance with the Contracting Officer.
8. Refueling is not permitted on site due to the sensitive archeological nature of the site and nearby waterways.
9. No smoking is allowed within the national park.
10. No explosives may be used on site for demolition.
11. No loud music is allowed on site.
12. Contractor to deliver salvaged materials as designated in the scope of work to the park's storage facility, undamaged and well-supported, and in its existing condition prior to removal. Salvaged items to be curated as federal museum property include:
    a. Sill Beam S2-S3 (if less than 4 ft of the beam is unstable, then salvage Post S1)
    b. Widest Waist Wall board (south wall of ca .1831 structure, adjacent to Post S2, west)
    c. Timber brace bearing initials (spanning Post N1 to Girt N1-N2)
    d. 3-5 Well Preserved Wood Tenons
    e. Wrought iron U-Shaped Brace with associated hardware (connecting center beam to Post NS and S2)
    f. Samples of 2-5 historic nails (each) from the following locations:
        i. Barn siding
        ii. Floor in ca. 1831 barn
        iii. West face gable siding
        iv. Ladder mounted on east wall
        v. Waist walls
        vi. Purlins (connecting to rafters)

Draft Demolition PMIS Project Statement

This section includes anticipated work and verbiage for a new PMIS project statement.

Demolish Carson-Steel Barn at Hopewell Culture National Historical Park (HOCU)
This project will demolish the partially collapsed historic ca. 1831 Scribe Rule Carson-Steel Barn within the Hopewell Mounds Group at Hopewell Culture National Historical Park. Work consists of salvaging select materials, demolishing, and disposing of all above-grade components of the ca. 1831 and 1867 timber and wood-framed barn. Work includes partial salvaging of the following items from the barn structure for the park to use for future interpretation of the barn's Scribe Rule construction methodology:

a. Sill Beam S2-S3 (if less than 4 ft of the beam is unstable, then salvage Post S1)
b. Widest Waist Wall board (south wall of ca .1831 structure, adjacent to Post S2, west)
c. Timber brace bearing initials (spanning Post N1 to Girt N1-N2)
d. 3-5 Well Preserved Wood Tenons
e. Wrought iron U-Shaped Brace with associated hardware (connecting center beam to Post NS and S2)
f. Samples of 2-5 historic nails (each) from the following locations:
    vii. Barn siding

viii. Floor in ca. 1831 barn
ix. West face gable siding
x. Ladder mounted on east wall
xi. Waist walls
xii. Purlins (connecting to rafters)

After salvage of the noted items, the contractor may salvage / extract additional timber framing or building components for their own use prior to disposal. The remainder of the barn roofing, siding, timber framing, wood framing, mangers, wood flooring, archaic electrical system (not connected), and all other building components are to be carefully demolished and disposed of.

Protection of grade and subsurface potential archeological resources is a primary goal of this project. Building components in contact with and below grade, including sill beams, dry-stacked stone piers, concrete piers, and concrete slabs, are not to be disturbed and will be demolished later by park archeologists.

Assume all painted surfaces of the exterior cladding contain lead and dispose of all components, as required by local, state, and federal regulations.

(Include this section if lead paint above EPA limits are discovered in the soil)
Hazardous material abatement of lead in the soil at the perimeter of the structure is required, per local, state, and federal guidelines. Archeological monitoring will be required for all soil mitigation and disposal.

Justifications
The Carson-Steel Barn is in an advanced state of deterioration and is in immediate danger of collapse, presenting a hazard to park staff and potential visitors. About half of the heavy timber frame is rotted and failing, and the siding and roofing have reached the end of their life cycle. It would be prohibitively expensive to return it to service, and even if the barn were stabilized, the building may not have much historic fabric remaining. Due to the age of the barn (constructed after the period of tribal removal), its current condition, the absence of a viable future long-term use, and significant rehabilitation costs, the barn was determined through a Treatment Workshop with the park, Region, and the Ohio State Historic Preservation Office to be demolished.

The 2016 Cultural Landscape Report for Hopewell Culture National Historical Site recommended the demolition of the barn. The barn's construction is well outside the park's target period of significance for the Hopewell Mound Group (between 2,000 to 1,600 years ago) and is considered an intrusion to the UNESCO World Heritage site cultural landscape.

Demolition of the unstable barn will reduce footprint and operational and maintenance costs, limit vulnerability, and increase visitor and staff safety.

Consequence of Failure to Act

Failure to systemically demolish the Carson-Steel Barn may result in adverse effects to potential archeological resources. Collapse of the structure may penetrate archeologically sensitive grade and require additional monitored excavations for removal. The building is in imminent danger of collapse and poses a risk to the health and safety of visitors and staff. The structure is unsafe, and while 'No Trespassing' signs have been posted, the site is not secured and is located on a highly visible public trail.

4.6 - Documentation of Rehabilitation Work Treatment Option *(Not Preferred)*

Rehabilitation of the barn was not the preferred Treatment Workshop long-term treatment option due to multiple considerations. The concerns noted during the Treatment Workshop included that the extensive deterioration of the barn would result in a high percentage of replacement framing, new roofing, new siding, and potential for other invasive work to require new footings and grading. This work would include significant impacts to potential archeological resources, high costs and labor for needed archeological investigations, and it would leave very little historic integrity remaining in the historic barn structure due to replaced members. And, no long-term use or compelling interpretive themes were identified for the structure.

In preparation for the Treatment Workshop, the HSR team compiled an outline and work strategy to identify the scope of work required to stabilize and rehabilitate the barn. The *Rehabilitation* option's scope of work for the barn is provided in this section to document the complex strategy and process anticipated to be involved in preserving the barn structure, had that been the preferred long-term treatment.

The Secretary of the Interior (SOI) provides professional standards and guidance for treating historic properties listed in or eligible for the National Register of Historic Places.

Treatment recommendations for historic properties are founded upon federal standards and guidelines. In particular, guidance for the preparation of this historic structure report for the treatment of the historic barn was developed according to *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, and Restoring & Reconstructing Historic Buildings*.[173]

For buildings and landscape, the SOI defines four approaches to treatment, including Rehabilitation, Preservation, Restoration, and Reconstruction.[174] Each approach is defined, and its potential appropriateness for guiding treatment of the barn is explained.

Rehabilitation *(Recommended Approach)*
The act or process of Rehabilitation allows repairs, alterations, and additions necessary to enable a compatible use for a property, as long as the portions or features that convey the historical, cultural, or architectural values are preserved. This approach is appropriate when depiction at one particular period of time is not required; repair or replacement of deteriorated features is necessary; or alterations or additions are needed for a new use.[175]

Rehabilitation is most appropriate for this historic barn, as it provides for the preservation and protection of contributing features while allowing for changes to support potential interpretation and/or visitation and response to environmental change. Rehabilitation of the barn is

[173] https://www.nps.gov/orgs/1739/secretary-standards-treatment-historic-properties.htm, accessed December 2024.
[174] Grimmer, 2-3; and Birnbaum and Peters, 3-5.
[175] Birnbaum and Peters, 47-48.

recommended with an emphasis on the preservation of extant features that contribute to the historic significance of the building. These include the historic Scribe Rule frame structure, the Square Rule frame structure, and other building components and materials associated with the period of significance, 1831-1868, such as the dry-stacked stone footings, waist walls, mangers, and loft floorboards.

Treatment recommendations focus on the aspects of the barn that remain from the period of significance. However, the integrity of character and features are impacted by continual change throughout and subsequent to the end of the period of significance. This approach also allows for rehabilitating selected features to provide for compatible uses such as interpretation, education, environmental sustainability, and recreation. For the barn's long-term treatment, this may include providing accessibility, trails, interpretive information, and other amenities such as electricity or lighting necessary to support future use.

Preservation

Preservation includes applying measures to sustain the existing form, integrity, and materials of the contributing features of a historic property. This baseline approach focuses on stabilizing and protecting extant historic resources rather than replacing missing elements. It is appropriate when a historic property is intact and does not require extensive repair or replacement, and when continuing or new use does not require additions or alterations. Depiction at one particular period of time is not appropriate under this approach.[176]

Although Preservation is an appropriate approach for the treatment of the historic barn structure, preservation does not support the need for extensive structural stabilization and repairs, nor would it support long-term treatment to include accessibility and other amenities.

Restoration

Restoration is the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period in time. This includes the Reconstruction of missing features from the target period and removal of features from all other periods. The approach can be considered only when the property's significance during a particular period of time outweighs the loss of extant elements from other historical periods; when there is substantial physical and documentary evidence for the work; and when contemporary alterations and additions are not planned.[177]

Restoration is not the most appropriate management approach for the historic barn. Given the presence of historic features spanning several development periods, and the necessity of noncontributing features to support contemporary use, it is not desirable to remove features from one time period to highlight another. No records or documentation exists to accurately

[176] Birnbaum and Peters, 17-18.
[177] Birnbaum and Peters, 89-90.

represent the original ca. 1831 core barn structure. A rehabilitation approach also allows for selected features within the landscape to be restored or adapted, if appropriate.

Reconstruction

Reconstruction is the act or process of using new construction to depict a non-surviving site, landscape, building, structure, or object as it appeared at a specific period of time in its historic location. The approach is appropriate only when the property's significance during a particular period of time outweighs the potential loss of extant features that characterize other historical periods. In addition, there must be substantial physical and documentary evidence for the work, and the work must be clearly identified as a contemporary re-creation.[178]

Reconstruction is not the most appropriate management approach for the historic barn. Similar to the restoration approach, given the presence of historic features spanning several development periods, and the necessity of noncontributing features to support contemporary use, it is not desirable to remove features from one time period to highlight another. No records or documentation exists to accurately represent the original ca. 1831 core barn structure.

The Secretary of the Interior's Standards for Rehabilitation

The Secretary of the Interior's Standards for Rehabilitation are the criteria used to assist in the long-term preservation of historic materials and features. These standards pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and interior of historic buildings. The Standards also encompass related landscape features and the building's site and environment.

The following Standards are to be applied to specific rehabilitation projects at the Alley Spring site and Alley Mill in a reasonable manner, taking into consideration economic and technical feasibility.[179]

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

[178] Birnbaum and Peters, 127-129.

[179] https://www.nps.gov/tps/standards/rehabilitation.htm, accessed December 2024.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Rehabilitation Treatment in Stages

Rehabilitation of the historic barn would be required to be completed in a minimum of two complex stages.

Immediate Stabilization:

- The first stage would include emergency stabilization of the barn structure to prevent collapse and halt deterioration.

- This would include temporary shoring of the ca. 1831 barn timber framing west wall (posts and girders), temporary shoring of the south and west bays of the ca. 1868 addition roof and wall, and temporary waterproofing of the roof in these areas to prevent further water infiltration. Several other minor areas of roof and flashing leaks should also be addressed.

- Temporary stabilization is a potentially dangerous process for construction workers, as the barn is in imminent danger of collapse. The park has tried to contract this work in the past, with no luck finding a contractor willing to take on the liability of this difficult work.

- Stabilization must be designed by a structural engineer familiar with historic timber-frame structures. Design work may be by an NPS consultant or required as part of the General Contractor's team.

- This work will require immediate funding, will be expensive, and may not commence in time to prevent further collapse and deterioration of the barn.

Long-Term Rehabilitation:

- Long-term rehabilitation may be completed in stages, as the process would be complex. The ultimate treatment must respect the underlying historic resources of the site (both pre-contact and potentially of the Euro-American settlement). The barn sits within the cultural landscape of the Hopewell Mound Group's Great Enclosure, and the barn has been previously considered to be an intrusion. Evolution in the interpretation of historic sites may include keeping the barn as part of an effort to interpret the Euro-American settlement. If it is determined to save the barn structure, the following long-term treatment considerations should be carefully considered:
  - A full rehabilitation approach would consider the effect of the proposed work on the historic integrity of the structure and materials, as well as the potential reuse and/or interpretive value. For instance, while the structure is significant, the exterior cladding and roofing are well past their lifespan and should be completely replaced.
  - A rehabilitation of the barn structure will likely not meet current building code or life-safety standards for wind, shear, or snow loading without significant visible modifications or additional framing.
  - The rehabilitation process would consist of shoring, thoughtful deconstruction, documentation and preservation of materials, repairs, and replacement in kind of the existing historic timber framing, followed by reconstruction of the barn structure.
  - The period of significance is ca. 1831 – ca. 1868. The date of the existing siding and roofing are unknown, but date from this period or a later. Because this is not a restoration, rehabilitation would allow substitute materials of a similar nature. Therefore, the replacement of the deteriorated vertical wood siding and standing seam metal roofing is warranted with modern materials.
  - Selective Demolition and Salvaging by Qualified Historic Timber Framer: Rehabilitation of the historic barn will require skilled labor. Timber framing consultants have agreed that the best method to repair the significant damage to the wood frame structure is to deconstruct the barn so it may be laid flat on the ground or in a workshop to be repaired.
    - Carefully deconstruct the barn for an overall framing repair project. This would include documentation, shoring, and removal of the following: roofing materials and flashings; skip sheathing; pole rafters and sawn rafters; interior lofts (flooring and framing); all interior barn elements, such as the mangers and the waist walls; 1831 timber framing, built-in ladder, and the interior raised flooring structure and flooring; ca. 1868 addition timber framing; ca. salvaging stone piers; and demolition of the failing concrete flooring and footings along the south wall; and all related work.
  - Potential Impact to Archeological Resources:

        - All demolition must be completed carefully to protect the potential archeological resources below grade. Digging, trenching, or excavating into grade will require archeological monitoring. Full rehabilitation would likely trigger the need for a complete archeological study of the area.
        - Rehabilitation of the barn structure to contemporary standards would require new footings and tying the historic structure to the footings. This will destroy the historic stone piers and require extensive archeological investigation.
    - Reconstruction of the Historic Barn: Reconstruction may consist of the following work:
        - Re-grading of the site to provide positive drainage away from the barn structure and treat to prevent vines from re-growing.
            - Re-grading is not recommended due to potential archeological concerns.
        - Restructuring the existing stacked stone piers to provide footings to ensure sufficient bearing and support. Repair and stabilize existing concrete piers to remain. Reconstruct deteriorated and failing concrete structural piers along the south wall.
            - Destruction of historic resources and excavation are not recommended due to potential archeological concerns.
        - Repairs to the timber framing systems (ca. 1831 and 1868) with replacement wood timbers, where required. These repairs would be made in an off-site framing facility, where the structure can be laid flat to make the necessary repairs. New wood would be stamped with the year of the work. Restore the steel banding and tie rods and reinstall.
            - There is concern that a significant amount of the timber framing will be required to be replaced, with little historic integrity remaining.
        - Reconstruct the ca. 1831 and ca. 1868 timber frames on the restored piers and footings.
        - Reinstall the original pole rafters in the ca. 1831 section.
        - Reinstall the original sawn rafters in the ca. 1868 section. Sister ends of roof rafters, where deteriorated at eaves, or replace entire rafters, where needed.
        - Install new wood skip sheathing and new metal standing seam roof. Roofing options may include zinc-coated copper or a pre-finished metal standing seam roof.
        - Install new reproduction V-joint tongue and groove siding to match the existing siding. Install replacement barge boards.
        - Restore existing sliding barn door hardware to working condition.
        - Replace sliding barn door with replica door.
        - Construct replica pairs of swinging doors at south and west bays, and single doors at the man door and hay door on the east elevation.

- Repair the south and west window openings and sashes to original condition and replace damaged or missing trim or framing.
- Repair the interior floor sill beam and replace the missing floor joists. Reinstall original floor joists and flooring in their original locations. Where missing, install new wood flooring to match.
- Reinstall waste walls, mangers, and all other interior components.
- Option - Consider installing new gutters and downspouts to direct water away from the barn structure.
- Option - Install new electrical service and lighting, as well as security systems.
- Option - Consider pouring a new concrete floor in south bay.
- Option - Consider installing a certified lightning protection system.
- Option - Consider installing a parking area for park employees and visitors.
- Option - Consider installing an interpretive panel to present the barn history.

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1934 Aerial photograph of the Hopewell Mound Group, with the farmstead visible in the upper lefthand corner. (Hopewell Site Collection, Chicago: Field Museum http://hopewell.unl.edu/albums/hopewell44/#page/0/mode/1up.)

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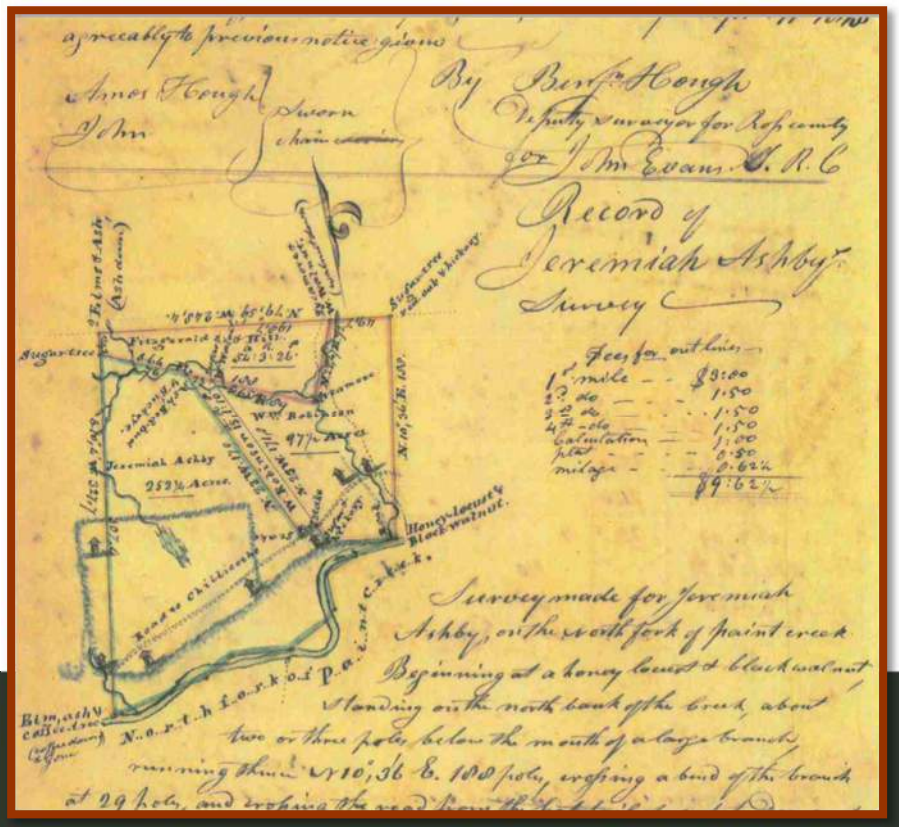
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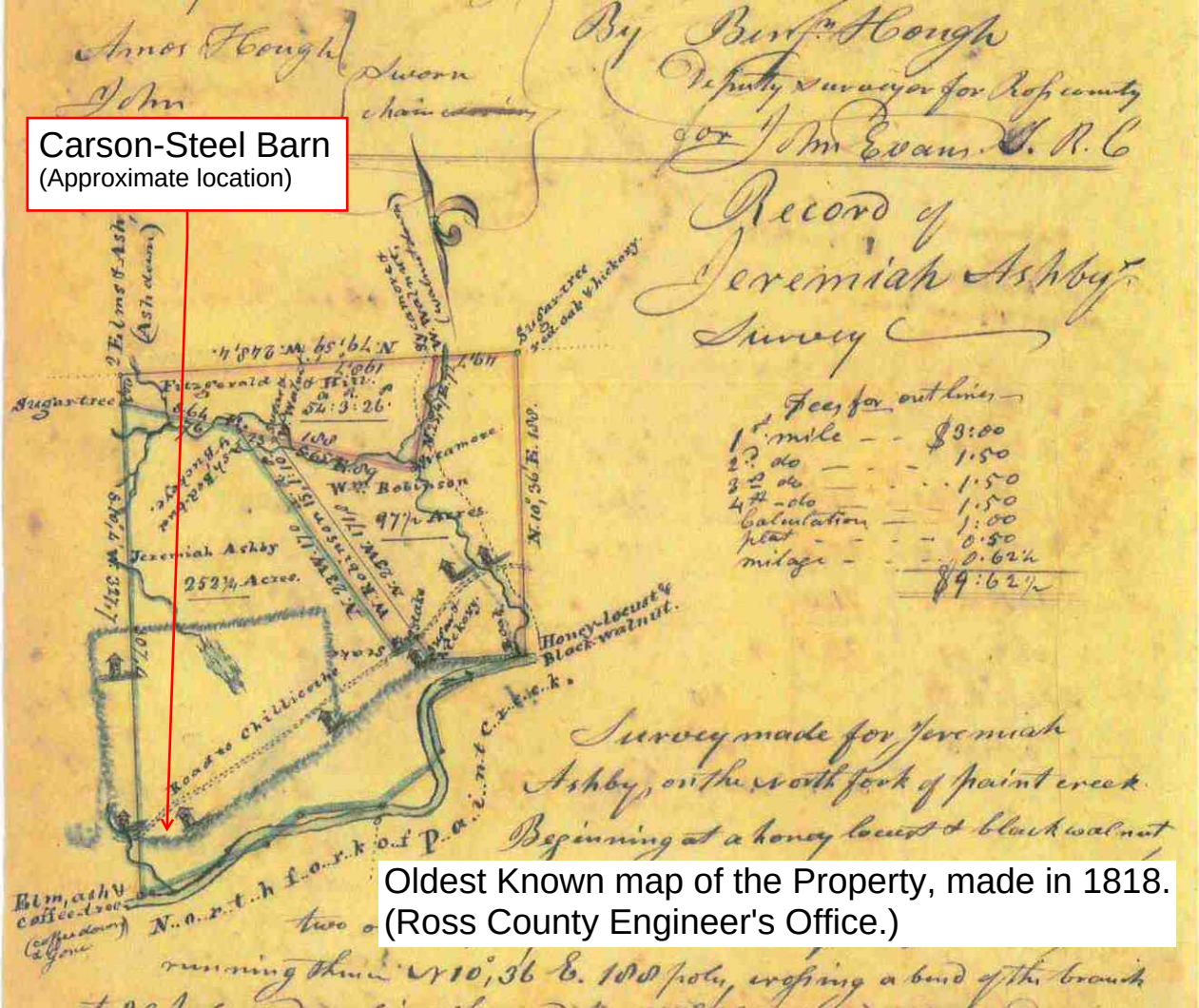
Aerial photograph of the farmstead taken in 1984. The Scribe Rule Barn is visible on the righthand side. (Vintage Aerials.com 2024)

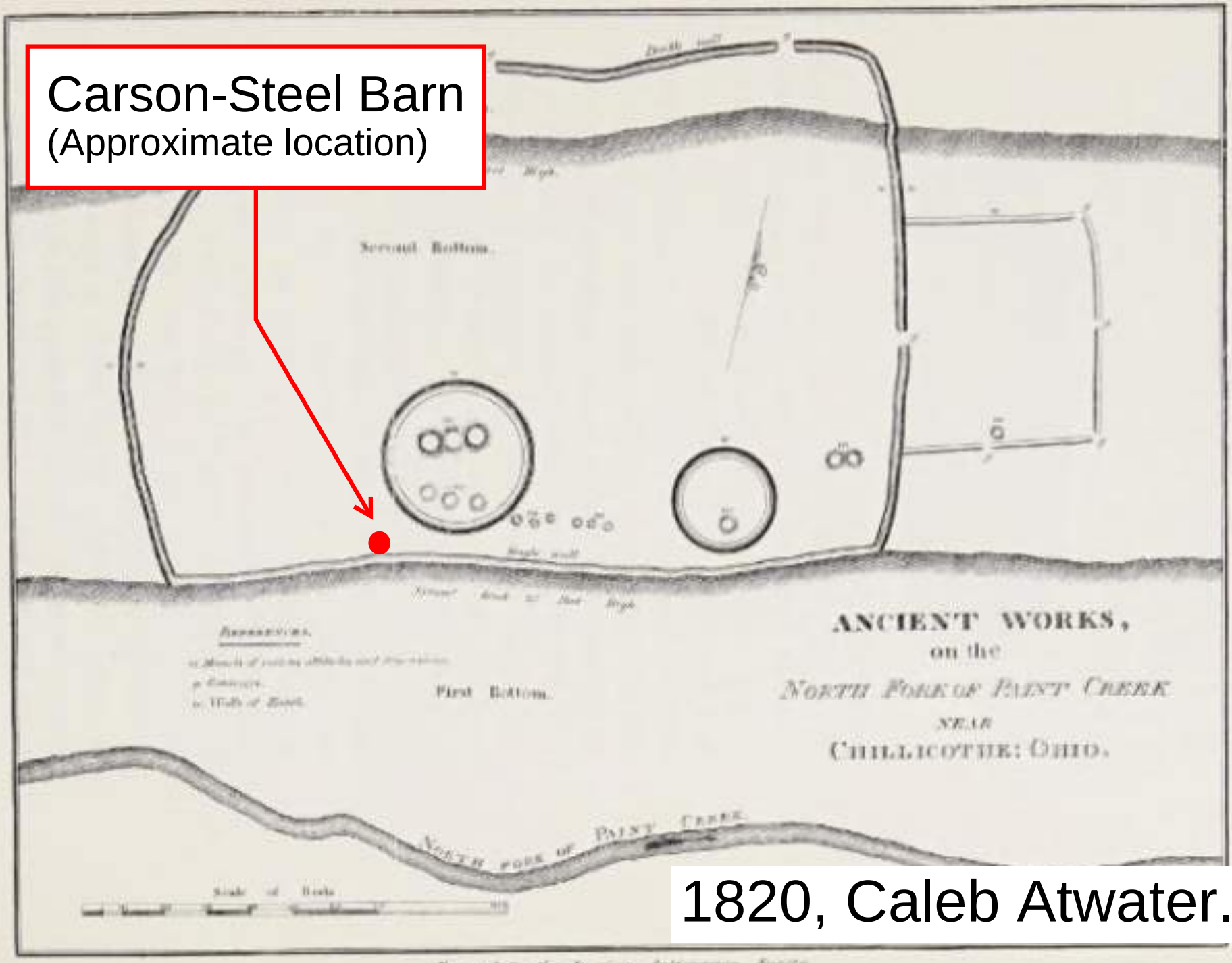
APPENDICES

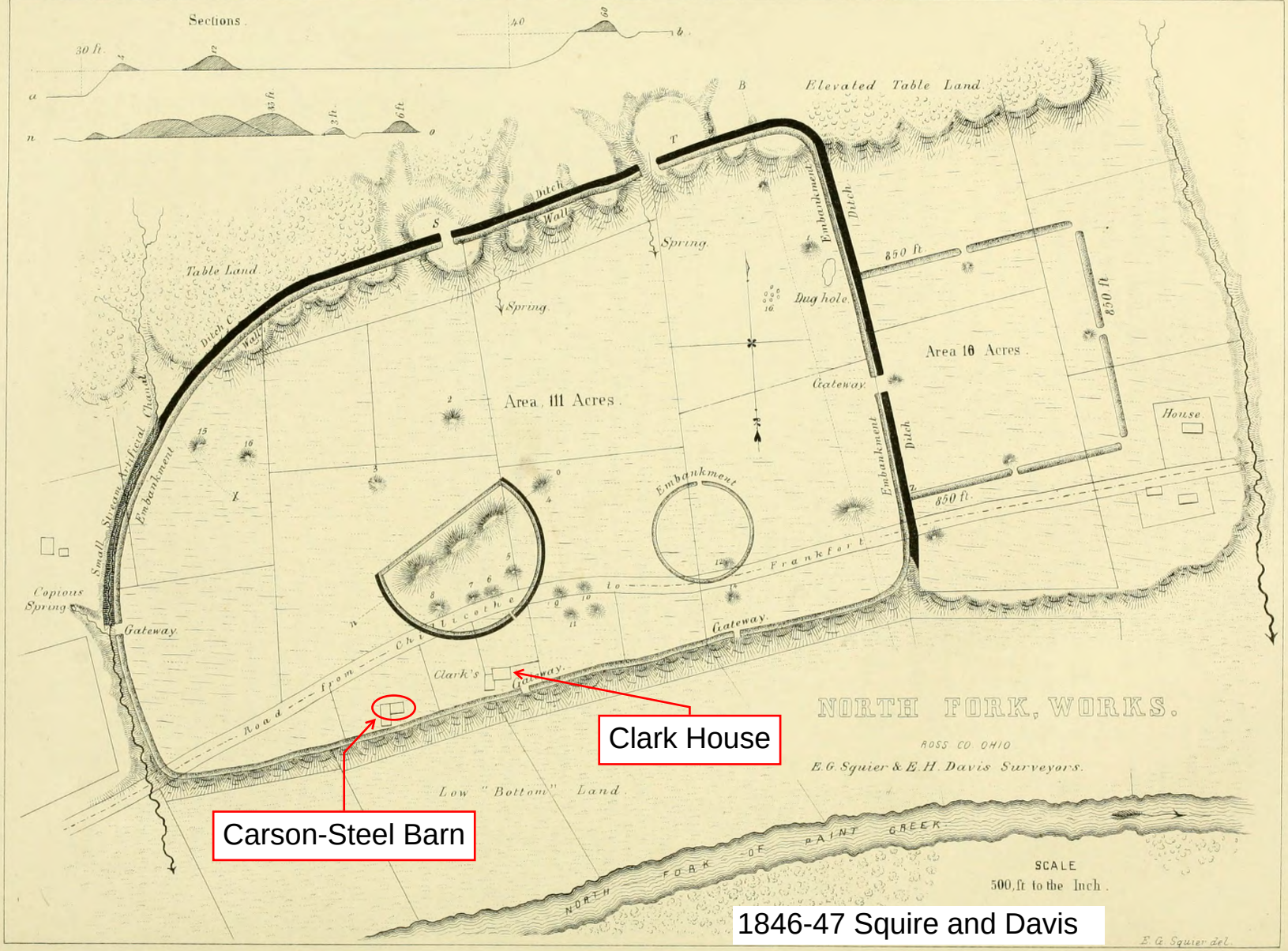


Oldest Known map of the Property, made in 1818. (Ross County Engineer's Office.)

A HISTORICAL MAPS


Carson-Steel Barn
(Approximate location)
Oldest Known map of the Property, made in 1818.
(Ross County Engineer's Office.)
Record of
Jeremiah Ashby's
Survey
Fees for outlines
1st mile - - $3:00
2d do - - - 1.50
3d do - - - 1.50
4th do - - - 1.50
Calculation - - 1:00
plat - - - - 0.50
milage - - - 0.62½
$9:62½
Jeremiah Ashby
252¾ Acres.
97½ Acres
Wm Robinson
Fitzgerald & Hill
54:3:26
Survey made for Jeremiah
Ashby on the north fork of paint creek
Beginning at a honey locust & black walnut

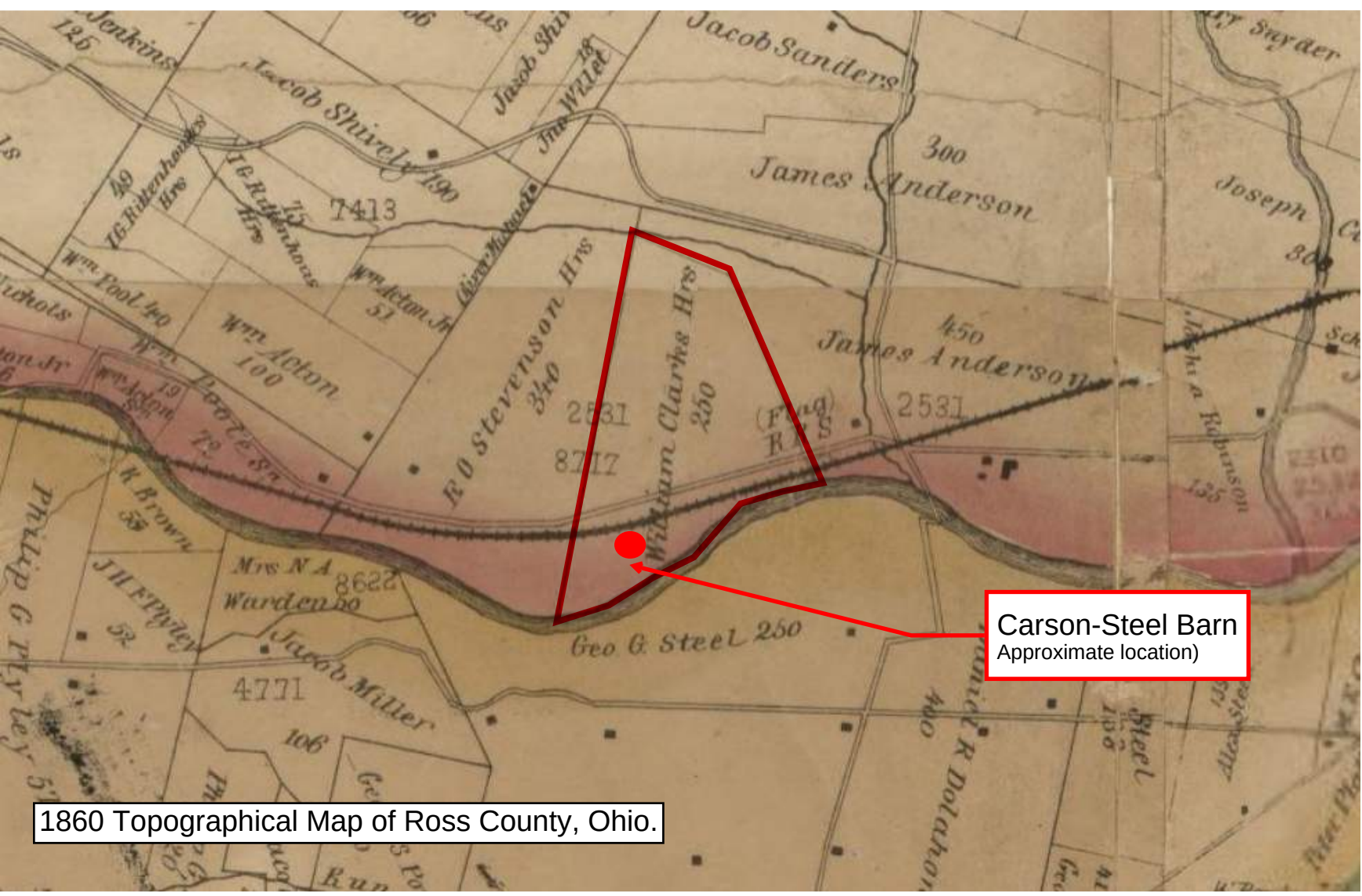

Carson-Steel Barn
(Approximate location)
Second Bottom.
First Bottom.
ANCIENT WORKS,
on the
NORTH FORK OF PAINT CREEK
NEAR
CHILLICOTHE: OHIO.
NORTH FORK OF PAINT CREEK
1820, Caleb Atwater.

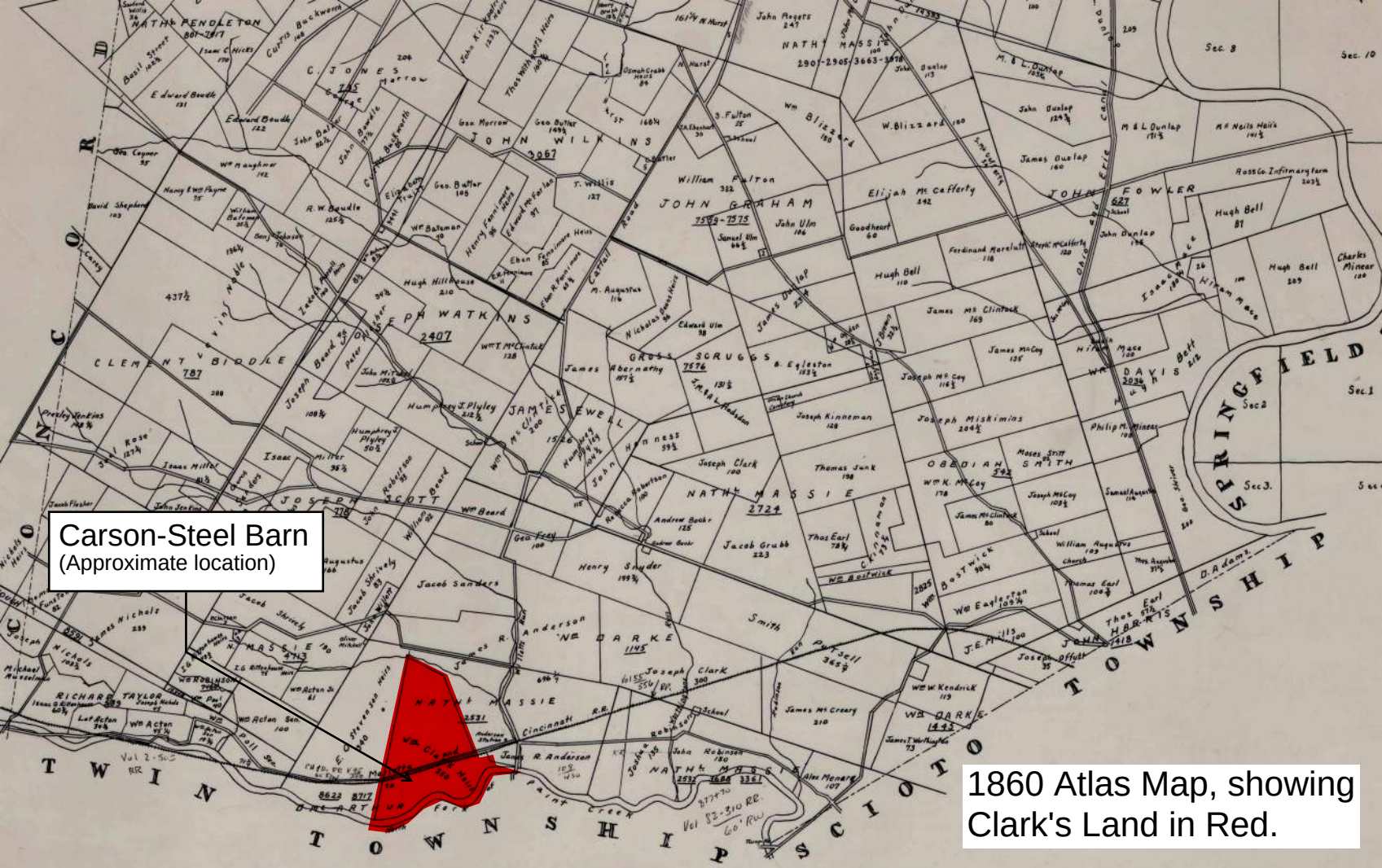


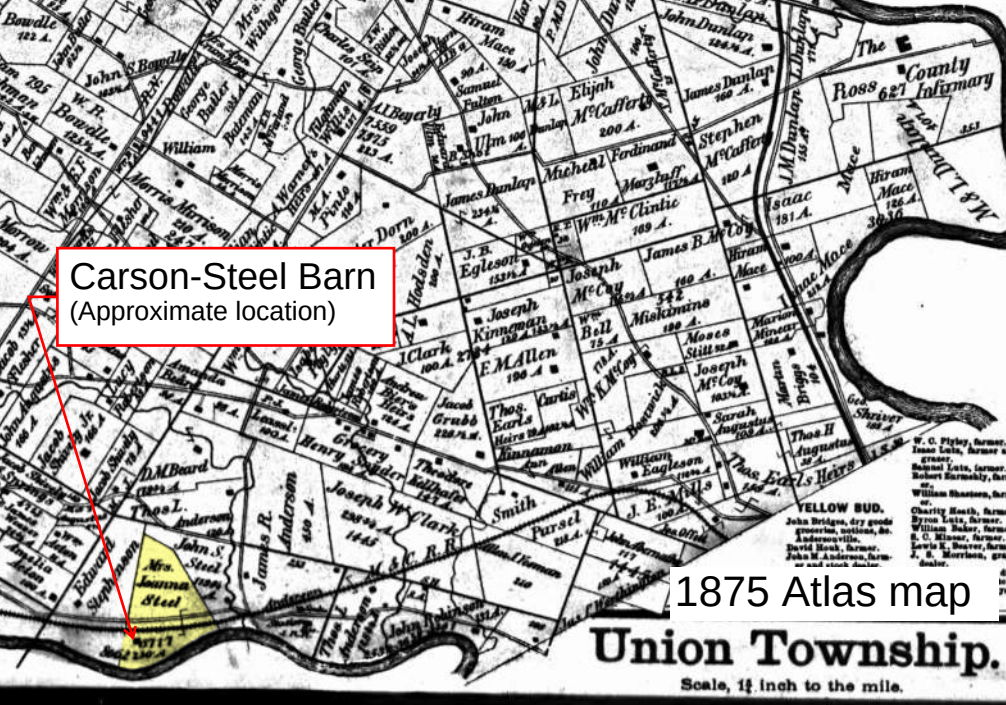
X.

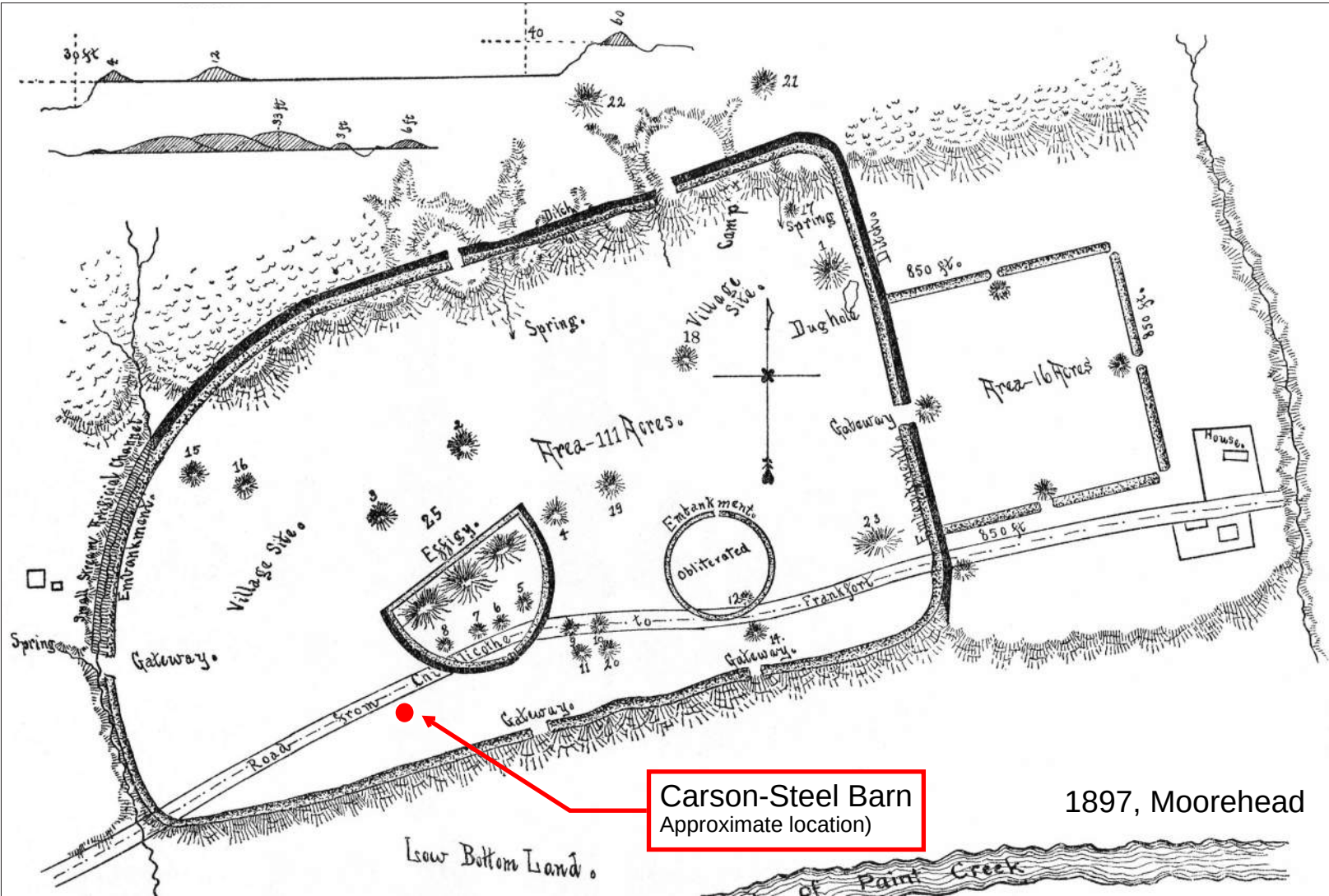
Face P 26.

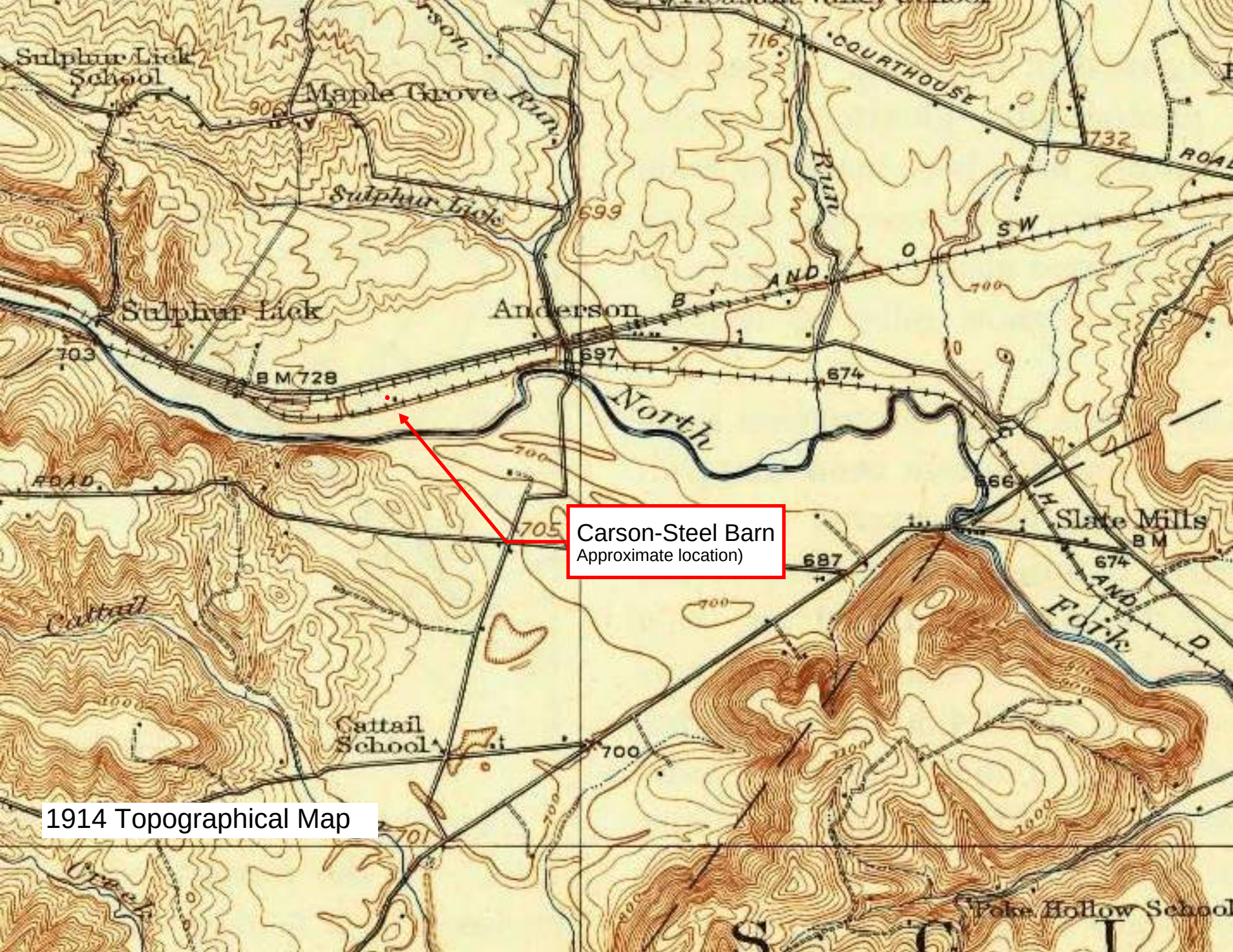
Lith. by Sarony & Major


Jacob Sanders
Jacob Shively 190
James Anderson 300
Joseph
7413
Wm Acton 100
Wm Acton
Wm Pool 140
R O Stevenson Hrs 340
William Clarke Hrs 250
James Anderson 450
2531
8717
Mrs N A Wardenbo 8622
Jacob Miller
4771
106
Geo G Steel 250
Carson-Steel Barn
Approximate location)
1860 Topographical Map of Ross County, Ohio.

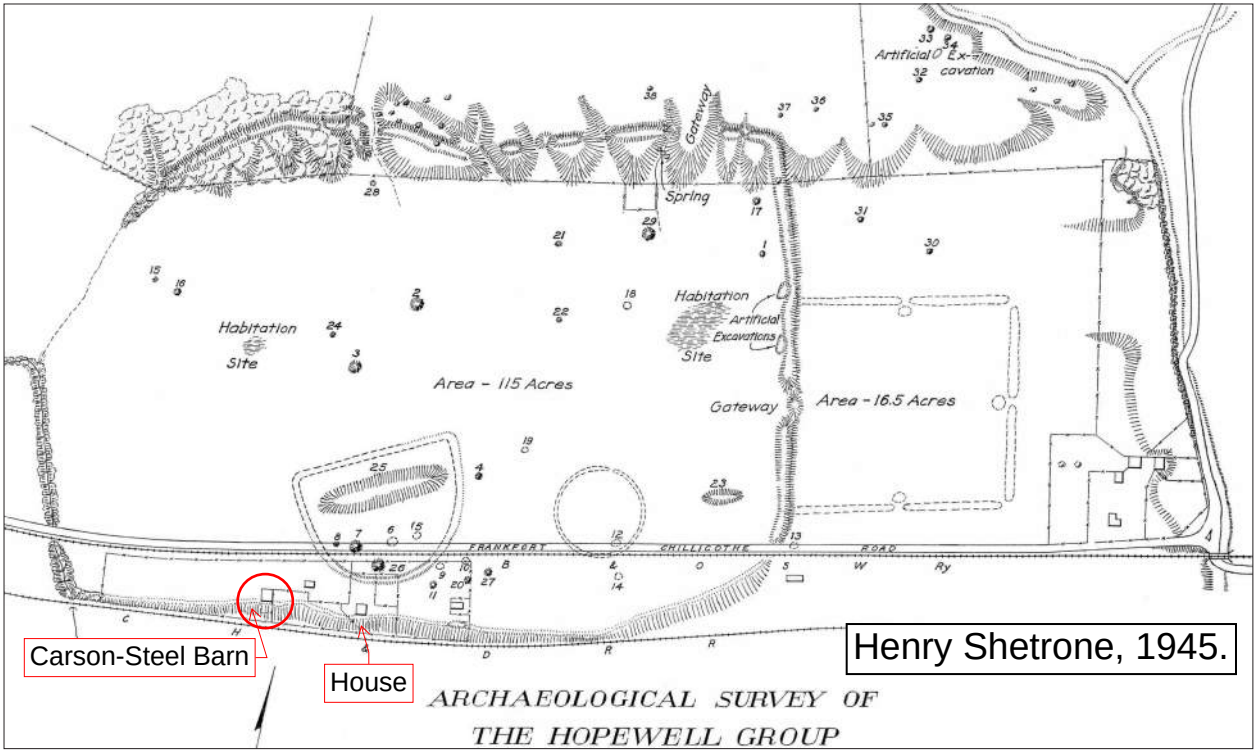

Carson-Steel Barn
(Approximate location)
1860 Atlas Map, showing Clark's Land in Red.
TWIN TOWNSHIP
SCIOTO TOWNSHIP
SPRINGFIELD TOWNSHIP
NATH'L MASSIE
JOHN WILKINS
JOHN GRAHAM
JOSEPH WATKINS
CLEMENT BIDDLE
JAMES SEWELL
JOSEPH SCOTT
OBEDIAH SMITH
JOHN FOWLER
WM DARKE
C. JONES
Cincinnati
Paint Creek

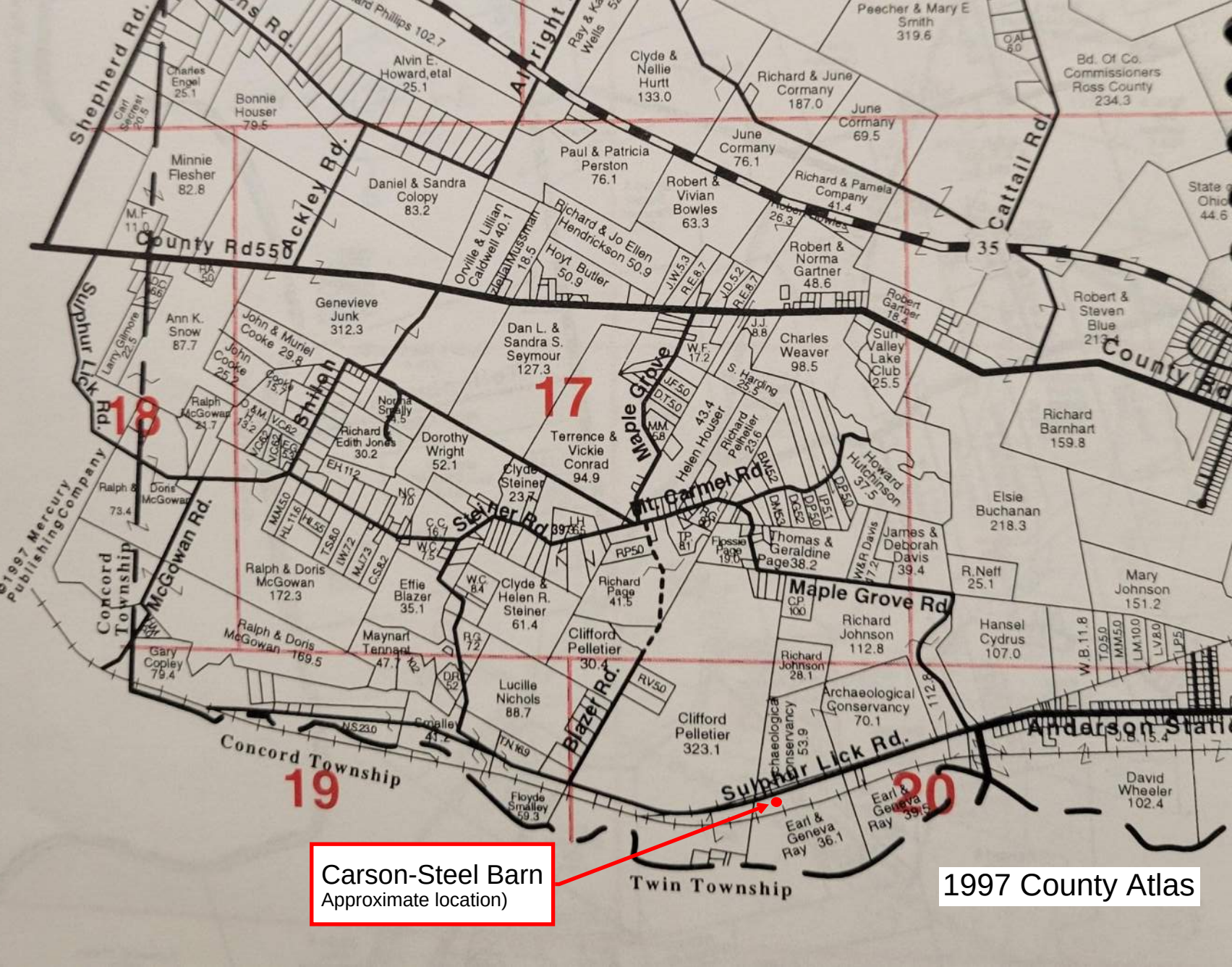

Carson-Steel Barn
(Approximate location)
1875 Atlas map
Union Township.
Scale, 1¼ inch to the mile.
Mrs. Joanna Steel
YELLOW BUD.


Carson-Steel Barn
Approximate location)
1897, Moorehead
Area-111 Acres.
Area-16 Acres
Village Site.
Effigy.
Embankment obliterated
Spring.
Gateway.
Road from Ch.
to Frankfort
Low Bottom Land.
of Paint Creek
Ditch
Camp
Dug hole
House.
850 ft.



1914 Topographical Map


Artificial Excavation
Gateway
Spring
Habitation Site
Habitation Artificial Excavations Site
Area - 115 Acres
Gateway
Area - 16.5 Acres
FRANKFORT CHILLICOTHE ROAD
Carson-Steel Barn
House
Henry Shetrone, 1945.
ARCHAEOLOGICAL SURVEY OF
THE HOPEWELL GROUP


Carson-Steel Barn
Approximate location)
1997 County Atlas
Concord Township
Twin Township
Sulphur Lick Rd.
Maple Grove Rd
Mt. Garmel Rd.
Steiner Rd.
McGowan Rd.
Blazer Rd.
Maple Grove
Ackley Rd.
Shepherd Rd.
Cattail Rd.
County Rd55
35
17
18
19
20
Clyde & Nellie Hurtt 133.0
Richard & June Cormany 187.0
June Cormany 69.5
June Cormany 76.1
Paul & Patricia Perston 76.1
Robert & Vivian Bowles 63.3
Richard & Pamela Company 41.4
Robert & Norma Gartner 48.6
Charles Weaver 98.5
Sun Valley Lake Club 25.5
Richard Barnhart 159.8
Robert & Steven Blue
Howard Hutchinson 37.5
Elsie Buchanan 218.3
James & Deborah Davis 39.4
R.Neff 25.1
Mary Johnson 151.2
Hansel Cydrus 107.0
Richard Johnson 112.8
Richard Johnson 28.1
Archaeological Conservancy 70.1
Archaeological Conservancy 53.9
Clifford Pelletier 323.1
Clifford Pelletier 30.4
Lucille Nichols 88.7
Maynard Tennant 47.7
Gary Copley 79.4
Ralph & Doris McGowan 169.5
Ralph & Doris McGowan 172.3
Effie Blazer 35.1
Clyde & Helen R. Steiner 61.4
Richard Page 41.5
Clyde Steiner 23.7
Terrence & Vickie Conrad 94.9
Dorothy Wright 52.1
Richard & Edith Jones 30.2
Ralph McGowan 21.7
Ralph & Doris McGowan 73.4
Genevieve Junk 312.3
Ann K. Snow 87.7
John & Muriel Cooke 29.8
Dan L. & Sandra S. Seymour 127.3
Helen Houser 43.4
Richard Pelheiler 23.6
Thomas & Geraldine Page 38.2
Flossie Page 19.0
Minnie Flesher 82.8
Daniel & Sandra Colopy 83.2
Orville & Lillian Caldwell 40.1
Zella Mussman 18.5
Hoyt Butler 50.9
Richard & Jo Ellen Hendrickson 50.9
Robert & Norma Gartner 48.6
Alvin E. Howard, etal 25.1
Bonnie Houser 79.5
Charles Engel 25.1
Peecher & Mary E Smith 319.6
Bd. Of Co. Commissioners Ross County 234.3
Ray & Ka... Wells
Richard Phillips 102.7
Robert Gartner 18.4
Robert Gartner 26.3
Floyde Smalley 59.3
Earl & Geneva Ray 36.1
Earl & Geneva Ray 39.5
David Wheeler 102.4
Anderson State
Sulphur Lick Rd.
Concord Township
Twin Township



Nick Wiesenberg of The College of Wooster Tree Ring Lab taking a core sample.
(STRATA 2023)

B DENDROCHRONOLOGY REPORT

Dendrochronological Dating of the Hopewell Culture National Historic Park Barn in Chillicothe, Ohio

Sampled Wednesday October 25, 2023 by Nick Wiesenberg

The College of Wooster Tree Ring Lab
Department of Earth Sciences
944 College Mall
Wooster, OH 44691
Tel: 330-263-2445 nwiesenberg@wooster.edu
http://treering.voices.wooster.edu/

Objective:

To provide a calendar date using dendrochronology for the felling of timber used to build the Hopewell Culture National Historic Park (HOCU) barn in Chillicothe, Ohio. Core samples and tree-ring data is archived at the Wooster Tree Ring Lab, housed in the Department of Earth Sciences, The College of Wooster.

General:

Dendrochronology is the science of analyzing and dating annual growth rings in trees. Its first application was in the dating of ancient Indian pueblos of the southwestern United States (Douglass 1921, 1929). Andrew E. Douglass is considered the "father" of dendrochronology and developed the application of tree ring data to archaeological dating. The dendrochronological methods first developed by Douglass have evolved and been employed throughout North America, Europe, and much of the temperate forest zones around the world (Baillie, 1995; Wiles and Wiesenberg, 2018).

Methods and Analysis:

Core samples were taken throughout the barn and shed additions from timbers which contained visible outer rings. All samples were prepared and cross-dated using standard dendrochronological techniques (Holmes, 1983; Stokes and Smiley, 1968). The core samples were carefully glued into grooved mounts and sanded to a high polish to reveal the annual tree rings clearly. The rings widths were then measured under a microscope to a precision of ±0.001 mm. and then cross-dated against each other (*Figure 1*). The cross dating of the measurements was facilitated by the COFECHA computer program.

COFECHA is used to first establish internal or relative cross dating among individual samples. This step is critical because it locks in the relative positions of the timbers to each other, and indicates whether or not the dates of those specimens with outer rings are consistent. Subsequently, the internally cross-dated series are each compared with independently established tree-ring master chronologies compiled from living trees and dated historical tree-ring samples. All of the master chronologies are based on completely independent tree-ring samples and are derived from over 300 ring-width series from old growth living trees and historical structures across southern Ohio. All dating results were verified by comparison with independent dating masters and in each case the dating reported here is verified as correct *(Figure 2)*.

Results:

The original barn frame, cut and converted by axe from trees within a once dense hardwood forest, was constructed from almost exclusively white oak timber. Slippery elm (easily mistaken for American chestnut), was also selected for the main frame's pole rafters and several hand-hewn posts used throughout the shed addition. Twelve total core samples cumulatively containing over 200 years of annual ring data *(Table 1)* were carefully collected and successfully cross-dated against the 350-year southern Ohio regional master chronology. Correlation results were high aside from a 50-year duration of extrememly slow growth found in sample HOCU6 *(Figure 2)*. Upon visual evaluation of the outermost ring on each sample within the original frame, it was discovered that the trees used to build the structure had been cut over three consecutive years: 1828, 1829, and 1830 while the timbers sampled from the shed addition all shared an outermost ring of 1867 (*Figure 3*). These results suggest that settlers commenced to clear the land several years prior to the construction of the barn, which most likely saw a raising date in either late 1830 or early 1831. The shed additions would have been added to the structure no earlier than 1867 with all likelihood pointing to the shed addition work being completed in 1868.

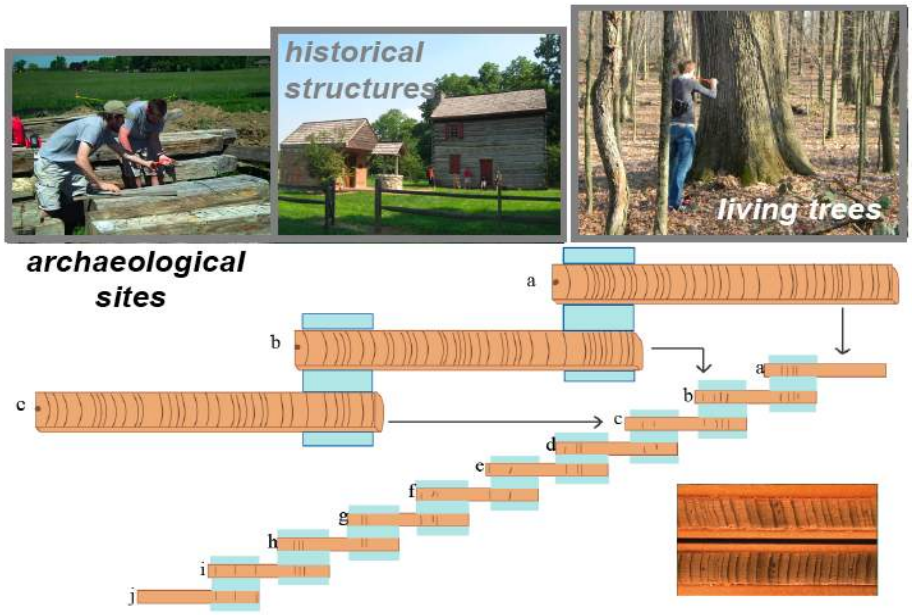
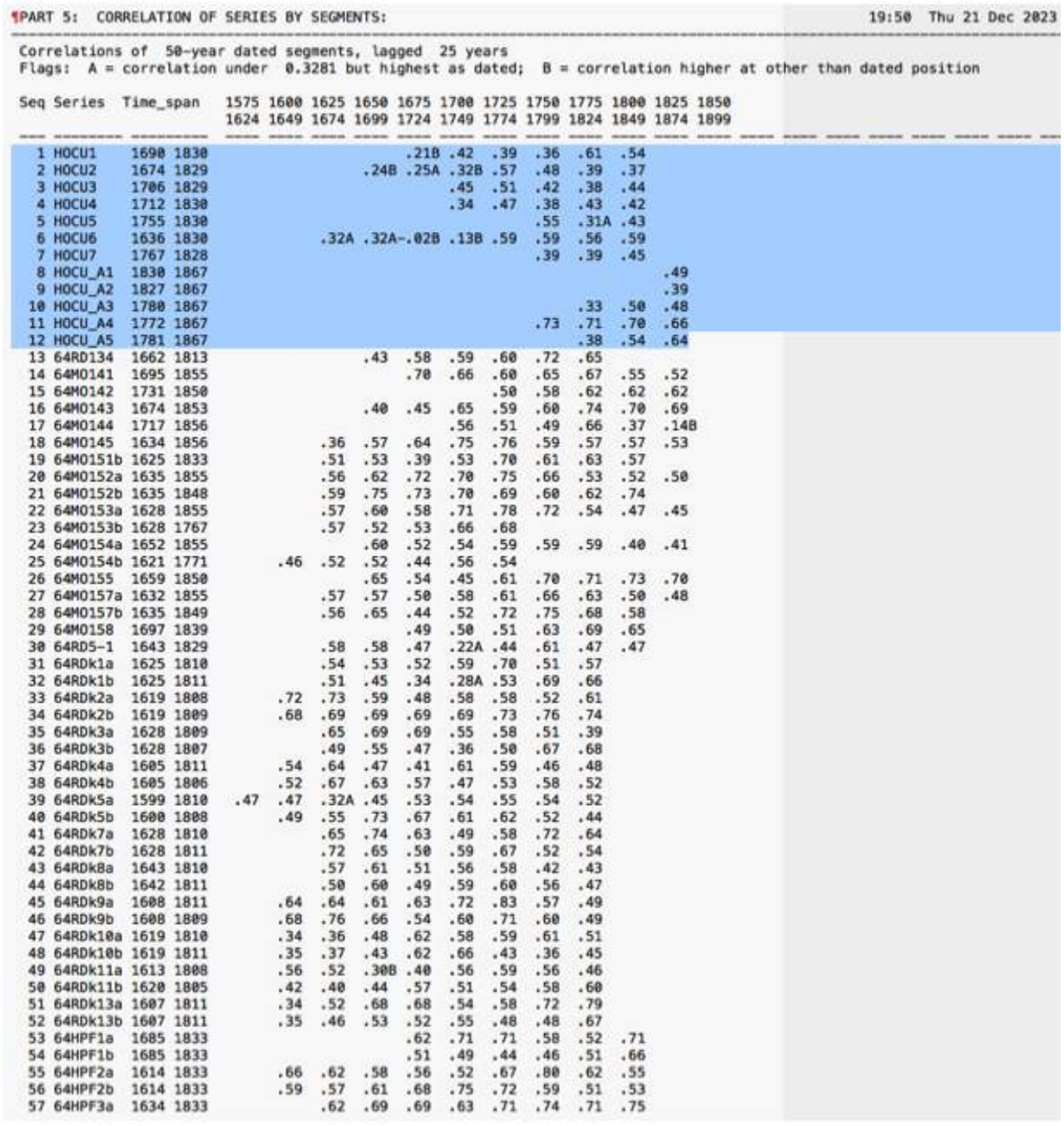


Figure 1. Diagram illustrating tree-ring cross-dating. Patterns in ring widths from archaeological and historic structures are compared to living tree ring chronologies in order to assign calendar dates to each ring.



PART 5: CORRELATION OF SERIES BY SEGMENTS: 19:50 Thu 21 Dec 2023

Correlations of 50-year dated segments, lagged 25 years
Flags: A = correlation under 0.3281 but highest as dated; B = correlation higher at other than dated position

Seq	Series	Time_span	1575 1624	1600 1649	1625 1674	1650 1699	1675 1724	1700 1749	1725 1774	1750 1799	1775 1824	1800 1849	1825 1874	1850 1899
1	HOCU1	1690 1830					.21B	.42	.39	.36	.61	.54		
2	HOCU2	1674 1829				.24B	.25A	.32B	.57	.48	.39	.37		
3	HOCU3	1706 1829						.45	.51	.42	.38	.44		
4	HOCU4	1712 1830						.34	.47	.38	.43	.42		
5	HOCU5	1755 1830								.55	.31A	.43		
6	HOCU6	1636 1830			.32A	.32A	-.02B	.13B	.59	.59	.56	.59		
7	HOCU7	1767 1828								.39	.39	.45		
8	HOCU_A1	1830 1867											.49	
9	HOCU_A2	1827 1867											.39	
10	HOCU_A3	1780 1867									.33	.50	.48	
11	HOCU_A4	1772 1867								.73	.71	.70	.66	
12	HOCU_A5	1781 1867									.38	.54	.64	
13	64RD134	1662 1813				.43	.58	.59	.60	.72	.65			
14	64MO141	1695 1855					.70	.66	.60	.65	.67	.55	.52	
15	64MO142	1731 1850							.50	.58	.62	.62	.62	
16	64MO143	1674 1853				.40	.45	.65	.59	.60	.74	.70	.69	
17	64MO144	1717 1856						.56	.51	.49	.66	.37	.14B	
18	64MO145	1634 1856			.36	.57	.64	.75	.76	.59	.57	.57	.53	
19	64MO151b	1625 1833			.51	.53	.39	.53	.70	.61	.63	.57		
20	64MO152a	1635 1855			.56	.62	.72	.70	.75	.66	.53	.52	.50	
21	64MO152b	1635 1848			.59	.75	.73	.70	.69	.60	.62	.74		
22	64MO153a	1628 1855			.57	.60	.58	.71	.78	.72	.54	.47	.45	
23	64MO153b	1628 1767			.57	.52	.53	.66	.68					
24	64MO154a	1652 1855				.60	.52	.54	.59	.59	.59	.40	.41	
25	64MO154b	1621 1771		.46	.52	.52	.44	.56	.54					
26	64MO155	1659 1850				.65	.54	.45	.61	.70	.71	.73	.70	
27	64MO157a	1632 1855			.57	.57	.50	.58	.61	.66	.63	.50	.48	
28	64MO157b	1635 1849			.56	.65	.44	.52	.72	.75	.68	.58		
29	64MO158	1697 1839					.49	.50	.51	.63	.69	.65		
30	64RD5-1	1643 1829			.58	.58	.47	.22A	.44	.61	.47	.47		
31	64RDk1a	1625 1810			.54	.53	.52	.59	.70	.51	.57			
32	64RDk1b	1625 1811			.51	.45	.34	.28A	.53	.69	.66			
33	64RDk2a	1619 1808		.72	.73	.59	.48	.58	.58	.52	.61			
34	64RDk2b	1619 1809		.68	.69	.69	.69	.69	.73	.76	.74			
35	64RDk3a	1628 1809			.65	.69	.69	.55	.58	.51	.39			
36	64RDk3b	1628 1807			.49	.55	.47	.36	.50	.67	.68			
37	64RDk4a	1605 1811		.54	.64	.47	.41	.61	.59	.46	.48			
38	64RDk4b	1605 1806		.52	.67	.63	.57	.47	.53	.58	.52			
39	64RDk5a	1599 1810	.47	.47	.32A	.45	.53	.54	.55	.54	.52			
40	64RDk5b	1600 1808		.49	.55	.73	.67	.61	.62	.52	.44			
41	64RDk7a	1628 1810			.65	.74	.63	.49	.58	.72	.64			
42	64RDk7b	1628 1811			.72	.65	.50	.59	.67	.52	.54			
43	64RDk8a	1643 1810			.57	.61	.51	.56	.58	.42	.43			
44	64RDk8b	1642 1811			.50	.60	.49	.59	.60	.56	.47			
45	64RDk9a	1608 1811		.64	.64	.61	.63	.72	.83	.57	.49			
46	64RDk9b	1608 1809		.68	.76	.66	.54	.60	.71	.60	.49			
47	64RDk10a	1619 1810		.34	.36	.48	.62	.58	.59	.61	.51			
48	64RDk10b	1619 1811		.35	.37	.43	.62	.66	.43	.36	.45			
49	64RDk11a	1613 1808		.56	.52	.30B	.40	.56	.59	.56	.46			
50	64RDk11b	1620 1805		.42	.40	.44	.57	.51	.54	.58	.60			
51	64RDk13a	1607 1811		.34	.52	.68	.68	.54	.58	.72	.79			
52	64RDk13b	1607 1811		.35	.46	.53	.52	.55	.48	.48	.67			
53	64HPF1a	1685 1833					.62	.71	.71	.58	.52	.71		
54	64HPF1b	1685 1833					.51	.49	.44	.46	.51	.66		
55	64HPF2a	1614 1833		.66	.62	.58	.56	.52	.67	.80	.62	.55		
56	64HPF2b	1614 1833		.59	.57	.61	.68	.75	.72	.59	.51	.53		
57	64HPF3a	1634 1833			.62	.69	.69	.63	.71	.74	.71	.75		

Figure 2. Annual tree ring-width correlations shown in COFECHA from the master southern Ohio regional ring-width chronology compared to the historic ring-width dataset from the HOCU barn (highlighted in blue).



Figure 3. Image of three cores taken from the HOCU barn. The asterisk annotates a fully-formed outermost ring on each sample and may be cross referenced with the table below.

Core ID	Date Span	Species	Beam Description (STRATA blueprint reference code)
HOCU1	1690-1830	white oak	hand-hewn girt (EC-S1)
HOCU2	1674-1829	white oak	hand-hewn post (S1)
HOCU3	1706-1829	white oak	Hand-hewn girt (N2-N3)
HOCU4	1712-1830	white oak	hand-hewn knee brace (N2 brace II)
HOCU5	1755-1830	white oak	hand-hewn sill (S1-EC)
HOCU6	1636-1830	white oak	Hand-hewn sill (S2-S3)
HOCU7	1767-1828	slippery elm	pole rafter (#5 south)
HOCU_A1	1830-1867	slippery elm	Hand-hewn post (NB2)
HOCU_A2	1827-1867	slippery elm	Hand-hewn post (NB3)
HOCU_A3	1780-1867	white oak	circular sawn girt (N2-NB2)
HOCU_A4	1772-1867	white oak	circular sawn rafter (#3 south)
HOCU_A5	1781-1867	white oak	circular sawn rafter (#7 south)

Table 1. Tree core sample data from the HOCU barn. Samples HOCU1-7 were collected from the original frame. Samples HOCU_A1-5 were collected from the shed addition.

References:

Baillie, M.G.L. 1995, A Slice Through Time: Dendrochronology and Precision Dating. B.T. Batsford, Ltd., London

Douglass, A.E. 1921, Dating our prehistoric ruins: how growth rings in trees aid in the establishing the relative ages of the ruined pueblos of the southwest. Natural History 21(1), 27-30

Douglass, A.E. 1929, The secret of the southwest solved by talkative tree-rings. National Geographic Magazine 56(6), 736-770.

Holmes, R. L. 1983. Computer-assisted quality control in tree-ring dating and measurement. *Tree Ring Bulletin*, 43 (1), 69-78.

Stokes M. A., and Smiley, T. L., 1968, An introduction to tree-ring dating: Tucson: University of Arizona Press.

Wiles, G. C., and Wiesenberg, N., 2018, Dating Ohio's history with tree rings: The Ohio Woodland Journal, v. 25(4), p. 18-22.



Interior image of the HOCU barn.



Extracting a core from the hand-powered increment borer.



1875 Ross County Atlas Map. Joanna Steel's Farm is highlighted. The barn is indicated by a red dot. (1875 Atlas of Ross County, Ohio, 73.)

C REAL ESTATE TAX RECORDS

Appendix C. Real Estate Tax Records

Early county tax records provide information about owners of record as well as assessed value of real and personal property. Starting in 1826, those records begin specifically recording houses as well as acreage owned. Barns and outbuildings were not included in any of the tax records listed below.

	Owner (Union Twp unless otherwise noted)	**Acres**	**Original VMS**	**Land Value**	**House Description and Value**	**Total Value**	**Notes**
	Personal Property Listings: Horses, Cows, M (Money at Interest, Merchant Capital)						
	Preconstruction						
1820	Jeremiah Ashby	200	2531	not shown	not listed		
1820	Jeremiah Ashby	50	8717	not shown	not listed		
1820	Daniel Ashby	55.5	2531	not shown			
1823	Jeremiah Ashby	200	2531				
1823	Jeremiah Ashby	50	8717				
1823	Daniel Ashby not listed						
	Up to 1825 real estate in Ohio was taxed only on the quality of the land, with no consideration for buildings or other improvements. In 1825, they changed to an ad valorem system, which taxed buildings as well as land. (https://dam.assets.ohio.gov/image/upload/tax.ohio.gov/taxeducation/history/taxation%20in%20ohio_history.pdf. Accessed Feb 2025.)						
1826	Jeremiah Ashby	200	2531	2150		2150	first book that shows houses
1826	Jeremiah Ashby	50	8717	528		2680	
1826	Daniel Ashby	55.5	2531	244		244	
1827	Jeremiah Ashby	200	2531	2152		2152	
1827	Jeremiah Ashby	50	8717	528		2680	
1827	Daniel Ashby	55.5	2531	244		244	
1828	Jeremiah Ashby	200	2531	2152		2352	
1828	Jeremiah Ashby	10	8717	105		105	
1828	Jeremiah Ashby	40	8717	423		423	
1828	Jeremiah Ashby, Personal Prop, 2 Horse, 2 Cow, no M						
1828	Daniel Ashby	55.5	2531	244		244	
1828	Daniel Ashby, Personal Prop, 1 Horse, 2 Cow, no M						
1829	Jeremiah Ashby	149	2531	1604		1604	
1829	Jeremiah Ashby	10	8717	105		105	
1829	Jeremiah Ashby	40	8717	423		423	
1829	Jeremiah Ashby, Personal Prop, 2 Horse, 1 Cow, no M						
1829	Daniel Ashby	55.5	2531	244		244	
1829	Daniel Ashby	51	2531	548	1 Frame 200	748	First recorded Ashby house
1829	Jeremiah Ashby, 2 Horses, 1 Cow, no M						
1829	Daniel Ashby 1 Horse, 1 Cow, no M						
1829	Benjamin Ashby, 2 Horses, 2 Cow, no M						

Appendix C. Real Estate Tax Records

Early county tax records provide information about owners of record as well as assessed value of real and personal property. Starting in 1826, those records begin specifically recording houses as well as acreage owned. Barns and outbuildings were not included in any of the tax records listed below.

	Owner (Union Twp unless otherwise noted)	**Acres**	**Original VMS**	**Land Value**	**House Description and Value**	**Total Value**	**Notes**
	Personal Property Listings: Horses, Cows, M (Money at Interest, Merchant Capital)						
1829	Abraham and Elija Ashby each 1 Horse, 1 Cow, no M						
	Jeremiah and Daniel Ashby sell a total of 250 acres to William Carson in 1829						
	Episode I: 1829-1867						
1830	Jeremiah Ashby	149	2531	1604		1604	
1830	Jeremiah Ashby	10	8717	105		105	
1830	Jeremiah Ashby	40	8717	423		423	
1830	Daniel Ashby	55.5	2531	244		244	
1830	Daniel Ashby	51	2531	548	1 Frame 200	748	
1830	William Carson Scioto Twp. Personal Prop, 1 Horse, 1 Cow, $6000						
1831	Jeremiah Ashby	149	2531	1604		1604	
1831	Jeremiah Ashby	10	8717	105		105	
1831	Jeremiah Ashby	40	8717	423		423	
1831	Jeremiah Ashby, Union Twp. Personal Prop, 3 Horses, 1 Cow, no M						
1831	Daniel Ashby	55.5	2531	244		244	
1831	Daniel Ashby	51	2531	548	1 Frame 200	748	
1831	Wiliam C. Clark Personal Prop, 3 Horses, 1 Cow, no M						
1831	William Carson Personal Prop, 2 Horses, 1 Cow, $6000						
1832	Jeremiah Ashby	149	2531	1604		1604	
1832	Jeremiah Ashby	50	8717	528		528	
1832	Jeremiah Ashby Personal Prop, 2 Horses, 2 Cows, no M						
	Jeremiah Ashby's children Elijah, and Eli also had personal property listed						
1832	Daniel Ashby	55.5	2531	244	Note: "Saml Hillhouse"	244	
1832	Daniel Ashby	51	2531	548	1 Frame 200	748	
1832	Delinquent personal prop list includes Jeremiah, Elijah, and Eli Ashby, with the note "absconded"						
1833	Jeremiah Ashby	149	2531	1604		1604	
1833	Jeremiah Ashby	50	8717	528		528	
1833	Daniel Ashby	55.5	2531	244	"Saml Hillhouse"	244	
1833	Daniel Ashby	51	2531	548	1 Frame 200	748	
	William Carson sells the 250-acre property to William C. Clark in 1833						
1834	Jeremiah Ashby	149	2531	1604			
1834	Jeremiah Ashby	50	8717	528			

Appendix C. Real Estate Tax Records

Early county tax records provide information about owners of record as well as assessed value of real and personal property. Starting in 1826, those records begin specifically recording houses as well as acreage owned. Barns and outbuildings were not included in any of the tax records listed below.

	Owner (Union Twp unless otherwise noted)	**Acres**	**Original VMS**	**Land Value**	**House Description and Value**	**Total Value**	**Notes**
	Personal Property Listings: Horses, Cows, M (Money at Interest, Merchant Capital)						
1834	Daniel Ashby	106	2531	548			
1834	William Carson owned 100 acres and a brick house in Scioto Twp.						
1834	William Clark 3 Horses, 3 Cows, no M Union Twp.						
1834	William Carson Scioto Twp Personal Prop, 22 Horses, 5 Cows, no M						
1835	William C. Clark	200	2531	1490		1490	
1835	William C. Clark	50	8717	849		849	
1835	William Clark 1 Horse, 1 Cows, no M						One of two entries for Wm Clark
	William Clark 4 horses, 33 Cows, no M						
	William Carson Scioto Twp 1 Horse ,1 Cow, $6,000						
1836	William C. Clark	200	2531	1490		1490	
1836	William C. Clark	50	8717	849		849	
1837	William C. Clark	200	2531	1490		1490	
1837	William C. Clark	50	8717	849		849	
1838	William C. Clark	200	2531	1490		1490	
1838	William C. Clark	50	8717	849		849	
1838	William Carson, Personal Prop, 2 Horses, 2 Cows, $3500 or $5500						
1839	William C. Clark	200	2531	1490		1490	
1839	William C. Clark	50	8717	849		849	
1840	William C. Clark	200	2531	1490		1490	
1840	William C. Clark	50	8717	849		849	
1841	William C. Clark	200	2531	1680	Br. House 960	2640	Second house recorded
1841	William C. Clark	50	8717	780		780	
1843	William C. Clark	200	2531	1680	Br. House 960	2640	
1843	William C. Clark	50	8717	780		780	
1845	William C. Clark	200	2531	1680	Br. House 960	2640	
1845	William C. Clark	50	8717	780		780	

Appendix C. Real Estate Tax Records

Early county tax records provide information about owners of record as well as assessed value of real and personal property. Starting in 1826, those records begin specifically recording houses as well as acreage owned. Barns and outbuildings were not included in any of the tax records listed below.

	Owner (Union Twp unless otherwise noted)	**Acres**	**Original VMS**	**Land Value**	**House Description and Value**	**Total Value**	**Notes**
	Personal Property Listings: Horses, Cows, M (Money at Interest, Merchant Capital)						
1847	William C. Clark	200	2531	not listed	Br. House 1150	8150	
1847	William C. Clark	50	8717	Not listed		2000	
1847	William C. Clark Twin Twp	100	4771	not listed	New Fr House 375	1575	First year Twin Twp checked
1847	William C. Clark Twin Twp	25	635	not listed		375	
	William C. Clark Twin Twp. $9561, high for the area						
	1848 William C. Clark dies, leaving land to his wife and daughters						
1850	William C. Clark Hrs (Heirs)	200	2531	not listed	Br. House 1150	8150	Hrs=Heirs
1850	William C. Clark Hrs	50	8717	not listed		2000	
1850	William C. Clark Hrs Twin Twp	100	4771	not listed	Fr. House 375	1575	
1850	William C. Clark Hrs Twin Twp	7	2460	not listed		250	
1859	William C. Clark Hrs	200	2531	not listed	Br. House 1000	9000	
1859	William C. Clark Hrs	50	8717	not listed		2250	
1859	William C. Clark Hrs Twin Twp.	7	2460	not listed		175	
	Between 1850 and 1861 Clark Heirs Sold House in Twin Twp						
1861	William C. Clark Hrs	200	2531	not listed	Br. House 1080	9720	
1861	William C. Clark Hrs	50	8717	not listed		2430	
1861	Wm C. Clark Hrs Twin Twp.	7	2460	not listed		190	
1863	Joanna Steele	200	2531	not listed	Br. House 1080	9720	
1863	Joanna Steele	50	8717	not listed		2430	
1863	George W. Steele Personal Property $1688 (No Joanna)						
	1863 Land officially in Joanna Steel's Name, no Clark heirs in Twin Twp list						
	Continued						

Appendix C. Real Estate Tax Records

Early county tax records provide information about owners of record as well as assessed value of real and personal property. Starting in 1826, those records begin specifically recording houses as well as acreage owned. Barns and outbuildings were not included in any of the tax records listed below.

	Owner (Union Twp unless otherwise noted)	**Acres**	**Original VMS**	**Land Value**	**House Description and Value**	**Total Value**	**Notes**
	Personal Property Listings: Horses, Cows, M (Money at Interest, Merchant Capital)						
EPISODE 2							
1867-68	Joanna Steele	200	2531	not listed	Br. House 1080	9720	
1867-68	Joanna Steele	50	8717	not listed		2430	
1869	Joanna Steele	200	2531	not listed	Br. House 1080	9720	
1869	Joanna Steele	50	8717 /8662	not listed		2430	
1870	Joanna Steele	200	2531	not listed	Br. House 1080	9720	
1870	Joanna Steele	50	8662/ 8717	not listed		2430	
1871	Joanna Steele	200	2531	not listed		linked to 50 ac.	
1871	Joanna Steele	50	8662/ 8717	not listed	1500	17415	
1875	Joanna Steele	200	2531	not listed		linked to 50ac	
1875	Joanna Steele	50	8662/ 8717	not listed	not listed	17412	
1875	Johanna [sic] C. Steele Personal Property $2435 no categories listed						
1882	Joanna Steele	200	2531	not listed	900	10760	
1882	Joanna Steele	50	8662/ 8717	not listed		2470	
1882	Johanna [sic] C. Steele Personal Property 2 Dogs $650						
1887	Joanna Steele	196	2531	not listed	900	10560	
1887	Joanna Steele	50	8662/ 8717	not listed		2470	
1887	Mrs, J.S. Steele Personal Property 1 Dog $2105						



Carson-Steel Barn, looking west. (STRATA 2023)

D TREATMENT WORKSHOP

Workshop Agenda
Carson-Steel (Scribe Rule) Barn Historic Structure Report
Hopewell Culture National Historical Park
Chillicothe, Ohio
PMIS 314612

Wednesday, June 26, 2024
8:30 – 2:30 – Hybrid - Online & at Hopewell Culture National Historical Park, Chillicothe, OH.

Morning -

- Welcome –
  - Greetings and Introductions
  - Lunch Break Discussion
- Workshop Focus
- Site Orientation
- Work to Date
- Existing Conditions
- Goals of the Historic Structure Report
- Project Factors
- Site History
  - Period of Significance
  - Scribe Rule and Square Rule
  - Timeline of Historical Events
  - Character Defining Features
  - National Register Eligibility
- Mission Statement - Hopewell Culture National Historical Park
- No Action
- Treatment Alternative #1: Stabilization and Basic Maintenance (Mothballing)
- Rehabilitation Discussion
- Treatment Alternative #2: Rehabilitation of Existing Barn for Park Use
- Treatment Alternative #3: Rehabilitation of Existing Barn for Visitor Use
- Treatment Alternative #4: Historic Use / Leasing
- Treatment Alternative #5: Sell / Surplus Barn Structure
- Treatment Alternative #6: Demolish Barn

Break –

Afternoon –

- Refine Treatment Alternatives - Discuss Additional Potential Treatment Alternatives
- Select NPS Preferred Treatment
- Further Considerations
- Thank You!

THESE WORKSHOP SLIDES CONTAIN NOTES TAKEN DURING THE WORKSHOP



Carson-Steel Barn
Treatment Alternatives Workshop

June 26, 2024

Welcome to the Treatment Alternatives Workshop

INTRODUCTIONS

WORKSHOP AGENDA

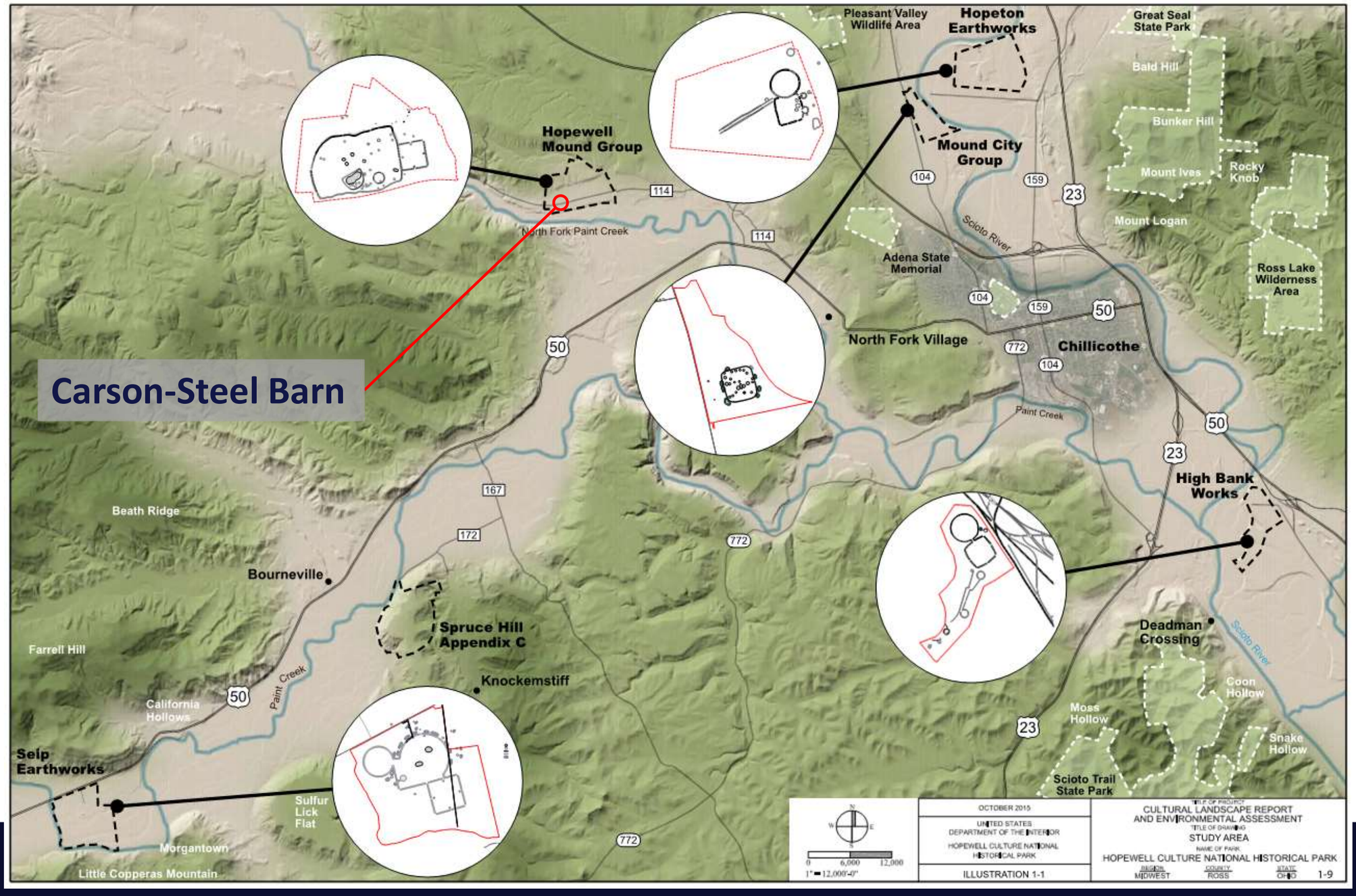
HOUSEKEEPING

WORKSHOP FOCUS



Workshop Introduction

Carson-Steel Barn Workshop
June 2024

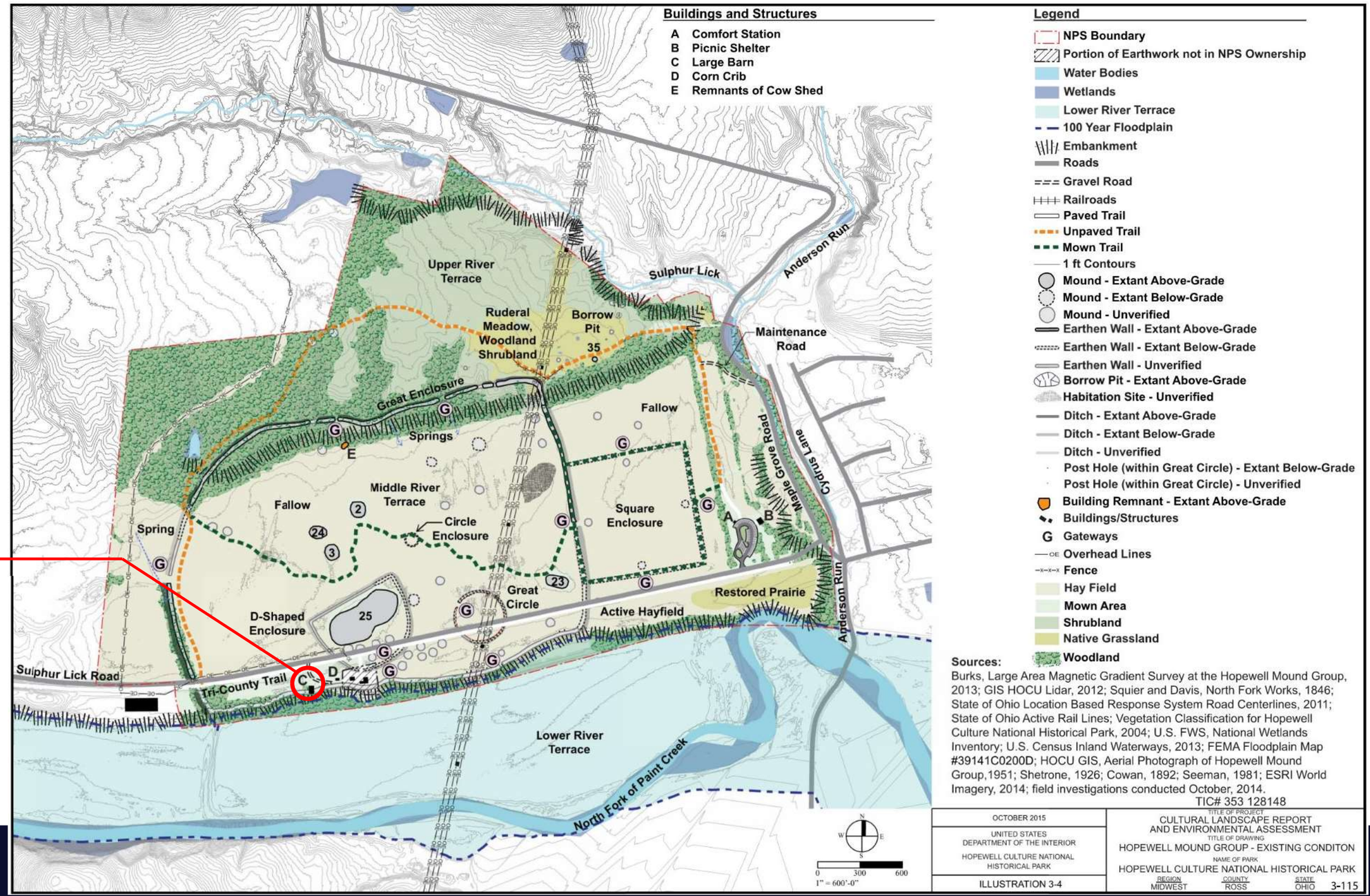


Park Map

Carson-Steel Barn Workshop
June 2024

Site Map from Cultural Landscape Report, 2016

Carson-Steel Barn



Site Plan

Carson-Steel Barn Workshop
June 2024

Existing Site Plan from Cultural Landscape Report, 2016

Approximate location of the Carson-Steel Barn

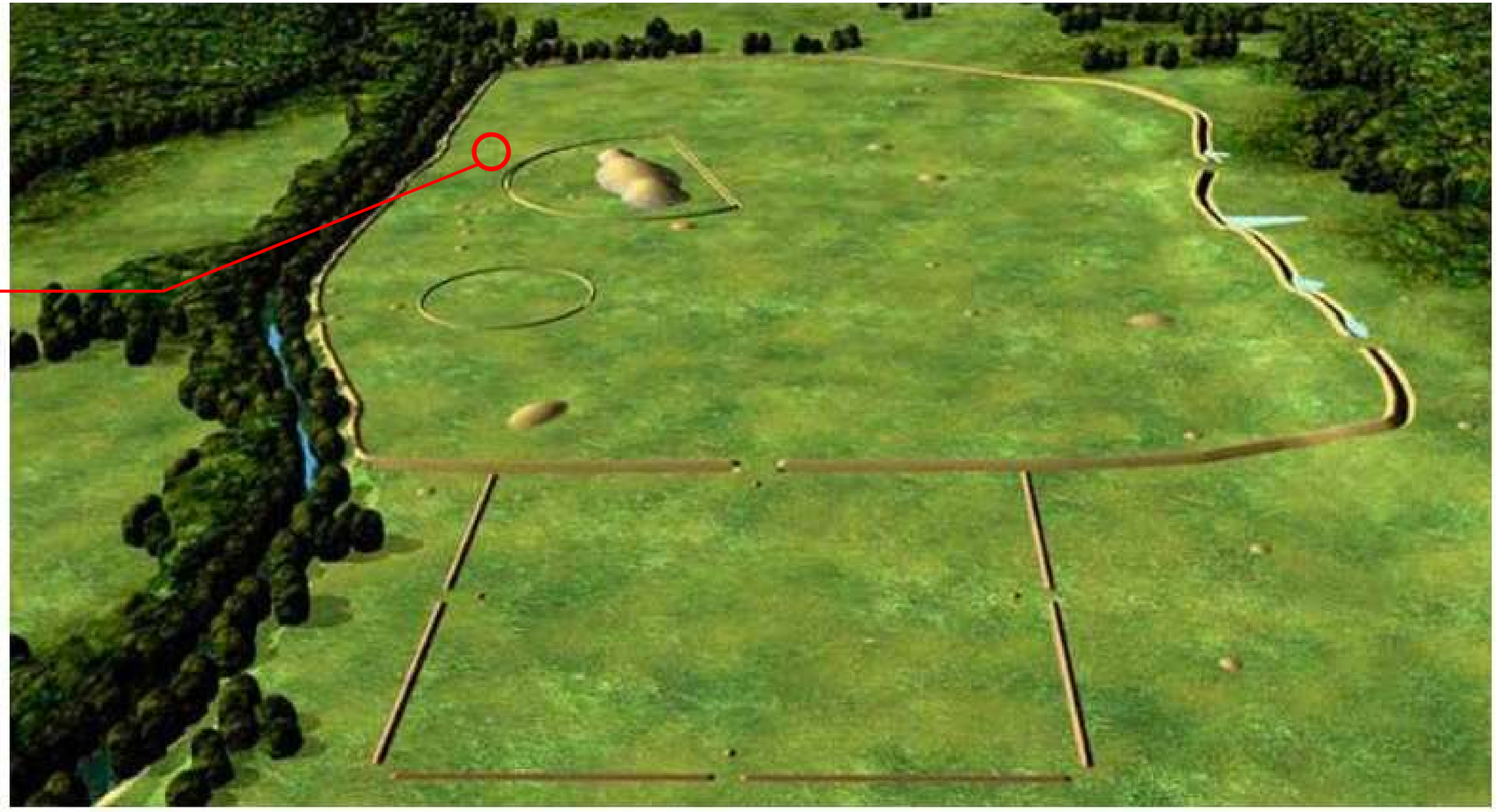
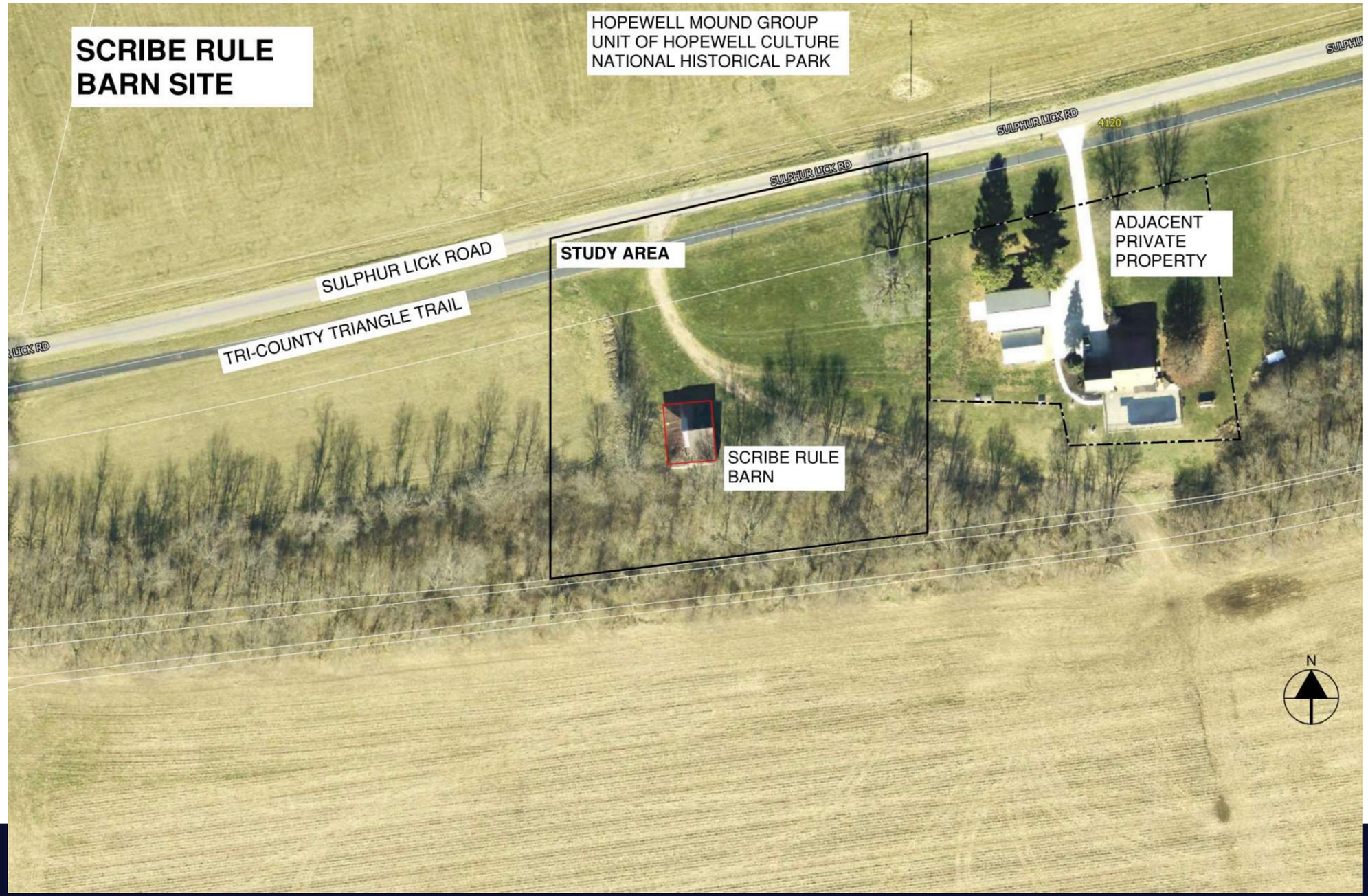


Figure 3-12. Archaeologists have estimated that the walls of the Great Enclosure at Hopewell Mound Group were originally 35 feet wide at the base, and enclosed an area of 111 acres. The largest known mound built by the Hopewell Culture is at Hopewell Mound Group. (Digital reconstruction courtesy Center for the Electronic Reconstruction of Historical and Archaeological Sites, University of Cincinnati)

Site Render

Carson-Steel Barn Workshop
June 2024

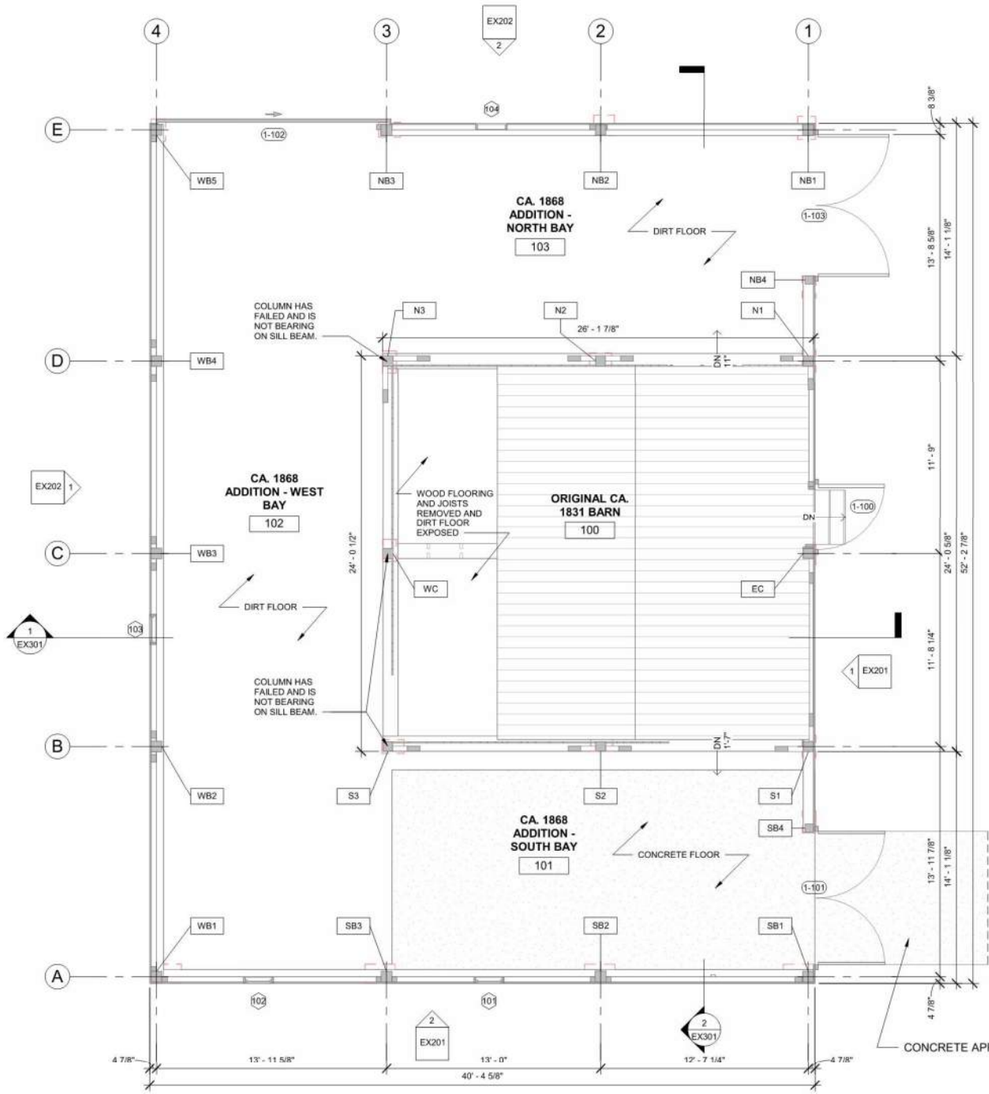
Aerial Site Render from Cultural Landscape Report, 2016



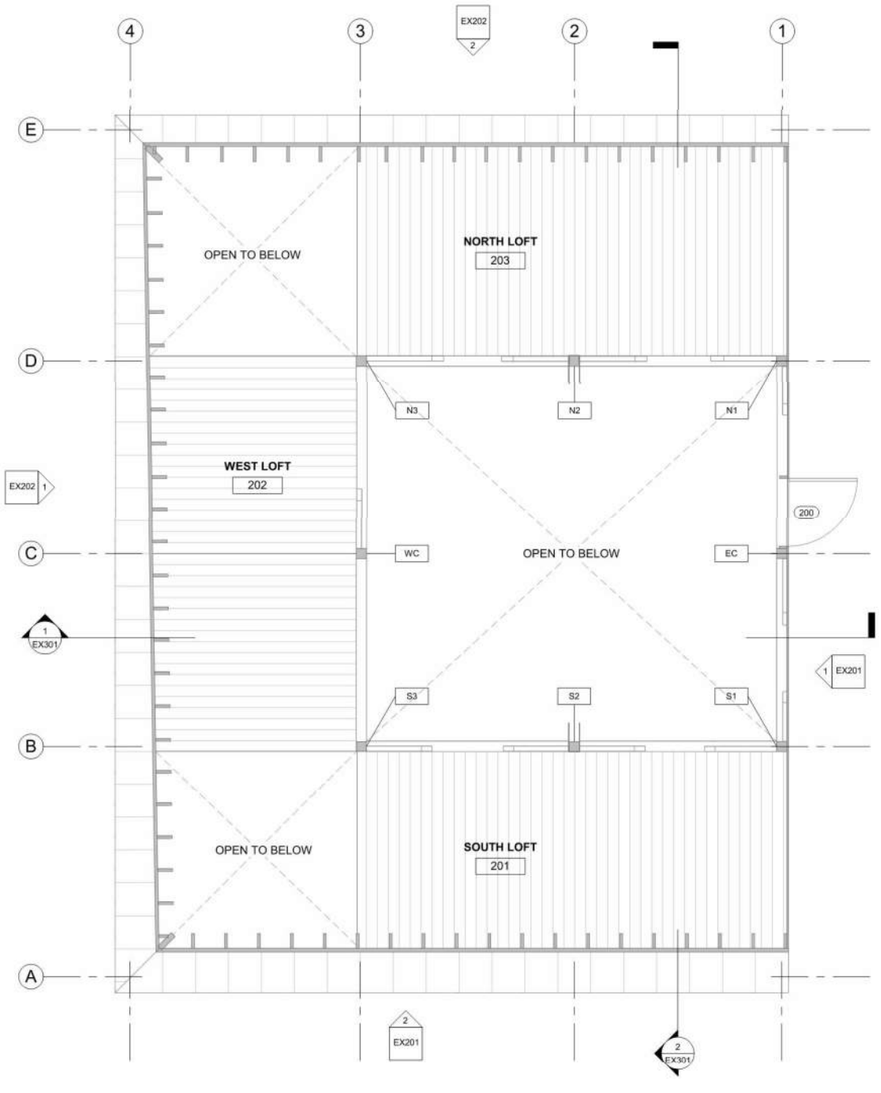
Site Plan

Carson-Steel Barn Workshop
June 2024

STRATA, 2024



1 EX101 Level 1 Existing Floor Plan
1/4" = 1'-0"



2 EX101 Level 2 Existing Floor Plan
1/4" = 1'-0"

Floor Plans

Carson-Steel Barn Workshop
June 2024

Work to Date

- On-site
- Dendrochronology
- Timber framing Workshop
- Determination of Eligibility
- 70% Working Draft

Architectural – STRATA Preservation Inc.

Angie Gaebler, Historical Architect and Contract Manager

Zevi Aronstein, Historical Architectural Designer

Natalie Anderson, Historical Architectural Designer

Structural – Silman

Jenna Bresler, Preservation Engineer

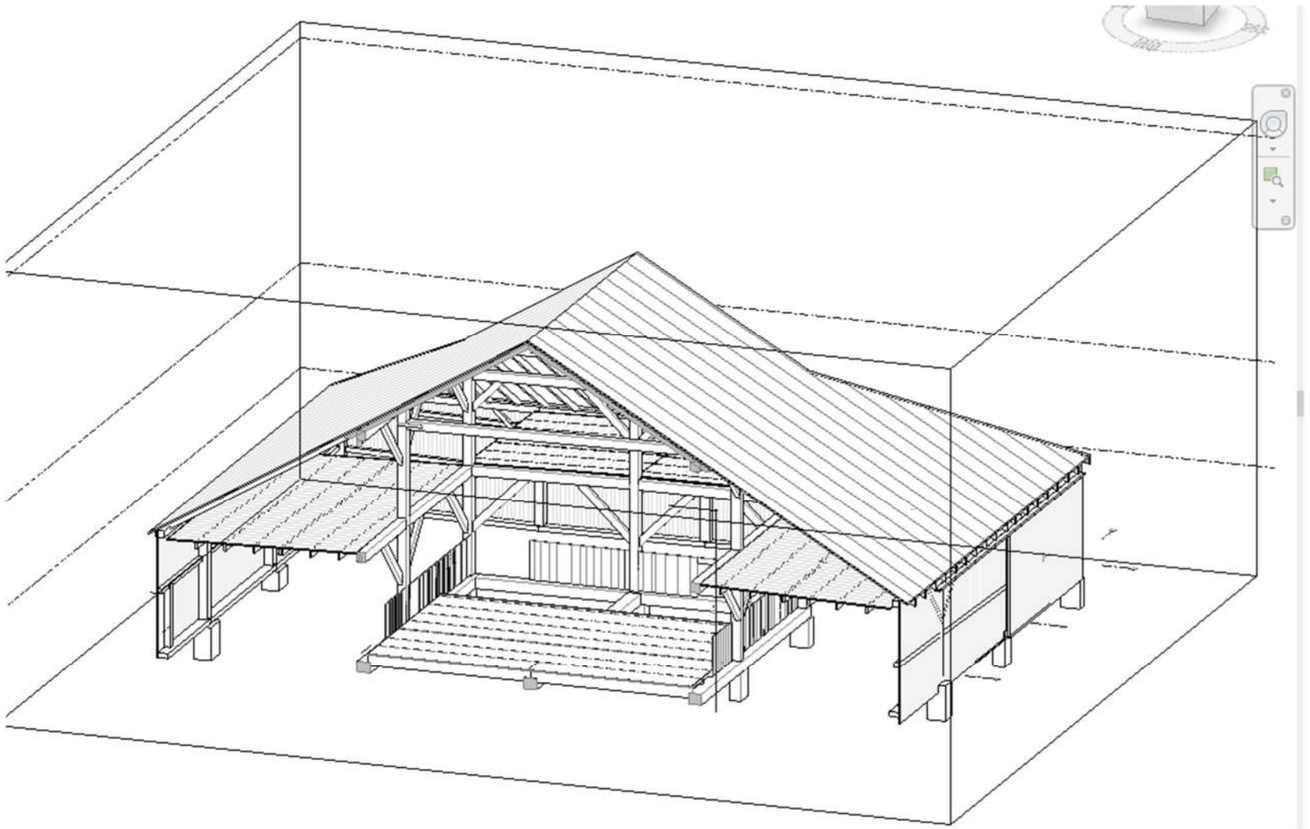
Architectural Historian – Building Preservation

Debbie Sheals, Architectural Historian



THE MATTERPORT SURVEY

https://my.matterport.com/show/?m=3hEtytsQVvq



Work to Date

Carson-Steel Barn Workshop
June 2024











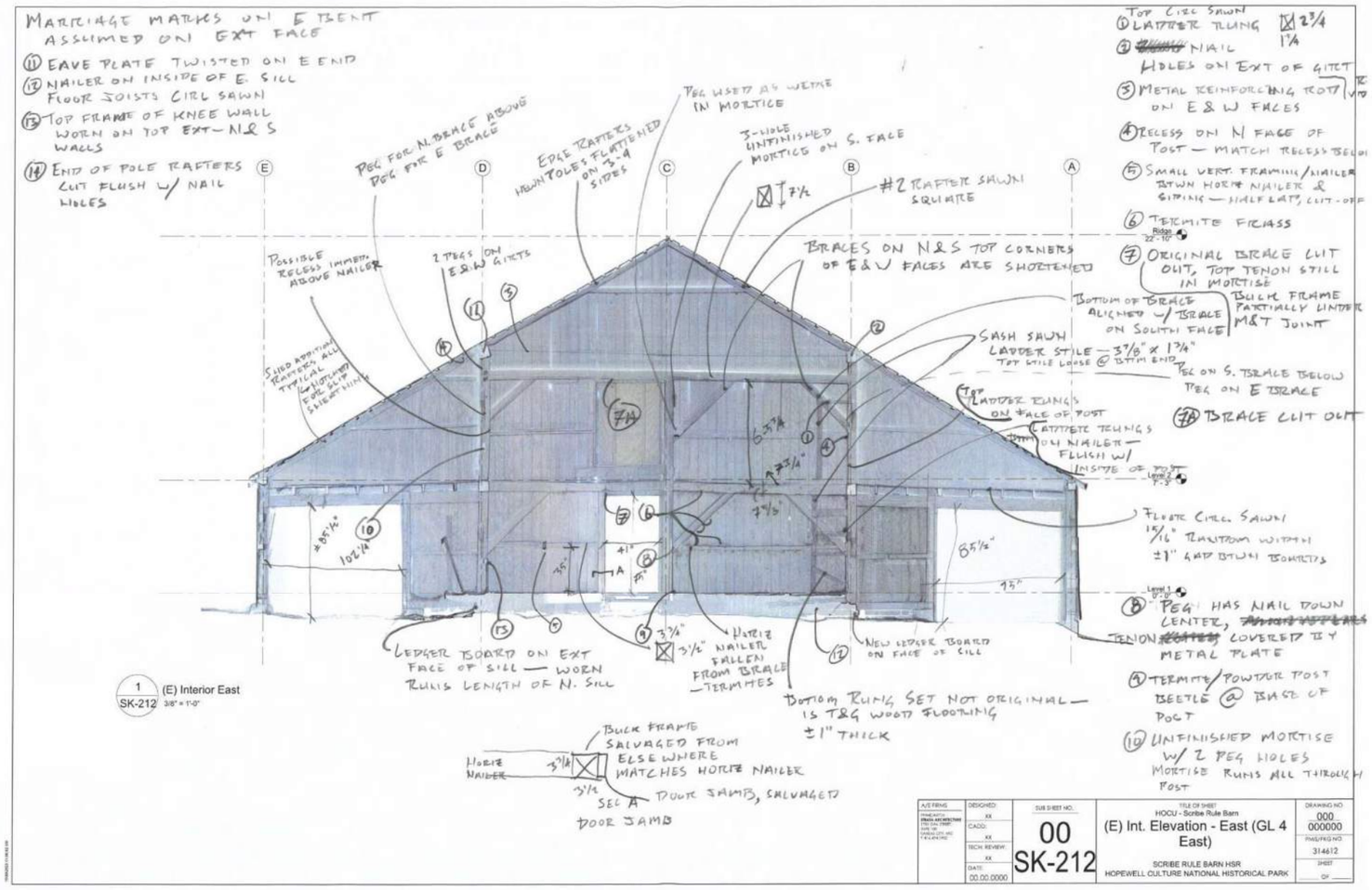


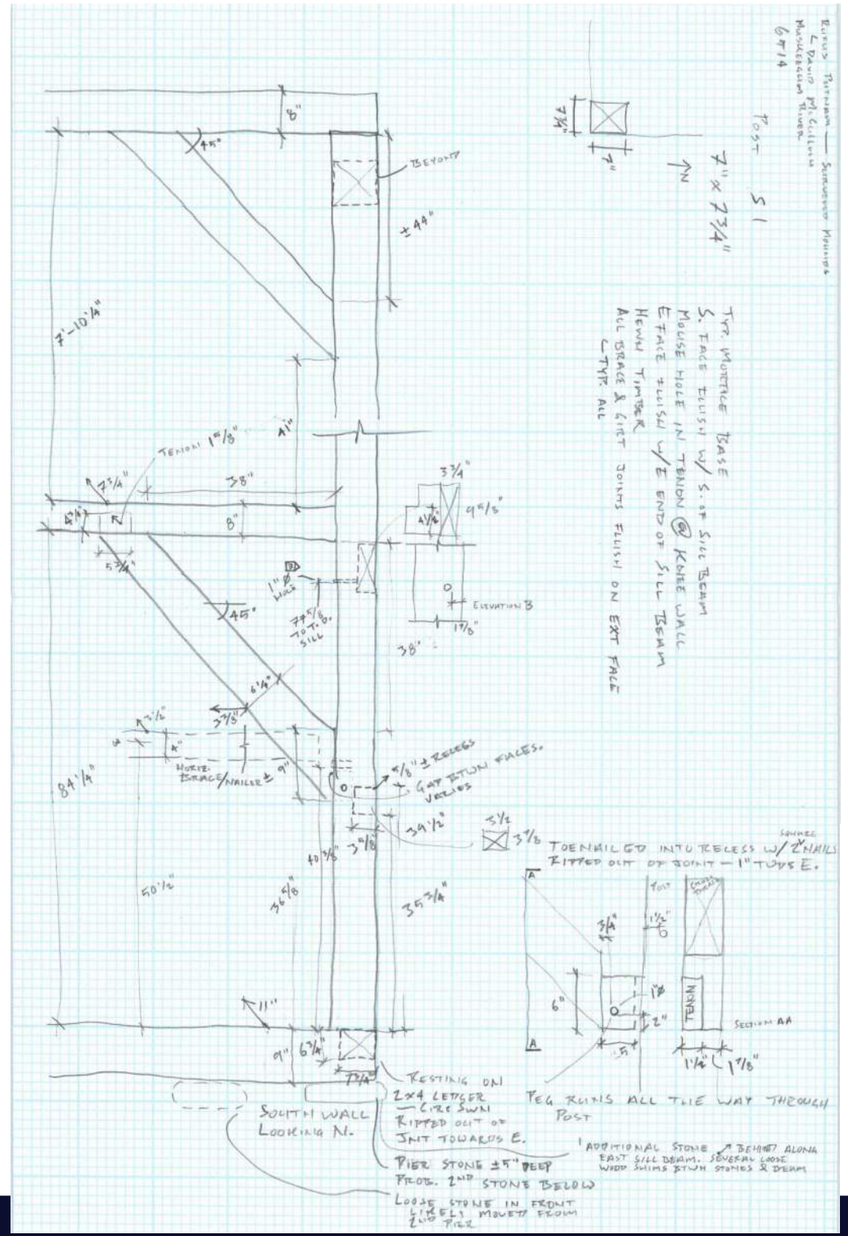




Site Visit: October 2023

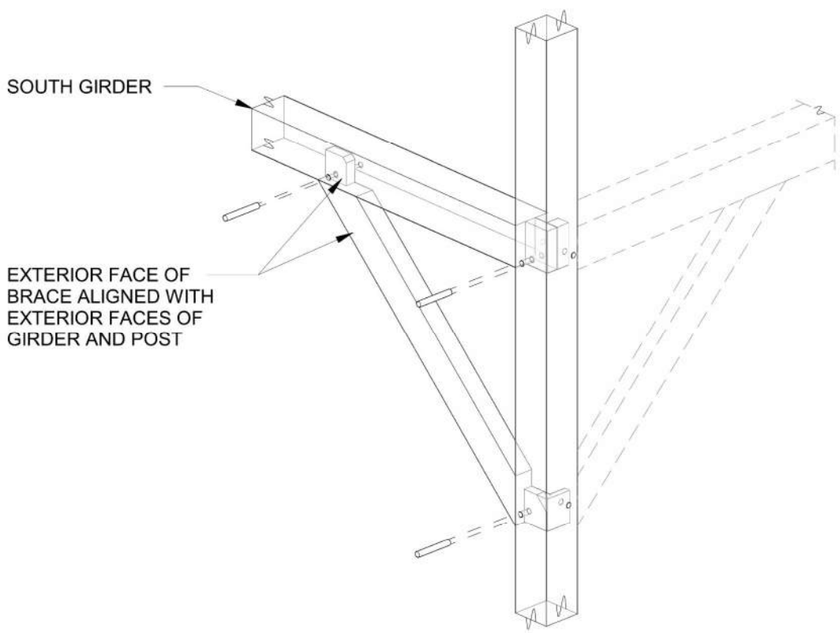
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Site Visit: October 2023

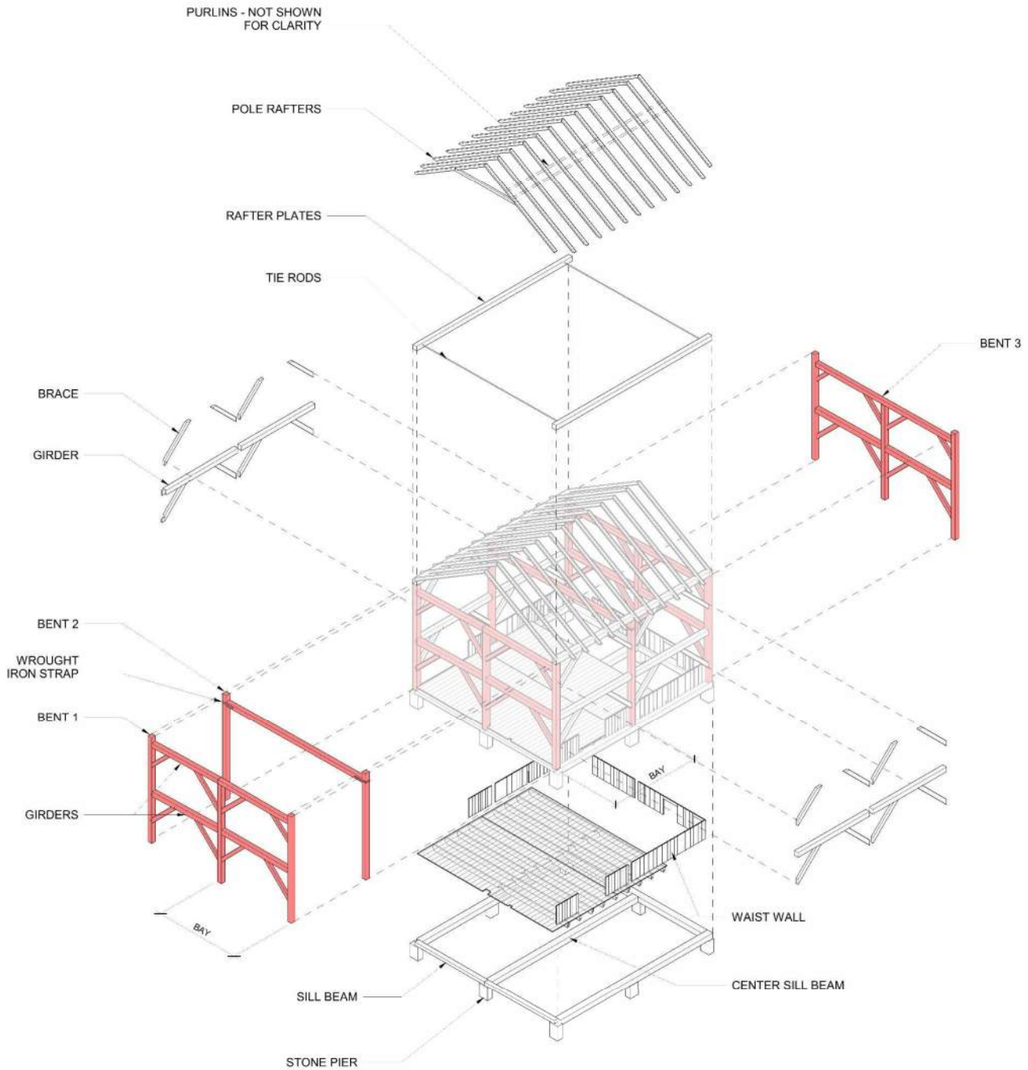
Carson-Steel Barn Workshop
June 2024



S1 - SOUTHEAST CORNER POST AND BRACE DETAIL

NORTH

Timber Framing Terminology & Detail



Terminology Diagram

NORTH

Terminology Diagrams

Carson-Steel Barn Workshop
June 2024

CONDITIONS:

The Carson-Steel Barn is varied in its overall condition. Some historic framing of the barn are in good structural condition, while other sections have completely failed. Without intervention soon, the structure will continue to fail and will not be repairable.

- *Structural Failure is due to*
  - *Previous storm damage (twice) with sections of missing roofing*
  - *Leaking roof/flashings allowing water to infiltrate*
  - *Pests below the finished first floor piling dirt along the wood framing*
  - *Settlement of the stone piers*
  - *Pests that have infested certain sections of the wood structure (powder post beetles, carpenter bees, termites, and rodents) – these do not seem to be currently active.*
  - *Deterioration of siding exposing structural elements to weather*
  - *Settlement of interior concrete floor (south addition bay)*

CONDITIONS:

- *Structural Failure includes*
  - *Deteriorated sill beams (south and west)*
  - *Buckled posts (west)*
  - *Deteriorated posts (west and south)*
  - *Missing post (west addition)*
  - *Deteriorated first floor structure (center)*
  - *Deteriorated rafter plates*
  - *Deteriorated rafters ends*
  - *Deteriorated and missing rafters from storm damage*
  - *Deteriorated loft framing and supports*



THE GOALS OF THE HISTORIC STRUCTURES REPORT FOR THE CARSON-STEEL BARN ARE AS FOLLOWS:

1. *Document the Historical Background and Context;*
2. *Record the Chronology of Development and Use;*
3. *Identify Character-Defining Features;*
4. *Provide Documentation and Physical Description;*
5. *Provide a Conditions Assessment;*
6. *Develop a Treatment Plan, including alternatives;*
7. *Determination of Eligibility and NR Nomination.*

PROJECT FACTORS:

1. *NR Eligibility*
2. *UNESCO World Heritage Site Designation*
3. *CLR Treatment Recommendations*
4. *Preserve Original Material*
5. *Preserve Context*
6. *Potential Compatible Uses*
7. *Repair / Rehab Costs and Long-Term Maintenance*
8. *Staffing Requirements*
9. *Secretary of the Interior's Standards for the Treatment of Historic Properties*
10. Visitor & Park Staff Safety
11. Community / Public opinion
12. If the building falls over, significantly larger hazmat contamination area--and archaeological impact thereof

Park interpretation approach has shifted based on approach from Tribal Partners. Updating the CLR to reflect this could be done, but would require a significant undertaking

4. Examine preservation / interpretation of original material outside original context--at visitor center, etc.
6. Maintenance is not a highly compatible use, but visitor use is not compatible with the site
7. Rehab options include significant design, rehab, maintenance costs
8. Visitor use would increase staffing needs

Project Factors

Carson-Steel Barn Workshop
June 2024

SUMMARY OF TREATMENT RECOMMENDATIONS

Treatment Alternative 1 (Not Preferred):

- Non-contributing features, including the Carson-Steel Barn, can be used in interpretation of the early archaeological investigation of the earthworks.

Preferred Treatment of Buildings & Structures:

- At Hopewell Mound Group, rehabilitation emphasizes revealing the spatial qualities of the Great Enclosure. Existing large-scale intrusions, including utilities, structures, and other non-contributing features that do not reflect the Hopewellian earthwork complex will be removed and/or relocated.
- Long-term treatment recommendations are to remove all buildings and structures from the earthwork complex, in order to protect the setting of the archeological landscape.
    - The park will work with property owners to develop a long-term plan to remove buildings that impact the earthwork

2016 CULTURAL LANDSCAPE REPORT

HOPEWELL MOUND GROUP TREATMENT ALTERNATIVES

PREFERRED TREATMENT



Carson-Steel Barn Workshop
June 2024

Choosing an Appropriate Treatment for the Historic Property

The Guidelines are intended to promote responsible preservation practices that help protect the nation's irreplaceable cultural resources. But, once a treatment is selected, the Standards and Guidelines provide a consistent philosophical approach to the work.

Choosing the most appropriate treatment for a building requires careful decision making about a building's historical significance, as well as taking into account a number of other considerations:

- Level of Significance. National Historic Landmarks, designated for their "exceptional significance in American history," and other properties important for their interpretive value may be candidates for Preservation or Restoration. Rehabilitation, however, is the most commonly used treatment for the majority of historic buildings Reconstruction has the most limited application because so few resources that are no longer extant can be documented to the degree necessary to accurately recreate the property in a manner that conveys its appearance at a particular point in history.
- Physical condition. Preservation may be appropriate if distinctive materials, features, and spaces are essentially intact and convey the building's historical significance. If the building requires more extensive repair and replacement, or if alterations or a new addition are necessary for a new use, then Rehabilitation is probably the most appropriate treatment.

SECRETARY OF THE INTERIOR STANDARDS

- Proposed use. Many historic buildings can be adapted for a new use or updated for a continuing use without seriously impacting their historic character. However, it may be very difficult or impossible to convert some special-use properties for new uses without major alterations, resulting in loss of historic character and even integrity.
- Code and other regulations. Regardless of the treatment, regulatory requirements must be addressed. But without a sensitive design approach such work may damage a building's historic materials and negatively impact its character. Therefore, because the ultimate use of the building determines what requirements will have to be met, some potential uses of a historic building may not be appropriate if the necessary modifications would not preserve the building's historic character. This includes adaptations to address natural hazards as well as sustainability.

Rehabilitation as a Treatment

Rehabilitation is defined as the act or process of making possible 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.

The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character.

SECRETARY OF THE INTERIOR STANDARDS

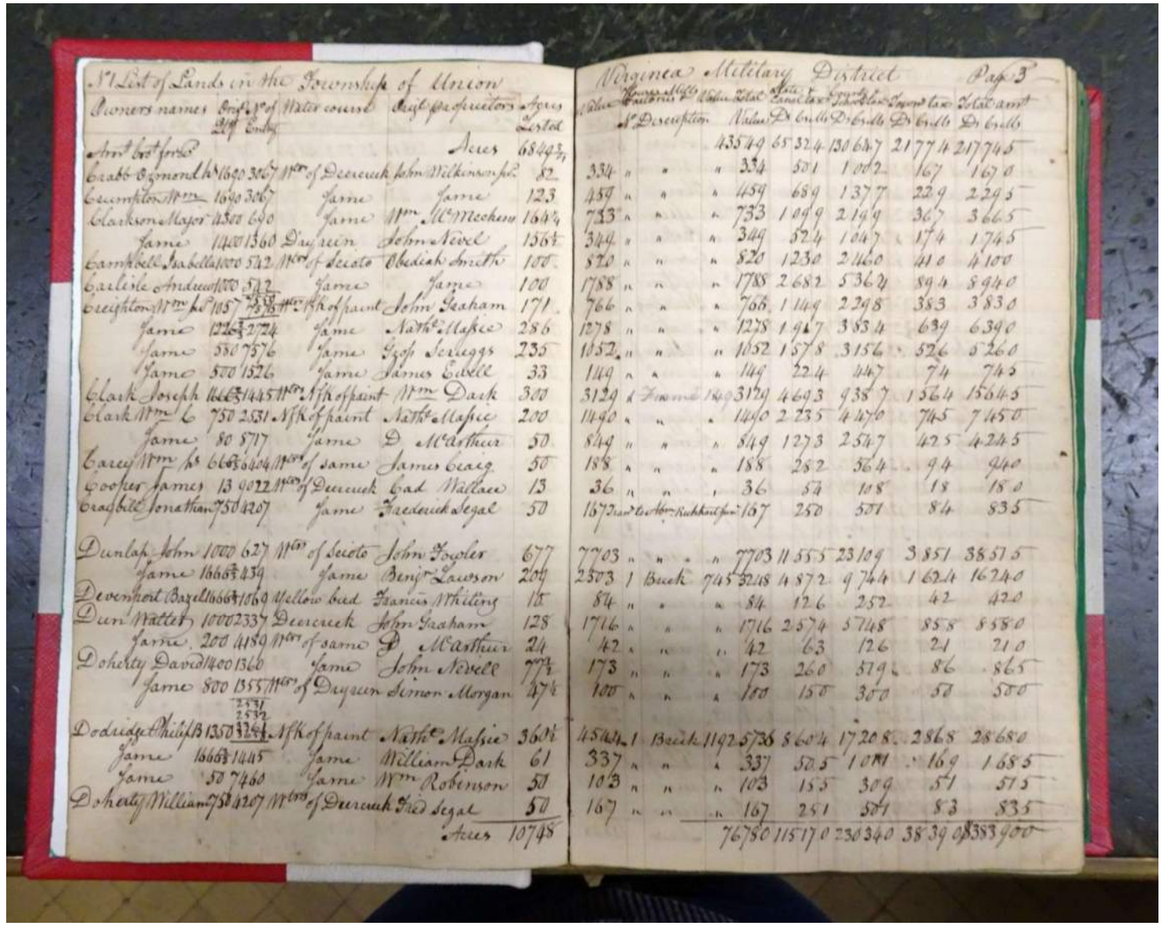
1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of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

SOI Standards for Rehabilitation

Carson-Steel Barn Workshop
June 2024

The barn was built in two phases. The period of significance begins ca. 1831, with construction of the first section, and ends ca. 1867 when the addition was complete. The barn has seen no significant additions or alterations since the 1860s.

- Dendrochronology identified likely construction dates for each section of the barn.
- Primary and secondary sources identified early owners and major periods of development (episodes).
- Primary sources included county records, period newspapers, census and genealogical records.



Historical Background and Context

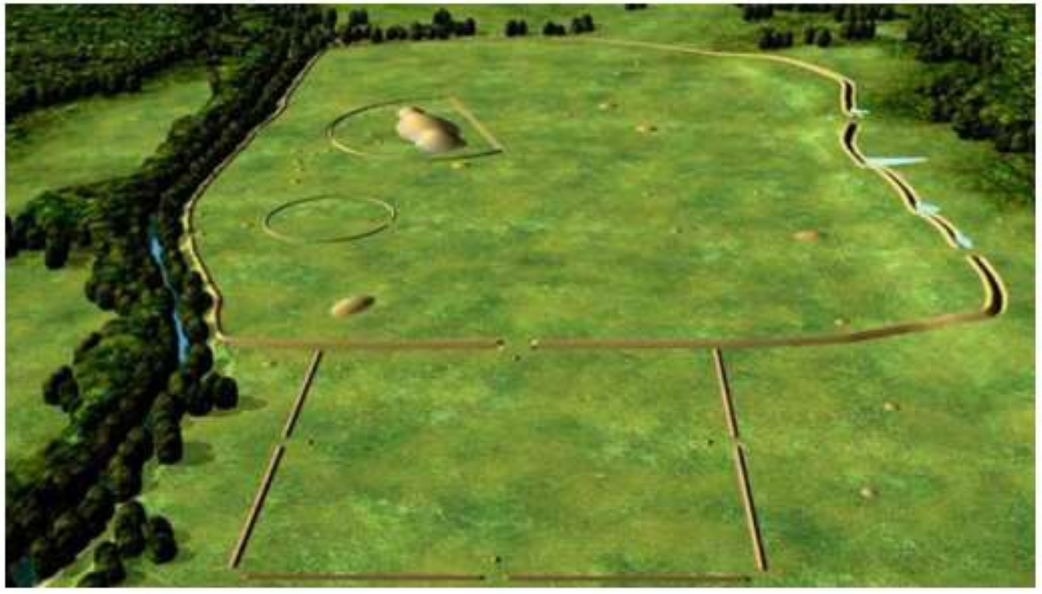
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Scribe Rule and Square Rule (Mortise and Tenon)

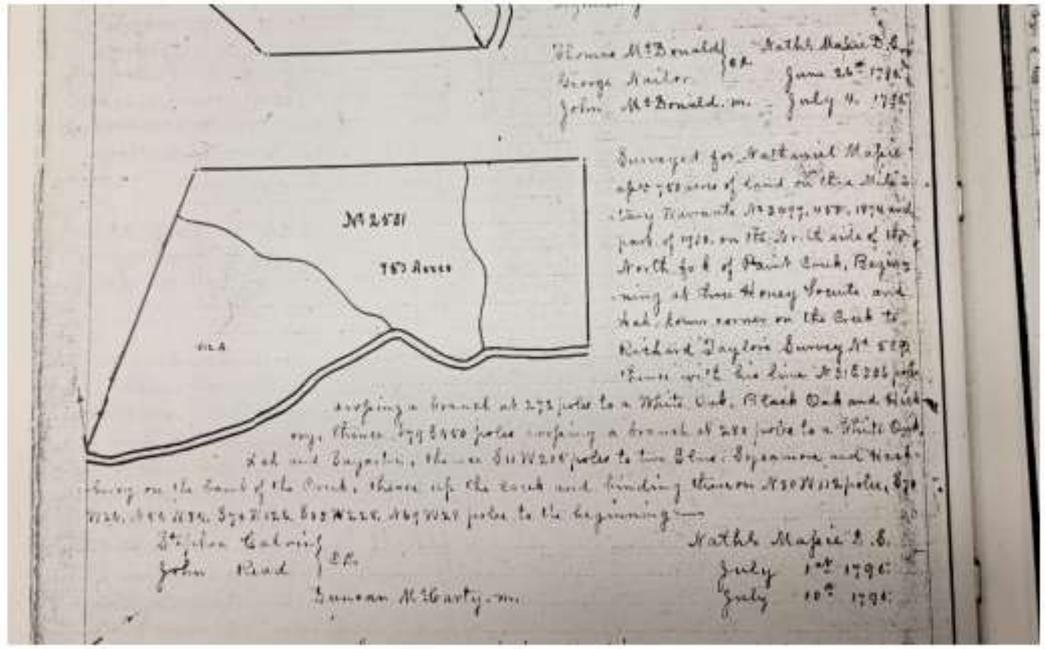
- The Scribe Rule method of timber framing, which required the services of at least one master carpenter, developed in England and Europe in the 1200s and was used in the American colonies and the United States into the first half of the 1800s.
- The less technical Square Rule method developed in the United States around 1800, and by the mid-1800s, it had almost completely replaced Scribe Rule.
- The Carson-Steel barn was built during that transitional period, and it provides a good example of both framing techniques.



PRECONSTRUCTION







Hopewell Culture active in the area.
1 CE - 400 CE

Indigenous cultures, including Intrusive Mound People and the Fort Ancient culture, occupied the area until it was depopulated for unknown reasons around 1450.
400 CE - 1450 CE

Shawnee, Delaware, Miami, and Wyandotte tribes were in the area when first white settlers arrived.
1650

Nathaniel Massie began surveying land in the Virginia Military District, which was established in 1784.
1788

Nathaniel Massie registers a survey of Virginia Military District tract 2531, which includes the Carson-Steel Barn lot.
1795

Joseph and Sarah Darlington buy a 400-acre parcel from Massie. Most of that land was in VMD 2531; an area close to the creek (south of the barn) was in VMD 8728.
1798

Jeremiah Ashby (sometimes spelled Ashbee) purchased the 400-acre parcel from the Darlingtons for $4,000 ($10 per acre).
1814

"Record of Jeremiah Ashby's Survey," Map made by the Ross County Surveyor in 1818 is the oldest known map of the barn property.
1818

Period of Significance

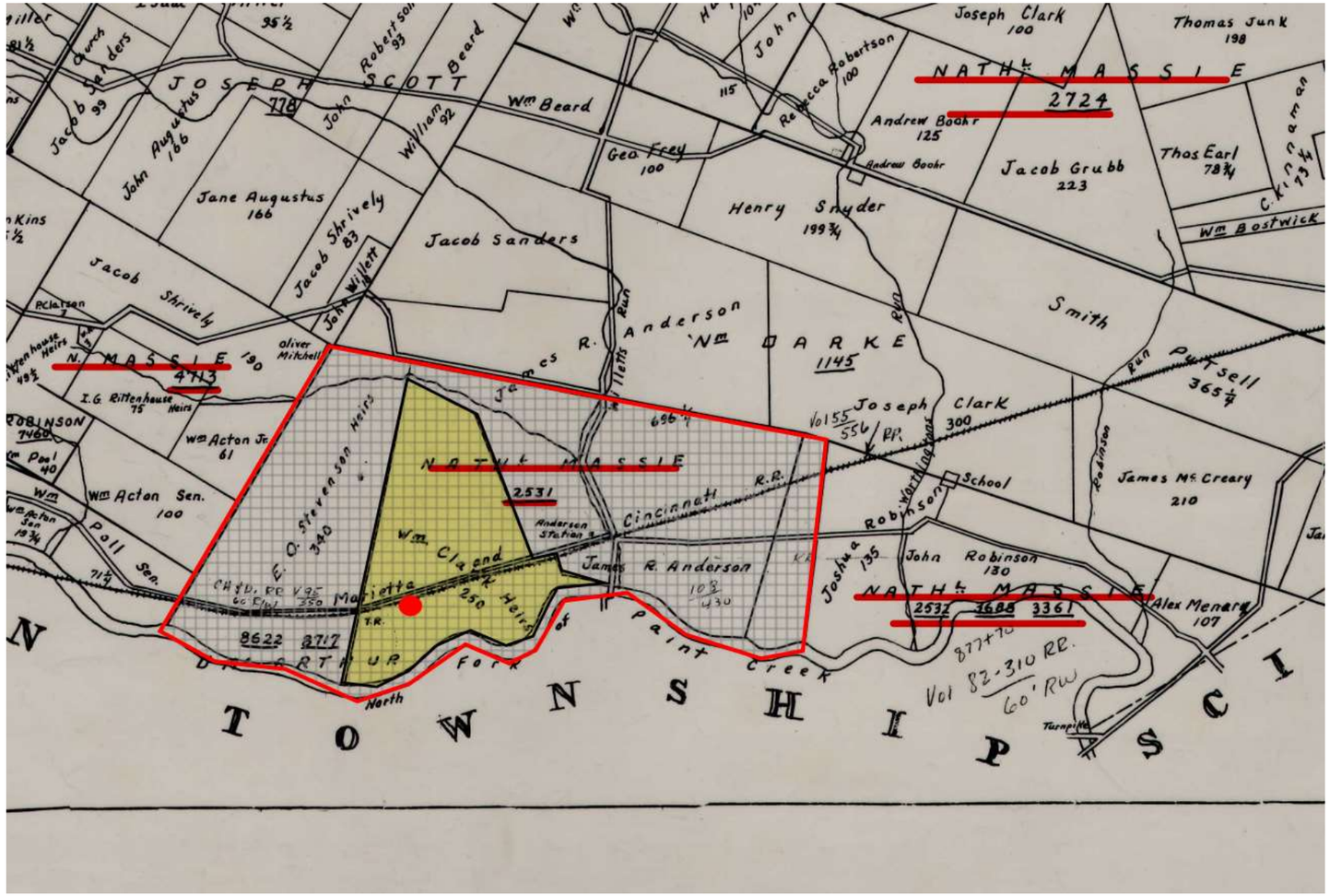
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June 2024





GENERAL NATHANIEL MASSIE.

FOUNDER OF CHILLICOTHE.

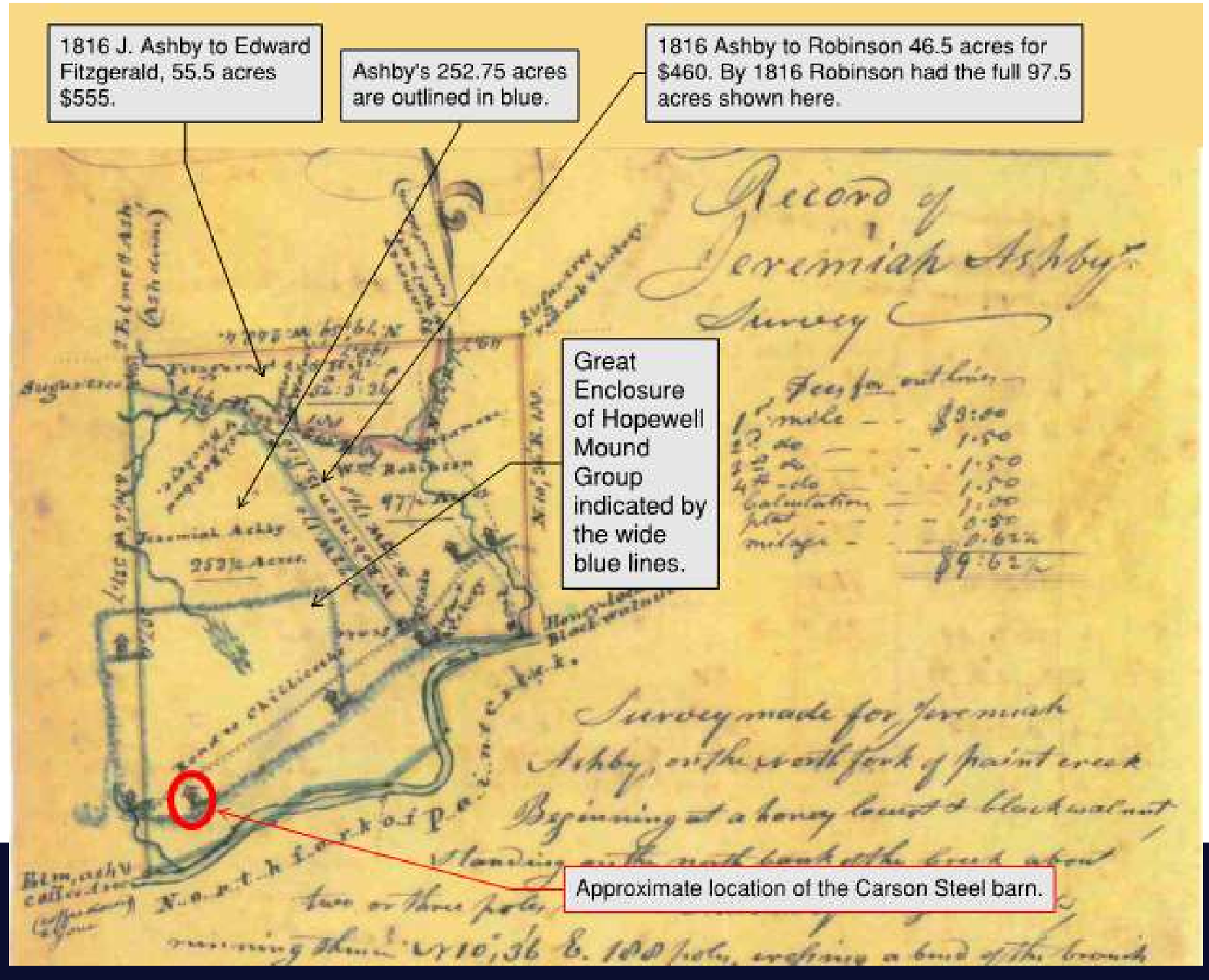


Early Land Ownership

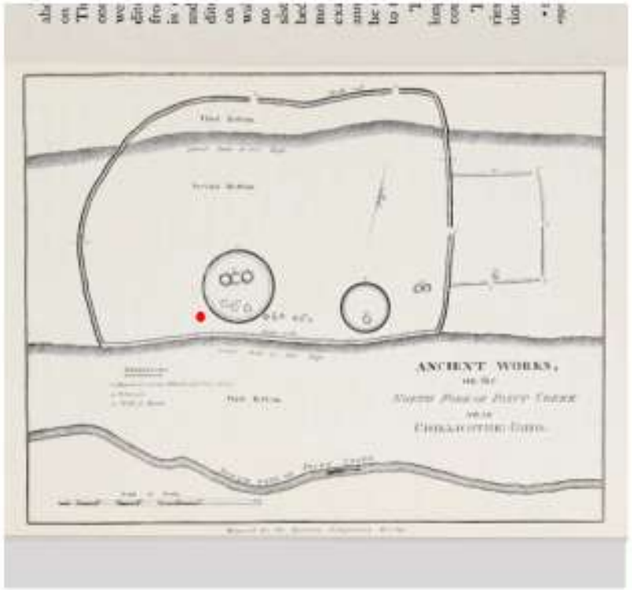
Carson-Steel Barn Workshop
June 2024

- Nathaniel Massie- 750 acres
- Jos Darlington- 400 acres
- Jeremiah Ashby- 400 acres
- William Carson- 250 acres

Only Ashby appears to have ever lived on the property.



PRECONSTRUCTION

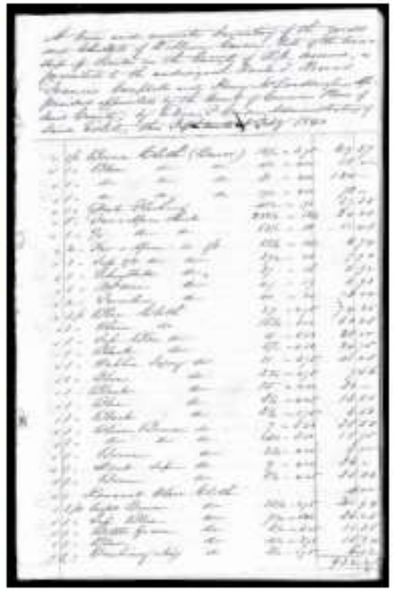


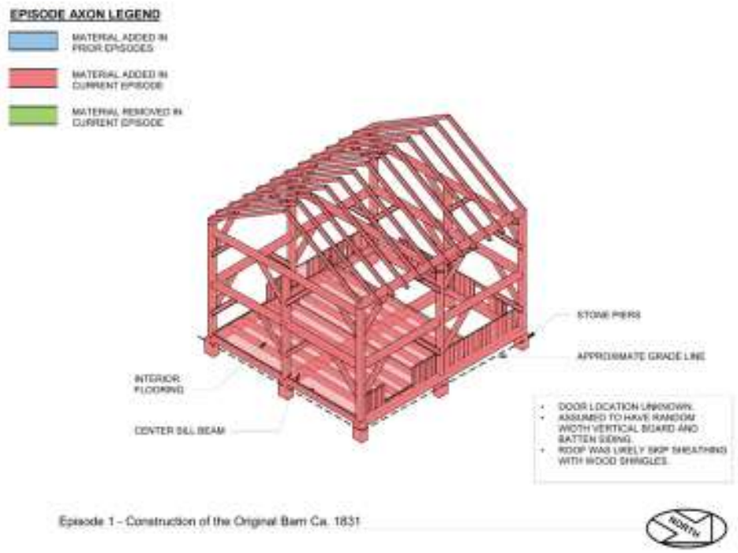
EPISODE 1. CONSTRUCTION OF THE ORIGINAL BARN: CA. 1829-1867











1820 — First available Ross County real estate tax records show Jeremiah Ashby owns 250 acres and his son Daniel Ashby owns 55-1/2. Neither was assessed for house.

1820 — Archeologist Caleb Atwater visits the site and makes one of the first known maps of the earthworks.

1829 — Jeremiah Ashby sells Wm. Carson 200 acres that included the barn site.

1830 — Real estate tax records still show Jeremiah and Daniel Ashby as owners of land in VMD 2531, through 1830.

1830 — Census: William Carson was living in Chillicothe, apparently with his family.

Ca. 1831 — First section of the barn was constructed by or for William Carson. Trees for the barn were felled in 1830, per dendrochronology.

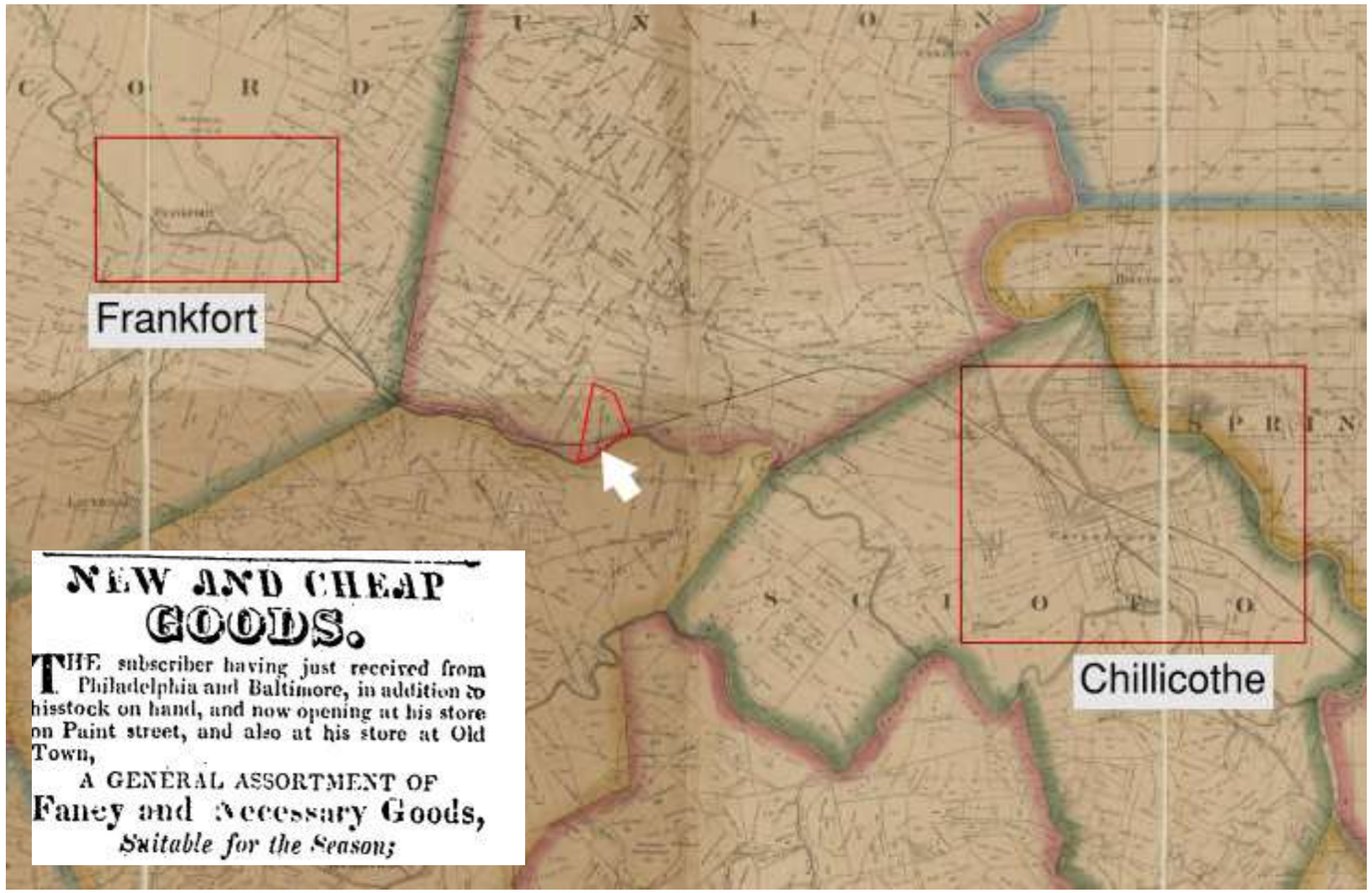
1833 — William Carson sold William C. Clark 250 acres for $3,200. This included Daniel Ashby's 50-acre parcel. Increased value likely reflects the construction of the Scribe Rule Barn and other improvements made by Carson.

1840 — William Carson died after a buggy accident that occured while he was driving between Chillicothe and Frankfort. Probate records show he owned large stocks of cloth, clothing, and household goods, but nothing related to agriculture.

1841 — Real estate tax records show William C. Clark added a brick house to his 250-acre farm.

Period of Significance

Carson-Steel Barn Workshop
June 2024



Episode 1 – Original Structure: 1829-1867

Core of current barn was built ca. 1831 for William Carson

William Carson does not appear to have lived on the farm.

- He had stores in Chillicothe and Frankfort (Old Town).
- The farm is mid-way between those towns.
- He was living in Chillicothe in 1830.
- He was living in Chillicothe at the time of his death in 1840

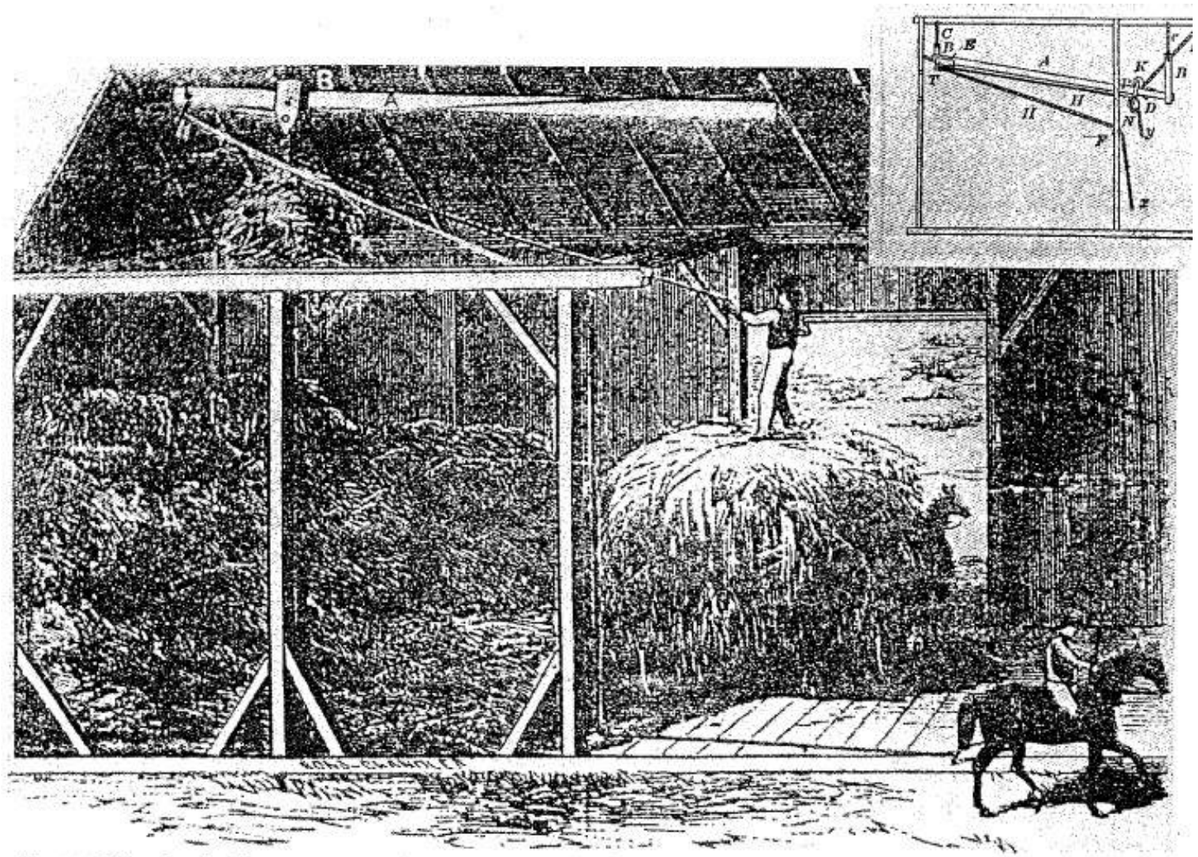
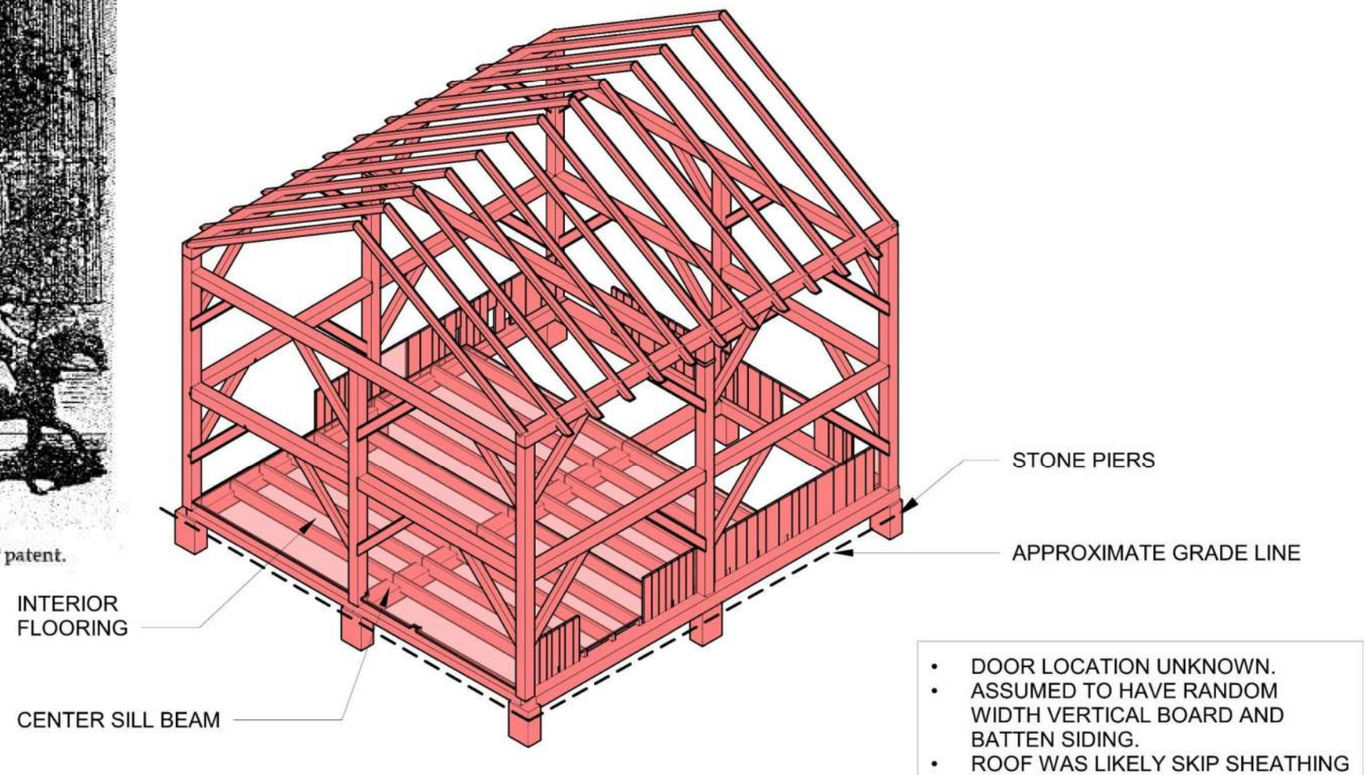


Fig. 5.1. William Louden's hay carrier at work in a barn. Inset at upper right shows Louden's 1867 drawing submitted for patent.
Source: *Prairie Farmer*, April 27, 1872

Historical Episode Diagram: ca. 1868

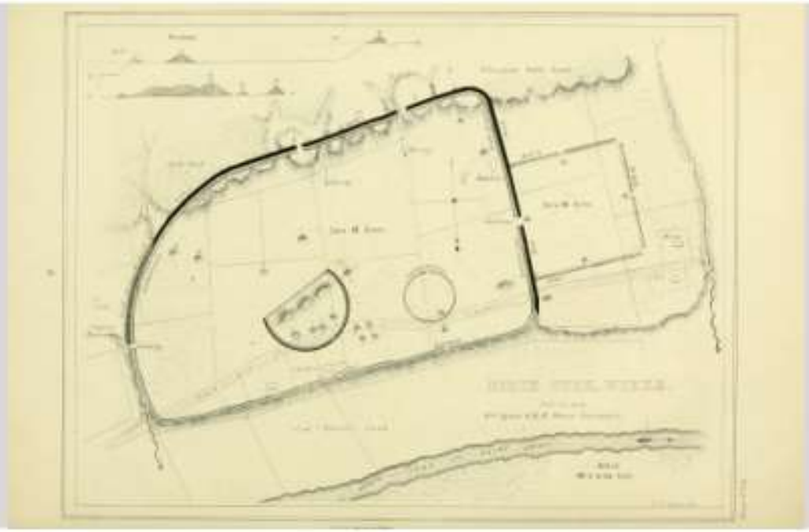


- DOOR LOCATION UNKNOWN.
- ASSUMED TO HAVE RANDOM WIDTH VERTICAL BOARD AND BATTEN SIDING.
- ROOF WAS LIKELY SKIP SHEATHING WITH WOOD SHINGLES.

Episode 1 - Construction of the Original Barn Ca. 1831

NORTH

EPISODE 1. CONSTRUCTION OF THE ORIGINAL BARN: CA. 1829-1867



Dr. Edwin Hamilton Davis and Ephraim Squier survey and map what is now the Hopewell Mound Group. The farmstead was labeled "Clark's" or "Clark's Gateway." The earthworks were labeled, "North Fork, Works," another early name for the site.

1845-46

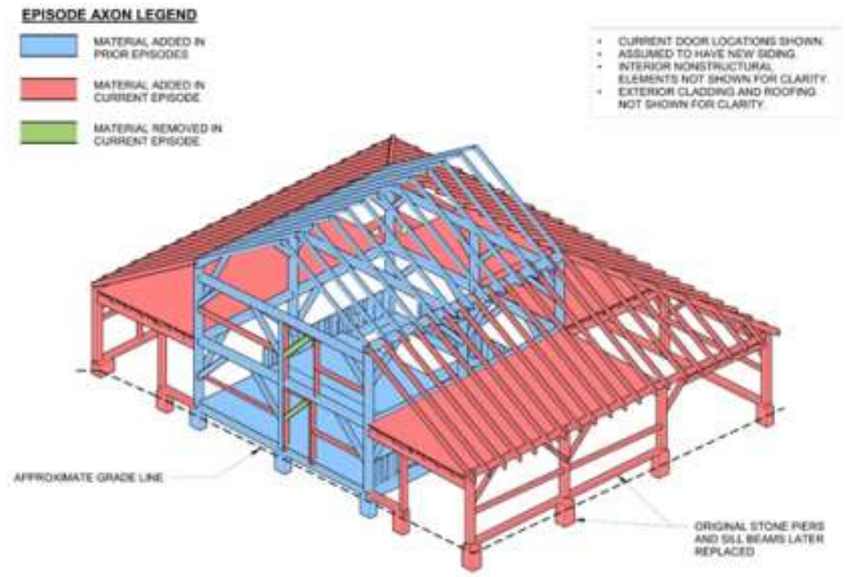
William C. Clark dies and his land passes to his wife, Sarah, and two daughters, Caroline and Joanna.

1848

Joanna C. Steel's husband, George W. Steel, dies. He appears to have been running the farm prior to his death.

1867

EPISODE 2. JOANNA C. STEEL: 1868-1889



The addition to the barn was built by or for Joanna Steel. The trees were felled in 1867, per dendrochronology.

Ca. 1868

Union Township Atlas labels the farm as belonging to Mrs. Joanna Steele [sic]. She is one just two women included in the business listings of that atlas—both were farmers.

1875

Joanna Steel's heirs sold land totaling 261 acres to Mordecai Cloud Hopewel for $16,000.

1889

Joanna Steel dies. Her estate included a framed copy of a survey of the farm.

1888

EPISODE 3. M.C. HOPEWELL: 1890-1973

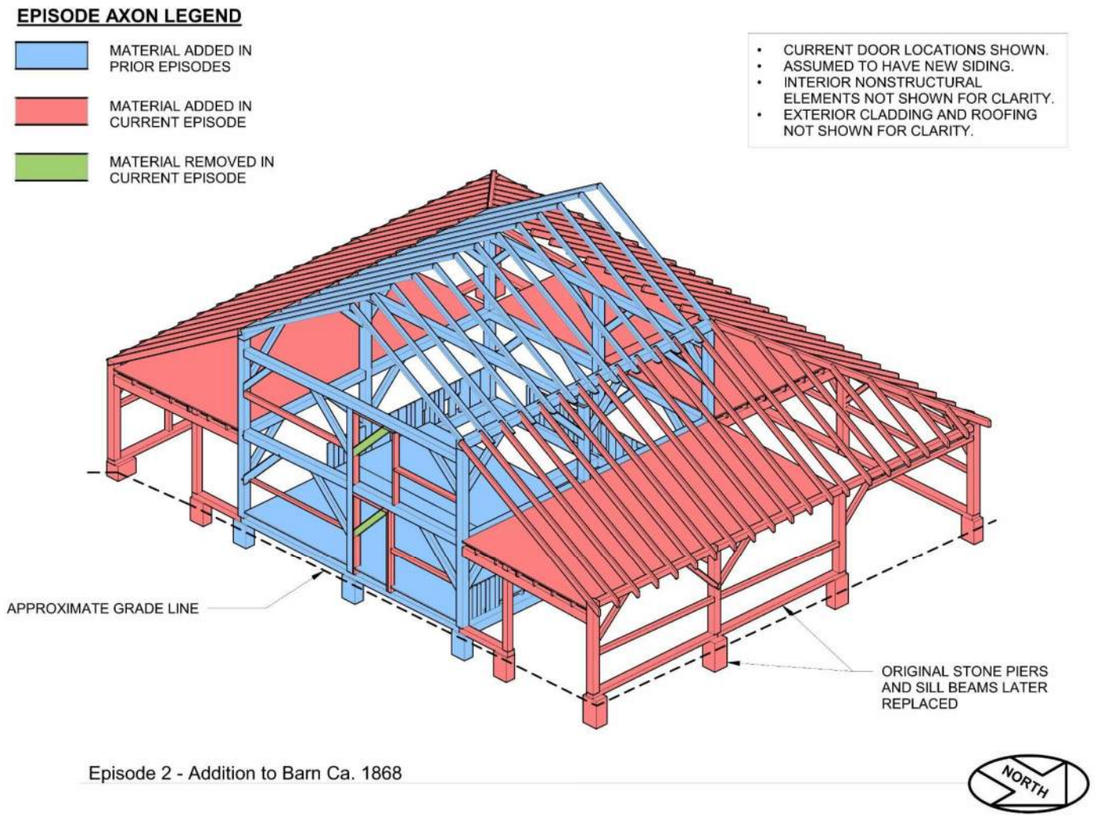


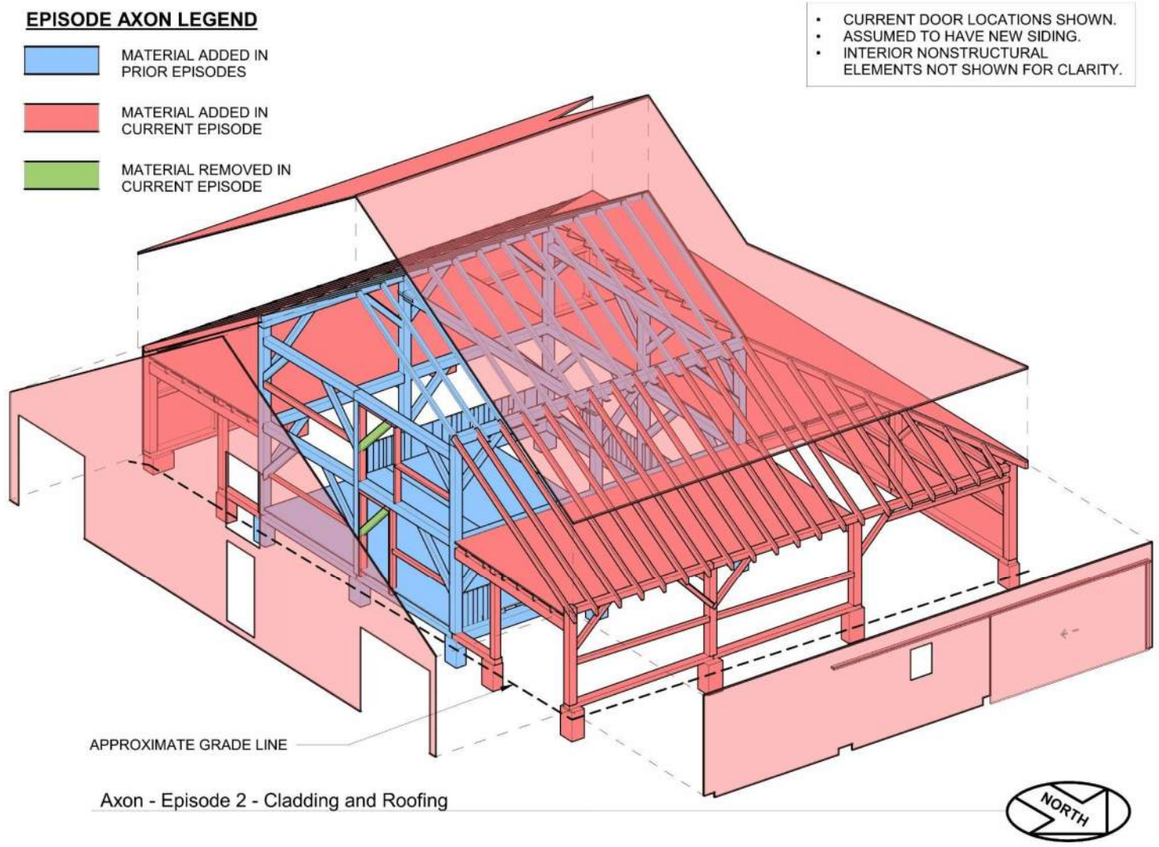
Warren K. Morehead led excevations at Hopewell Mound Group. He changed the earthwork complex's name to reflect the current landowner, M.C. Hopewell. A later newspaper article noted that the Hopewells never lived on the farm.

1891-92

Period of Significance

Carson-Steel Barn Workshop
June 2024

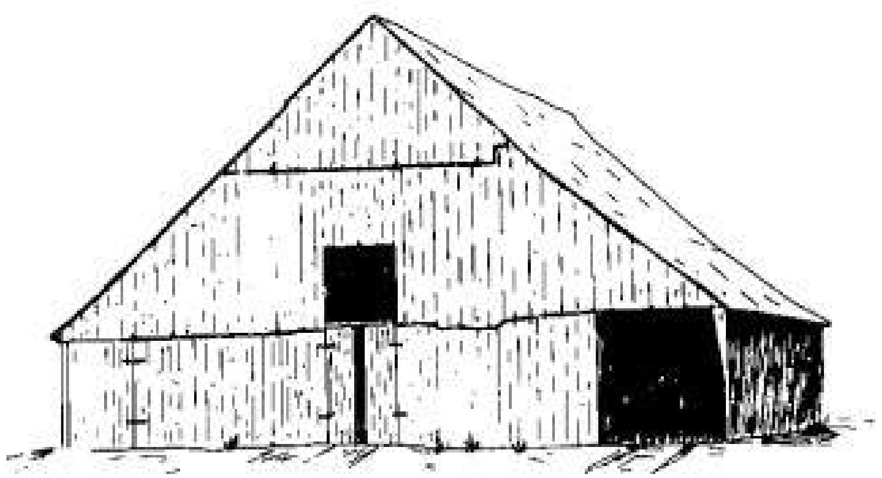


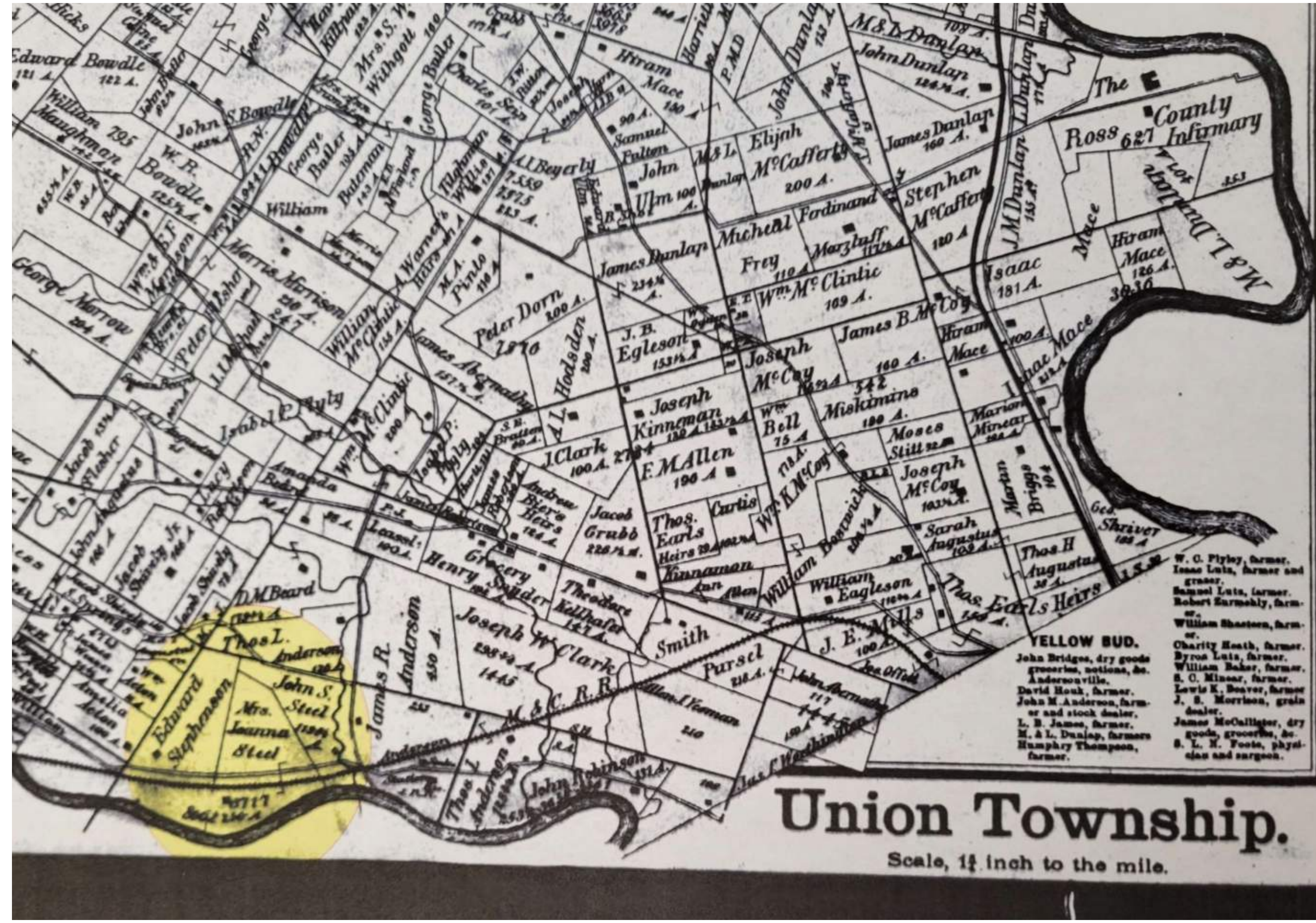


Historical Episode Diagrams: ca. 1868

Carson-Steel Barn Workshop
June 2024

Fig. 1–24 The Midwest three-portal barn, type 1



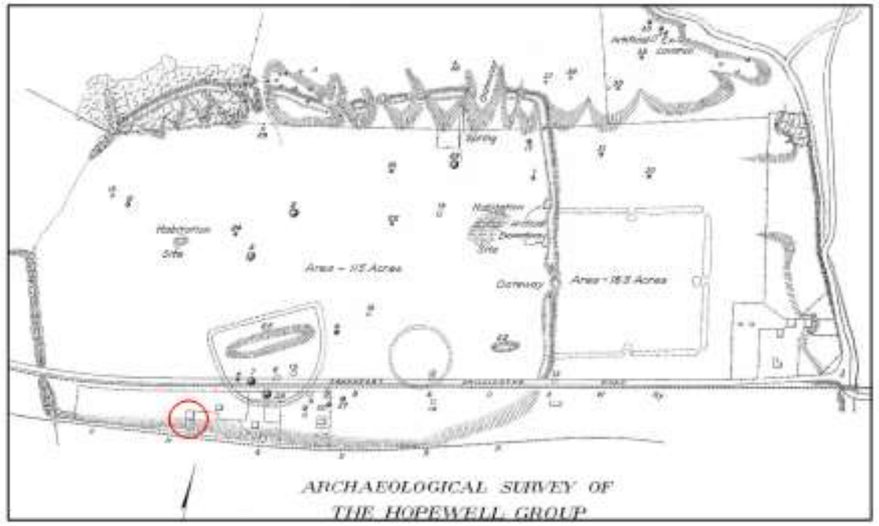


Episode 2 – Barn Expansion 1868-1888

- The barn was expanded to its current form ca. 1868 for Joanna Steel, who owned the farm until her death in 1888.
- She was one of just two female farmers listed in the county business directory in 1875.

EPISODE 3. M.C. HOPEWELL, ARCHAEOLOGICAL INVESTIGATIONS, AND CONTINUED AGRICULTURAL USE: 1890-1973





M.C. Hopewell dies, leaving most of his estate to his wife Ella, including their house in Chillicothe and "... two farms situated in Union and Twin Townships... one of which contains 261 acres known as the Johanna [sic] Steel Farm."

1903

Henry C. Shetrone conducted excavations at the Hopewell Mound Group. That project produced photos of the Hopewell farm, including a rare photo of the Carson-Steel Barn and the overall farmstead.

1922-25

Ella R. Hopewell dies, no children. Her will directed that the Union Township harm be sold and the proceeds were to go to relatives of her husband and various charities.

1938

Hopewell heirs sell the barn property to the Accord family.

Ca. 1938

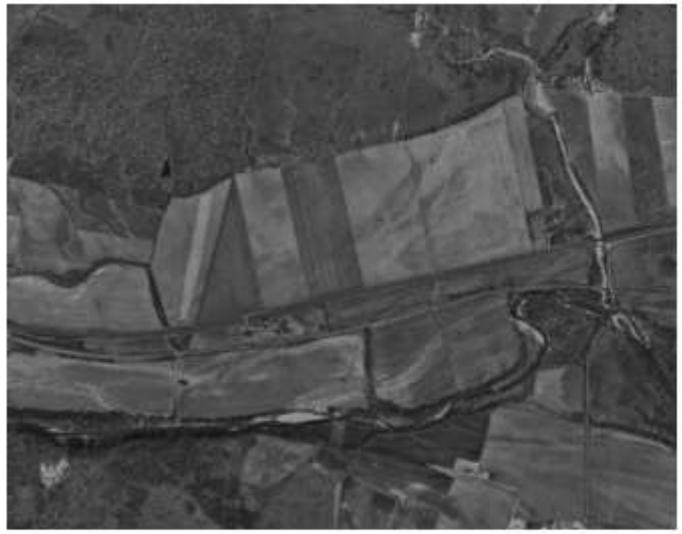
Topo map shows three buildings at the barn site, laid out like the farmstead shown in the 1984 photo.

1944

Accords sell the barn property to the Johnsons

Ca. 1967

EPISODE 4. PUBLIC OWNERSHIP: 1973-PRESENT



Hopewell Mound Group listed in the National Register of Historic Places as a National Historic Landmark.

1974

Johnsons sell the property to Earl and Genva Ray.

Ca. 1976

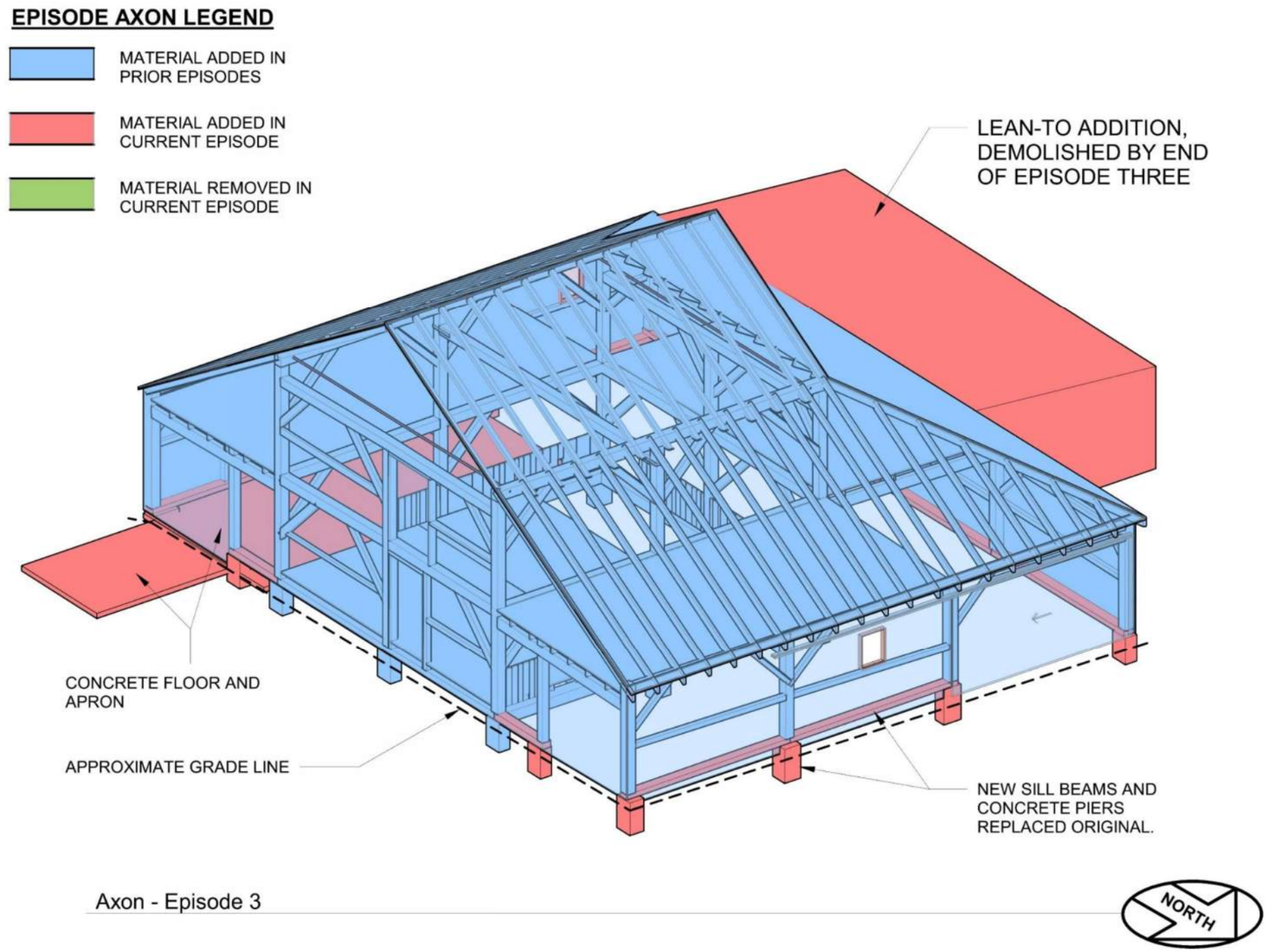
Part of the Hopewell Mound Group was purchased by the non-profit Archaeological Conservancy from private landowners. That did not include the barn parcel.

1980



Episode 3 – M. C. Hopewell and Continued Agricultural Use: 1889-1973

- Hopewell never lived on the farm.
- The barn continued to operate as part of a small farmstead, with no major alterations.

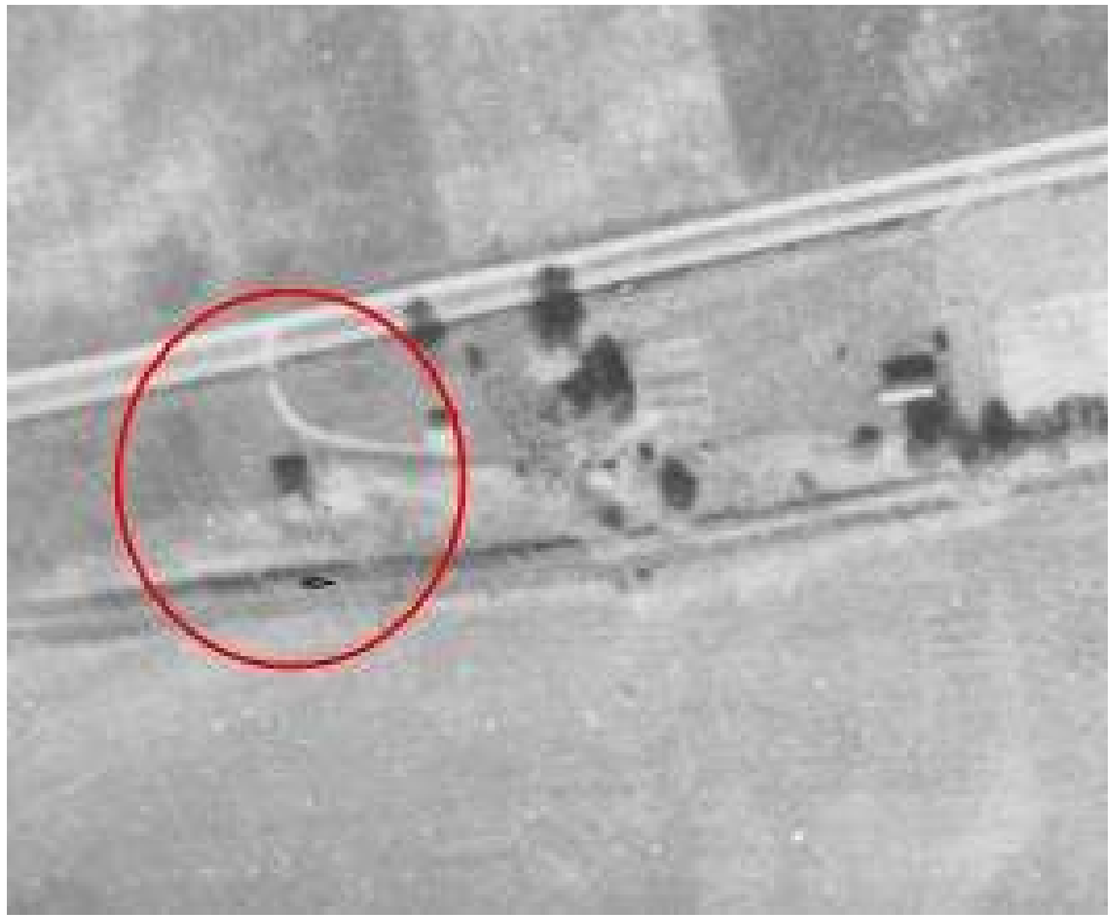




Historic Photos

Carson-Steel Barn Workshop
June 2024

Photograph, ca. 1922





Historic Photos

Carson-Steel Barn Workshop
June 2024

Photographs, 1938, 1962

EPISODE 4. PUBLIC OWNERSHIP: 1973-PRESENT











Vintage Aerials photo shows the barn, with a second west addition, along with the rest of the farmstead. There is a small saltbox house on the east end of the farmstead that may be the house Clark built in 1841.

1984

Another Vintage Aerials photo show the barn, now without the second west addition, along with the rest of the farmstead. The saltbox house has been replaced with the house now on the property.

1995

Plat Book shows the barn parcel south of the railroad was owned by Earl and Genva Ray, who also owned the house lot to the east of the barn. The Ray family still owns the parcel to the east, per 2023 Assessor records.

1997

The Adena Recreation Trail was extended through Hopewell Mound Group, along the right of way of a former railroad.

1999

"Archaeologists from NPS and Ohio State University used Magnetometry to investigate the earthwork complex. They found no evidence of long-term settlement along the southern boundary of the Hopewell Mound Group.

2001

US acquired 25.29 acres of land now known as NPS Parcel 102-5 from Earl and Genva Ray through condemnation.

2003

CLI notes the barn scheduled for demolition in 2009

2008

Historic barn expert Rudy Christian assessed the barn, corn crib, and shed. The barn was the only building identified as historically significant.

2014

Eligibility Assessment submitted to the Ohio Preservation Office yields a response that it may be eligible for the National Register, for local significance in the area of Architecture.

2024



Historic Photos

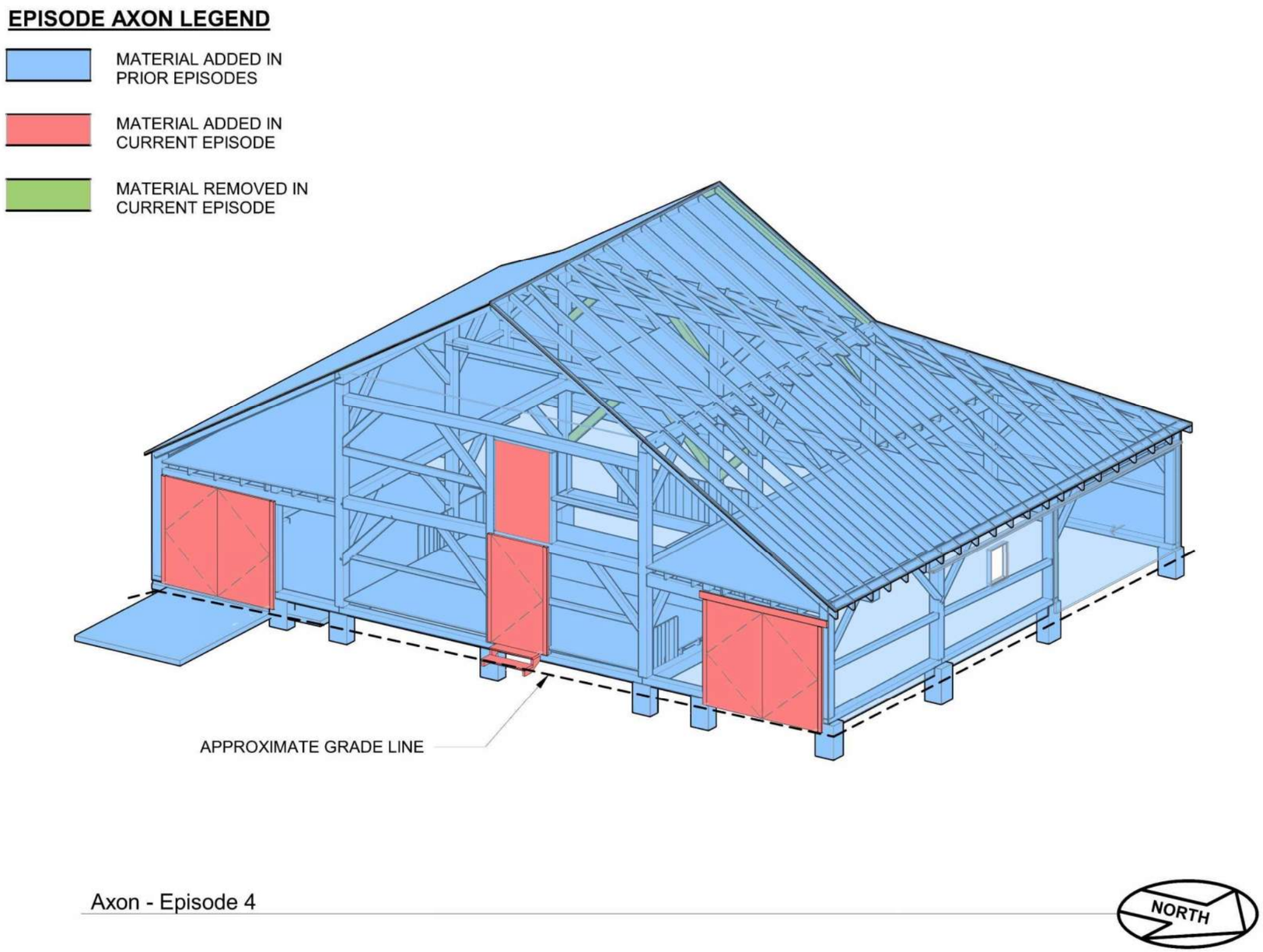
Carson-Steel Barn Workshop
June 2024

Photograph, 1984



Episode 4 –Public Ownership: 1974 to Present

- Part of a working farm for part of this period
- Storage under park ownership



Character Defining Features

· Heavy timber frame of original ca. 1831 barn and ca. 1868 addition.

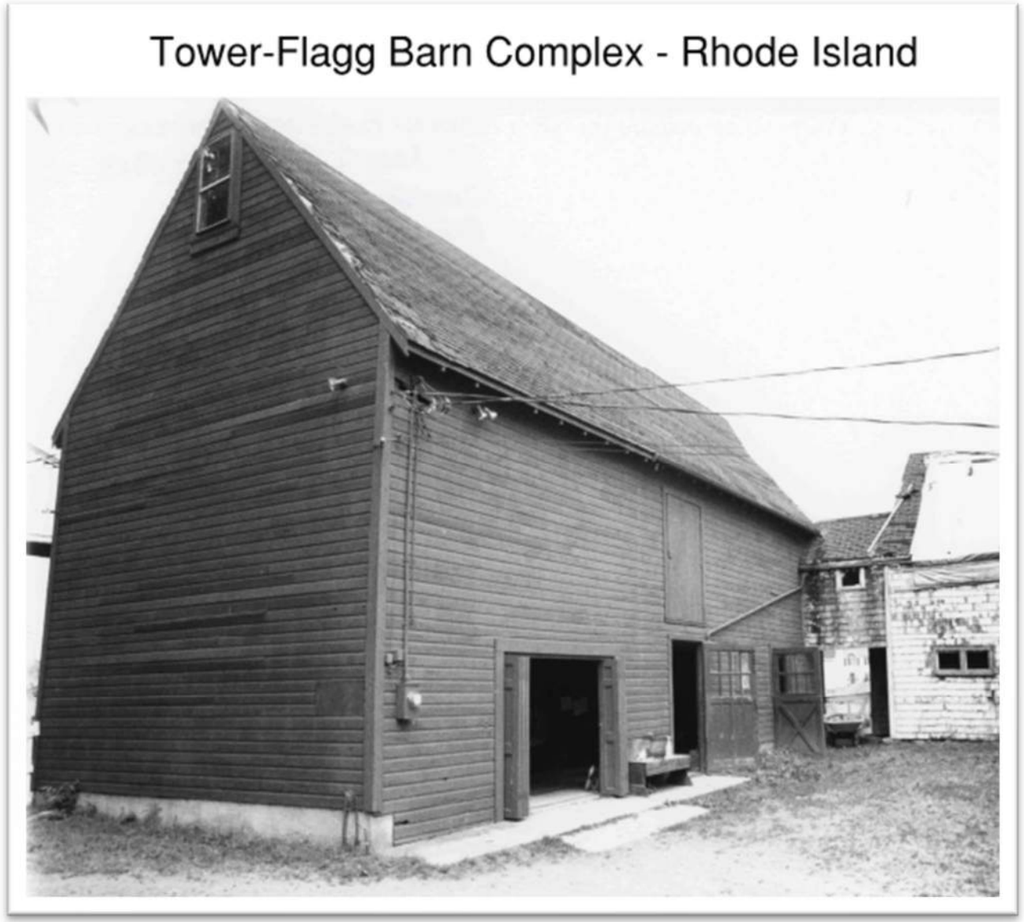
· Waist/waste walls and wood flooring

· Roofline and general form of the building. The date of roofing is unknown, but it may date to 1868 or later.



National Register Eligibility

- Preliminary National Register Questionnaire submitted to Ohio H SHPO in March 2024
- “Appears to qualify under Criterion C … for its design and construction as a combination of Scribe Rule and Square Rule, Timber Frame Barn.” [Abby Marshall, Ohio SHPO, April 2024]
- More data needed on comparable properties before a nomination could be prepared.
- Preliminary research identified more than 40 Ohio barns of comparable age. Most of those are listed in the National Register.
- Only 6 NR-listed buildings in the US are known to utilize Scribe Rule construction; five of those are barns.



The park educates the public about the daily lives, contributions, perceived values, and interactions of the Hopewell peoples with other peoples and the environment around them.

The significant sites in the park and related sites are protected and preserved by various means, and the local community feels a sense of stewardship for these and other sites.

The visitor leaves the park and related sites with a greater knowledge about the Hopewell culture, an understanding of the relationships between the sites, an admiration of the Hopewell accomplishments, and a cognizance of the need to preserve them.

Hopewell Culture National Historical Park Mission Statement

Carson-Steel Barn Workshop
June 2024

NO ACTION

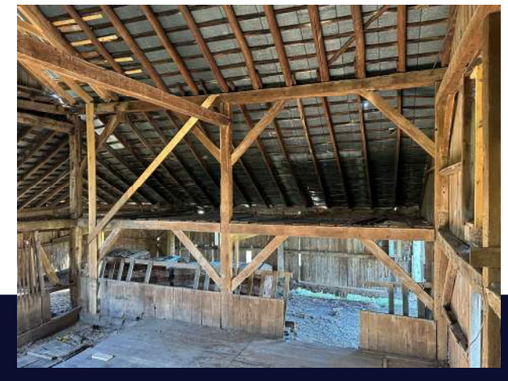
The barn will fall if left alone - immanent danger of collapse
Life safety issue for nearby visitors
The barn is locked--barn appears part of adjacent farm
Holes in walls allow access
Does not represent responsible resource management

DISCUSSION:

Local and state reputation of NPS and HCNHP - **Friends of Ohio Barns** and Ross County Historical Society
Friends groups interest in helping the barn?

FURTHER CONSIDERATIONS:

Park would seek support from Region based on intended treatment
Archaeological concerns if barn collapses



Treatment Alternative Options

Carson-Steel Barn Workshop
June 2024

TREATMENT ALTERNATIVE 1: STABILIZATION AND BASIC MAINTENANCE OF THE EXISTING BARN

DISCUSSION:

Stabilize & weatherproofing - short term treatment
This would require an AE team to design - NCPTT or external team
After stabilization, what is the maintenance capacity of the Park
The Park has bid a stabilization package, but the contractor backed out
Likely to include shoring walls and roof shoring or repairs
Process can include allowing the building to settle prior to shoring work
Does the barn need cordoned off due to unstable condition?
Contracting--set asides can negatively affect bids
Can Region do Design -Build? Contracting does not prefer
    Bigger question is who is the available pool of contractors?

This is a first step towards a long-term treatment



TREATMENT ALTERNATIVE 1: STABILIZATION AND BASIC MAINTENANCE OF THE EXISTING BARN

PROS: -

CONS: -Safety & compliance concerns restrict work & who will do the work

FURTHER CONSIDERATIONS:

106 Compliance - four step process may be sufficient

Archaeological concerns

Park would prefer to go through full compliance for this scale of project

Layered contracting approach

Temporary stabilization can become 'permanent'



Treatment Alternative Options

Carson-Steel Barn Workshop
June 2024

Rehab work may diminish integrity past eligibility

Foundation work would impact the primary resource
70% historic replacement--
Treatment is time sensitive

BARN REHABILITATION OVERVIEW

- *If saving, then stabilization and weatherization will be the first recommendation (outlined in Alternate 1)*
- *AE Team will be required to provide the repair details.*
- *Work must be completed by an expert timber framing contractor.*
- *It is anticipated to replace about 40% of the ca. 1831 barn structure and about 60-70% of the ca. 1867 addition structure, as well as all of the siding and roofing, flashings, and doors.*
- *Repairs in situ are not recommended for this structure due to the extent of the required work.*
- *If Rehabilitation for long-term, documentation and Disassembly is recommended in order to expose potentially serious concealed conditions. This will also allow for foundation / footing access and likely new footings.*
- *Rehabilitation Strategy – repairs and replacement sections should be constructed of wood, where possible, matching the historic timber elements, in the same or similar species. Since almost all components are load bearing or structural, other types of repairs, such as epoxies and consolidations will not be adequate.*
- *It is not clear if the barn will be eligible for National Register listing if the barn is completely disassembled and reassembled with some new components, new siding and new metal roof. This will require further discussion with the SHPO.*

TIMBER FRAMING REPAIR

Current preservation standards prioritize repairing and replacing deteriorated timber with Dutchman repairs that maintain the original materiality and craftsmanship. Mechanical fasteners are used in certain types of repairs.

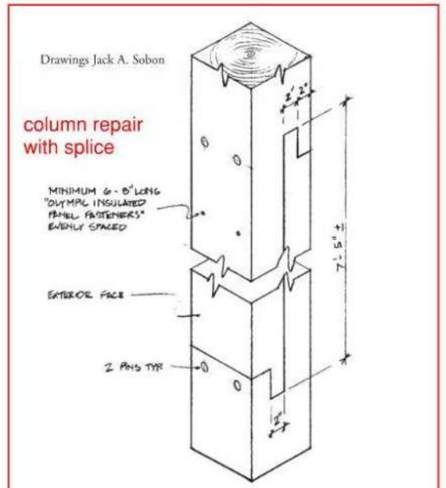


Fig. 3. Half the thickness of this post was hacked away to conceal it in a stud wall. The elongated scarf joint retains the maximum amount of the original post. The usual pins through the blades secure the joint, while slender deep-thread fasteners keep the long laps from separating in the middle.

If the entire scope of the work is beyond the budget, the structure needs first to be stabilized. The repairs can then be ranked and the client can phase the work to accommodate the budget.

For museum work, relocated structures and large projects requiring extensive repairs, full framing drawings are necessary.

**Available directly from the Guild (413-623-9926 or tfguild.org).*

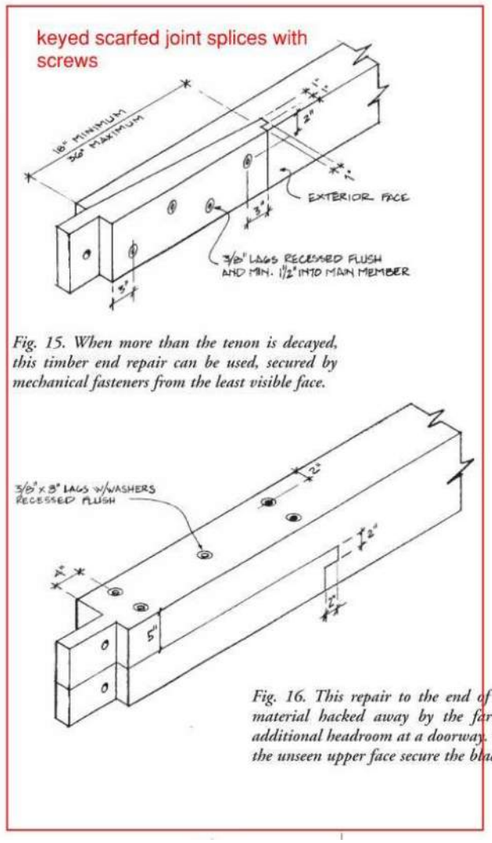


Fig. 15. When more than the tenon is decayed, this timber end repair can be used, secured by mechanical fasteners from the least visible face.

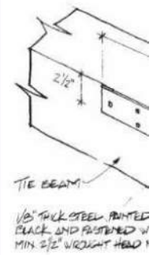


Fig. 18. Later ca dovetail joint at mortise in this 1 cated steel gusset

Fig. 16. This repair to the end of a girt replaced material hacked away by the farmer to provide additional headroom at a doorway. Lag screws from the unseen upper face secure the bladed lap .

"Frame Repair Techniques", Sobon, Timber Framing, 2003

Rehabilitation

Carson-Steel Barn Workshop
June 2024

TREATMENT ALTERNATIVE 2: REHABILITATION OF THE EXISTING BARN FOR PARK USE

DISCUSSION:

-Rehabilitation, electrical, etc.
-Restrictions on storage:
    -Raised floor, size of doors, dirt floors,
-Is maintenance equipment storage appropriate in an historic barn?
-Compatibility with cultural landscape?
-The Park has limited storage, and limited potential storage sites



TREATMENT ALTERNATIVE 2: REHABILITATION OF THE EXISTING BARN FOR PARK USE

PROS:

-The historic resource is kept

CONS:

-Cost is prohibitive
-Not well suited for storage
-Use as maintenance facility diminishes interpretive use
-Security issues

FURTHER CONSIDERATIONS:



TREATMENT ALTERNATIVE 3: REHABILITATION OF THE EXISTING BARN FOR VISITOR USE

DISCUSSION:

-Possible themes:
- -Indian Removal Act
- -M.C. Hopewell owned this site
- -Early archaeological investigation of the earthworks
- -Scribe & Square Rule framing techniques
- -Distance from parking, visitors services, accessibility
- -Does it need sprinkled?
- -



TREATMENT ALTERNATIVE 3: REHABILITATION OF THE EXISTING BARN FOR VISITOR USE

PROS:

-Resource is preserved
-Story--trees felled pre-I.R.A. while reservations were still in state, and transition to agricultural use

CONS:

-Compliance
-Impact on viewshed
-2024 code wind load requirements
-No views of mounds from inside barn
-Security issues
-No way to climate control the structure
-Site disturbance--parking esp.--not preferred within earthworks

FURTHER CONSIDERATIONS:

-Sprinkling would be required if it contains artifacts or if it is considered an artifact
-Intermittent staffing
-Could it be an open barn -
-Communication & relation with neighbor
-Partnership with County Park system - they maintain the trail
-Interpretive opportunities of Cryder & Blackstone Houses



TREATMENT ALTERNATIVE 4: HISTORIC USE / LEASING OF THE EXISTING BARN

DISCUSSION:

-Outline from Tracy Simmons re: this process
-Difficult to find a purpose appropriate to its location in the earthworks

FURTHER CONSIDERATIONS:



Treatment Alternative Options

Carson-Steel Barn Workshop
June 2024

The Park's interpretive sub-theme does include 19th century - present Native American connection to the site

Cryder House at Hopeton Unit & Blackstone House

TREATMENT ALTERNATIVE 5: SELL / SURPLUS THE BARN STRUCTURE

DISCUSSION:

-Disposition process is tiered-first offered to other parks
-How does this affect Park Interpretation? - contemporary to Indian Removal Act, consider CLR
-Archaeological consideration of having contractors doing demolition
-Park would be responsible for dealing with the foundation

FURTHER CONSIDERATIONS:

-What is the NPS process for this?
-Cuyahoga Valley NP has historic barns--they have no interest in this barn
-If restrictions are placed on use, is there any way to enforce this? - if sold to a private entity, no
-This would be considered real property--typically auctioned
-The Park is not involved with planning/executing theWorld Heritage VC in Chillicothe
-Liability of disassembly
-Archaeological work may be required before any disassembly work
-After removal, the Park would not have major time sensitive archaeological investigations
-GSA auction - possible to place time restrictions
-Buyer would still need to have the resources to disassemble the barn
-Cuyahoga Valley is going through this process



Treatment Alternative Options

Carson-Steel Barn Workshop
June 2024

TREATMENT ALTERNATIVE 6: DEMOLISH THE BARN STRUCTURE

DISCUSSION:

-Demolition is authorized when it is determined to be a suitable / appropriate course of action
-This alternative is that the contractor tears it down and takes everything
-Consider what portion of the barn has interpretive value--tell the story with the stones?
-Does alternative 5 need to be followed through before alternative 6?
-The contract could include salvage of specific elements for return to the NPS
    -This adds time, money, and liability
-Preferred demolition method is disassembly to lessen archaeological mitigation

FURTHER CONSIDERATIONS:

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-Park partnership agreement with Ohio Barns or similar--
-Charles Woodring and John Bechtel-Financial Assistance Officer-may have input on the process and obligations

-To be verified--this does not need to be managed as disposition of Federal property



Treatment Alternative Options

Carson-Steel Barn Workshop
June 2024

TREATMENT ALTERNATIVE 7: Dismantle and store for future use without prior stabilization

DISCUSSION:

-Storage location is the primary concern
  -Would this require a lease?
  -How much is salvageable?
  -Dayton may have a temporary storage facility -- less than 5 years
-This would still require a contractor to salvage
-Avoids Treatment Alternative 1 - stabilization

FURTHER CONSIDERATIONS:

-



Treatment Alternative Options

Carson-Steel Barn Workshop
June 2024

Community Engagement

~~TREATMENT ALTERNATIVE 7:~~ ~~Dismantle and store for future use without prior stabilization~~

-

DISCUSSION:

FURTHER CONSIDERATIONS:

-

NEXT STEPS

-Provide the Park & Region time to make a determination based on today's workshop

-After this determination, team can reach out to SHPO to determine compliance

-From a preliminary point, Region considers Alternative 6 - Demolition - to be an acceptable alternative

-Mitigation - is there additional mitigation needed?

-Sometimes mitigation includes planning an interpretive element

-Consider hazmat implications



Treatment Alternative Options

Carson-Steel Barn Workshop
June 2024



Thank You for Participating

June 26, 2024

STRATA
ARCHITECTURE + PRESERVATION

TREATMENT WORKSHOP NOTES

HSR and National Register Nomination for the Scribe Rule Barn
Hopewell Culture National Historical Park
Chillicothe, OH 45601
HOCU 314612

Wednesday, June 26, 2024
8:30 – 2:30 – Hybrid - Online & at Hopewell Culture National Historical Park, Chillicothe, OH.

MEETING ATTENDEES (In Person and Online*):

HOCU NHP
Chris Alford, Superintendent
Dr. Bret Ruby, Park Archaeologist
Dr. Tim Everhart, Park Archaeologist
Susan Knisley, Director of Interpretation & Education
Drew Long, Maintenance Worker Supervisor
Dave Martin, Facility Manager

NPS / REGION
John Rosemurgy, Project Manager
Kevin Schluckebier, Regional Program Manager of Design and Construction*
Ronald Cockrell, Regional Historian*
Dallas Kendrick, Asset Management Branch Chief*

OHIO STATE HISTORIC PRESERVATION OFFICE
Abby Marshall, Survey and National Register Manager* (partial attendee)

A/E Team
Angie Gaebler, Historical Architect/Contract Manager, STRATA
Zevi Aronstein, Historical Architectural Designer, STRATA
Natalie Anderson, Historical Architectural Designer, STRATA
Debbie Sheals, Architectural Historian, Building Preservation
Jenna Bresler, Structural Engineer, Silman*

REFER TO THE ATTACHED PDF OF THE POWERPOINT PRESENTATION PRESENTED DURING THE WORKSHOP AT THE BACK OF THESE NOTES.

1.0 - WELCOME
Greetings and Introductions
Workshop Agenda / Housekeeping / Lunch and Break Discussions

2.0 – ORIENTATION AND WORK TO DATE
1. Introduction: John Rosemurgy
1. The project came about because the park requested assistance to determine the historical and cultural significance of the historic barn, identify potential uses, and determine what repairs would be required. This HSR is a result of responding to the park for technical assistance to help manage this resource that is shrouded in many questions.
2. Barn was renamed the 'Carson-Steel Barn' during the research and investigation phase of the project to reflect the families involved in its construction.
3. Site Orientation – Presented site maps, 3D models, and floor plans of the barn.

a. Carson-Steel Barn sits at the southwest corner of the Hopewell Mound Group, either on or adjacent to the south wall of the enclosure.
b. The old railroad right of way sits north of the barn, and south of the barn is a steep drop-off that leads to Paint Creek.
c. There is an adjacent private property – a contemporary house – located east of the barn. The barn was once part of this farm property.

4. Work to Date
   a. On-Site Survey by AE Team – STRATA and Silman
   b. Matterport Survey & 3D Scan
      a. As the barn is not orthogonal, due to settlement and manner of construction, the three-dimensional resources are extremely helpful.
      b. Overview of navigating Matterport online viewing – available for 'traveling' through barn in 3D and zooming in for more close-up views.
         i. Demonstrated the interior space
            1. Raised central floor barely above grade
            2. U-shaped addition around 3 sides – north, west, and south.
   c. Dendrochronology carried out last October during the AE Team site visit
      a. Nick Weisenberg, a Dendrochronologist from the College of Wooster Tree Ring Lab, was on site and demonstrated methods for sampling/coring the timbers to the Park and AE Team.
      b. Many timber members of the main center barn and adjacent additions were tested. Timbers were mostly from the late 1820s and early 1830s in the main barn and from the 1860s for the U-shaped addition. These helped to establish construction dates for the two portions of the barn.
   d. Timber framing workshop
      a. 'Barn and Cabin Friend' owner, Raymond Friend, was on site to review the timber framing of the barn.
      b. He, along with Nick Weisenberg, provided insight to the Park and AE Team on the timber framing techniques used in constructing the two sections of the barn. They brought historic tools along for the demonstration.
      c. Raymond assisted in reviewing the conditions and outlining methods for repairs.
   e. Determination of Eligibility has been submitted and reviewed by the SHPO. They believe the barn is currently eligible to be listed in the National Register of Historic Places.
   f. A 70% Working Draft of the History and Existing Conditions were sent to the Park and Region to prepare for this Workshop. This is a working draft and is not ready for final review.

3.0 – EXISTING CONDITIONS

1. The Carson-Steel Barn is varied in its overall condition. Some historic framing of the barn is in good structural condition, while other sections have completely failed. Without intervention soon, the structure will continue to fail and will not be repairable.
2. Aside from the exterior siding and roofing, the building is primarily composed of structural elements.
3. Structural Failure is due to a compound of issues
   a. Previous storm damage (twice) with sections of missing roofing
   b. Leaking roof/flashings allowing water to infiltrate
   c. Pests below the finished first floor piling dirt along the wood framing
   d. Differential settlement of the stone piers has shifted framing, dislodging joints
   e. Pests that have infested certain sections of the wood structure (powder post beetles, carpenter bees, termites, and rodents) do not seem to be currently active.
   f. Deterioration of siding exposing structural elements to weather
   g. Settlement of interior concrete floor (south addition bay)
4. Structural Failure includes

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a. Deteriorated sill beams (south and west)
b. Buckled posts (west)
c. Deteriorated posts (west and south)
d. Missing post (west addition)
e. Deteriorated first-floor structure (center)
f. Deteriorated rafter plates
g. Deteriorated rafter ends
h. Deteriorated and missing rafters from storm damage
i. Deteriorated loft framing and supports

4.0 – GOALS OF THE HISTORIC STRUCTURES REPORT FOR THE CARSON-STEEL BARN PROJECT

1. Document the Historical Background and Context
2. Record the Chronology of Development and Use
3. Identify Character-Defining Features
4. Provide Documentation and Physical Description
5. Provide a Conditions Assessment
6. Develop a Treatment Plan, including alternatives
7. Determination of Eligibility and NR Nomination

5.0 – PROJECT FACTORS

1. Factors for Decision-Making
    - NR Eligibility
    - UNESCO World Heritage Site Designation
    - Previous CLR Treatment Recommendations
    - Preserve Original Material
    - Preserve Context
    - Potential Compatible Uses
    - Repair / Rehab Costs and Long-Term Maintenance
    - Staffing Requirements
    - Secretary of the Interior's Standards for the Treatment of Historic Properties
    - Factors Added During Workshop
    - Visitor and Staff Safety and NPS Liability Concerns
    - Hazardous Materials Remediation for Lead Paint
        1. Archeological Concerns
    - Archeological Concerns with Potential Collapse, Removal, Dismantling, or Rehabilitation (All will require some ground disturbance)
    - Public Opinion
2. 2016 CLR – Reviewed Treatment Recommendations
    - Treatment Alternative 1 (Not Preferred):
      Non-contributing features, including the Carson-Steel Barn, can be used to interpret the early archaeological investigation of the earthworks.
    - Preferred Treatment of Buildings & Structures:
      At Hopewell Mound Group, rehabilitation emphasizes revealing the spatial qualities of the Great Enclosure. Existing large-scale intrusions, including utilities, structures, and other non-contributing features that do not reflect the Hopewellian earthwork complex will be removed and/or relocated.
        - Long-term treatment recommendations are to remove all buildings and structures from the earthwork complex, in order to protect the setting of the archeological landscape.
        - The park will work with property owners to develop a long-term plan to remove buildings that impact the earthwork.
    - *Discussion*

      Bret Ruby: Tribal partners are very much engaged with the park, but they now want the full continuum of history and the full story to be told. Resources like this, in their eyes,

present an opportunity to explain why tribes are no longer present in the area and their displacement to Oklahoma. They were not vocal in the opinion that the structure has to go, but their interest in telling the story of removal and their connection to the land has increased in the last few years.

Ron Cockrell: Is this the best place to do that? Chillicothe will have a visitor center built that talks about the park units. Would there be an opportunity to talk about Native American story at this location?

3. Secretary of the Interior Standards

   Choosing an Appropriate Treatment for the Historic Property

   - The Guidelines are intended to promote responsible preservation practices that help protect the nation's irreplaceable cultural resources. But, once a treatment is selected, the Standards and Guidelines provide a consistent philosophical approach to the work.
   - Choosing the most appropriate treatment for a building requires careful decision making about a building's historical significance, as well as taking into account a number of other considerations:
     - Level of Significance. National Historic Landmarks, designated for their "exceptional significance in American history," and other properties important for their interpretive value may be candidates for Preservation or Restoration. Rehabilitation, however, is the most commonly used treatment for the majority of historic buildings Reconstruction has the most limited application because so few resources that are no longer extant can be documented to the degree necessary to accurately recreate the property in a manner that conveys its appearance at a particular point in history.
     - Physical condition. Preservation may be appropriate if distinctive materials, features, and spaces are essentially intact and convey the building's historical significance. If the building requires more extensive repair and replacement, or if alterations or a new addition are necessary for a new use, then *Rehabilitation* is probably the most appropriate treatment.
     - Proposed use. Many historic buildings can be adapted for a new use or updated for a continuing use without seriously impacting their historic character. However, it may be very difficult or impossible to convert some special-use properties for new uses without major alterations, resulting in loss of historic character and even integrity.
     - Code and other regulations. Regardless of the treatment, regulatory requirements must be addressed. But without a sensitive design approach such work may damage a building's historic materials and negatively impact its character. Therefore, because the ultimate use of the building determines what requirements must be met, some potential uses of a historic building may not be appropriate if the necessary modifications would not preserve the building's historic character. This includes adaptations to address natural hazards as well as sustainability.

Rehabilitation as a Treatment

Rehabilitation is defined as the act or process of making possible 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.

The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character.

Rehabilitation Standards

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.

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

- *Discussion*
  Ron Cockrell: National Historic Landmarks – error calls the barn a landmark and it is not. Nowhere in that nomination is the barn mentioned, there is no map, no photographs with the nomination. In the text, the barn is not even addressed in the National Register Nomination.
    - At the time the parks did not own the property.
    - Doesn't matter if the parks owned it or not, the nomination is for the Hopewell Mound Group and does not mention it. (Ron)
    - Common from the time period, they were much shorter at the time. Very brief. (Deb)

6.0 – HISTORICAL BACKGROUND AND CONTEXT

1. Period of Significance
   - Research, investigation, and dendrochronological testing found the previously estimated construction date of ca. 1800 was incorrect.
   - The barn was built in two phases. The period of significance begins **ca. 1831**, with construction of the first section, and ends **ca. 1868** when the addition was complete. The barn has seen no significant additions or alterations since the 1860s.
     - Dendrochronology identified likely construction dates for each section of the barn.
     - Primary and secondary sources identified early owners and major periods of development (episodes).
     - Primary sources included county records, period newspapers, census, and genealogical records.
2. Scribe Rule and Square Rule
   - The Scribe Rule method of timber framing, which required the services of at least one master carpenter, developed in England and Europe in the 1200s and was used in the American colonies and the United States into the first half of the 1800s.

- The less technical Square Rule method developed in the United States around 1800, and by the mid-1800s, it had almost completely replaced Scribe Rule.
- The Carson-Steel barn was built during that transitional period, and it provides a good example of both framing techniques.

3. Timeline of Historical Events and Episodes – *Refer to Attached Presentation Slides*
   - William Carson does not appear to have lived on the farm. Sold the barn not long after it was built.
     - Original structure of the original barn – unsure exactly what it looked like.
     - Mystery to experts as well. Unique instance
   - Joanna Steel
     - Took over the farm from her father and enlarged the barn. Dendrochronology determines the trees were felled the year her father died.
     - Structure seems to suggest the addition to the building may have been clad later, initially open.
     - She was one of two female farmers listed in the county business directory.
   - M.C. Hopewell buys the barn after Steel's death. Did not live on the property. There was a farmstead there, tenant farmer.
   - Barn remained in private ownership for a while.
   - 1973 National Register designation
   - Lean-to addition with shed in front (both demolished by now)
4. Character Defining Features
   - Heavy timber frame of original ca. 1831 barn and ca. 1868 addition.
   - Waist/waste walls and wood flooring
   - Roofline and general form of the building. The date of roofing is unknown, but it may date to 1868 or later.
   - Siding was likely added later, outside of the period of significance.
5. National Register Eligibility
   - AE submitted the preliminary National Register Questionnaire to Ohio SHPO in March 2024
   - Eligible for local significance and "Appears to qualify under Criterion C … for its design and construction as a combination of Scribe Rule and Square Rule, Timber Frame Barn." [Abby Marshall, Ohio SHPO, April 2024]
   - More data is needed on comparable properties before a nomination can be prepared.
   - Preliminary research identified more than 40 Ohio barns of comparable age. Most of those are listed in the National Register.
   - Only 6 NR-listed buildings in the US are known to utilize Scribe Rule construction; five of those are barns.

7.0 – MISSION STATEMENT - Hopewell Culture National Historical Park

*The park **educates the public** about the daily lives, contributions, perceived values, and interactions of the Hopewell peoples with other peoples and the environment around them. The significant sites in the park and related **sites are protected and preserved** by various means, and the local community feels a sense of stewardship for these and other sites. The visitor leaves the park and related sites with a greater knowledge about the Hopewell culture, an **understanding of the relationships between the sites, an admiration of the Hopewell accomplishments**, and a cognizance of the need to preserve them.*

8.0 – TREATMENT OPTIONS

8.1 – NO ACTION

Discussion

1. What does this look like if there is 'No Action'?
   Obviously, the barn will fall down.
2. What does this mean for the Park/NPS?
   a. In its current state of decay, the barn is a life safety concern.

i. With the private residence nearby – many would assume the barn is a part of that property and not enter the barn.
ii. While the barn is locked, the barn property and the barn are currently accessible to the public. Even though signs are posted for No Trespassing, the public can get through the holes in the walls. Plenty of kids and adults like to get into abandoned historic structures, and this is not stable. It is precarious enough that we had to be careful in our assessment (with ladders, our tools, where we walked, what we touched)

b. A dilapidated or fallen-down barn may affect neighboring property values and result in a neighbor dispute.
c. A fully or partially collapsed barn may damage the historic stone piers, resulting in archeological concerns.
d. John – no action alternative does not represent responsible resource management. Does not demonstrate responsible ownership to the people in the area.
    i. Bret - Mild call to action has happened in the last year, has raised awareness about the property, and essentially the NPS has been called out publicly for not taking care of the property.
    ii. So essentially, the park is already feeling the effect of "No Action;"
    iii. Dallas – who is upset with us?
        1. Friends of Ohio Barns is a state-level nonprofit that has written an editorial in its newsletter that specifically calls out the NPS for not maintaining the barn.
        2. A presentation has been given of a similar nature within the Ross County Historical Society.
        3. Do agree – we are responsible for taking care of structures, but additionally, there is not enough funding for some more basic needs. It is our responsibility to maintain our history and our structures, but we do have to consider our lack of funding and balance caretaking of multiple other resources.
e. Friends of Ohio Barns may have had an interest in helping to maintain the barn. Their involvement would likely be technical advice, and they are unlikely to supply funding.
    i. Regionally, the Friends of Ohio Barns are probably a pretty significant resource. Folks are of a high stature.
    ii. Ruby Christian, timber framer, has consulted with the park previously, as well as with the AE Team. He is also a very active member of the Friends of Ohio Barns.
f. Repurposing
    i. They have talked about loose alternatives to repurpose the barn structure. Suggesting that as a less desirable alternative to keeping it on site but pushing for some preservation option.
    ii. Can you keep the entire barn or only part of the structure (the original 1830s portion)?
    iii. The barn is an important resource in the State of Ohio.
g. What else does this mean for the park?
    i. Regional advice, regional support where it is needed, based on the intended treatment.
    ii. May require archeological intervention.
    iii. Intent beyond that point will be the largest factor.
        1. Do we rebuild after collapse?
        2. Do we remove it?
        3. Do we dismantle it for potential reuse later to make it safe?

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8.2 – TREATMENT ALTERNATIVE #1: Stabilization and Basic Maintenance (Mothballing)

1. What does 'Stabilization and Basic Maintenance' mean?
    a. This is defined as stabilizing the framing and keeping weather out. Put a stop of future and further deterioration.
    b. What is the park's capacity to complete this work?
        i. AE team opinion – the physical work required for the stabilization is not something the park is qualified to do. This is an unsafe structure, you cannot lean ladders on structure, and you cannot put any weight on the structure. Anything done from the exterior needs to be done from a lift. Scaffolding must be supported on the ground. Not something that the park has the staff or qualifications to do. Potentially another group within the NPS could take it on, but timing is an issue here as well.
    c. Dallas – big question – what would be the required maintenance level of the park? This is a considerable effort, but what does the park need for resources to continue long-term basic needs to keep it stabilized and weatherproof?
2. How does temporary stabilization affect the long-term goal?
    a. This treatment implies that there will be later treatment. Kicking the can down the road for future work while planning to design and fund additional treatment.
    b. Park had $175,000 in a stabilization / repair project once already. The contractor backed out and said they would not touch this project due to liability.
2. Temporary stabilization is NOT a repair. Still is risk involved (storm event).
3. Will the wood still deteriorate?
    a. Yes, some structure is still touching grade, which can continue deterioration, but the weather would not directly enter the building anymore and would slow deterioration.
4. What would stabilization and weatherization include?
    a. Probably would need to be some bracing added to the rafters, as well as shoring on the walls. The previous contractor walked away because they didn't have an AE design to follow. Any future stabilization / repairs would need to be carefully designed to prevent that from happening again.
    b. It is dangerous to work there, and it will continue to be dangerous.
    c. Jenna – in the past, with buildings of this condition, the contractor could shake things loose so imminent failures go ahead and fall, and then the comfort level of working in the space is slightly elevated to proceed with the physical stabilization efforts.
5. Should this area be roped off with a barrier? (Dave)
    a. Short of putting 6' or 10' high chain link fencing around it, it will not keep people out.
    b. 10' high construction fencing around it? Better than have the structure drop on someone. (Dave)
6. Stabilization is really the precursor to action and rehabilitation or repair. Just a reminder. (John)
7. Contracting for Stabilization Discussion
    a. Bidding depends on how it is advertised.
    b. Bidding on liability – increases costs.
    c. Bidding with limited competition also increases costs.
    d. Design Build contracts – Region does not generally like design-build. This may limit competition through not allowing that. Typically get hard pushback on design build. (Dallas)
    e. Kevin – AE package creates the boundaries of the work.
    f. Bigger issue – what is our pool of contractors that are willing to come out and take the risk, knowing you wouldn't even put a ladder on it today?

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g. Would have to bring an experienced federal general contractor. There are many timber contractors within the area, but they are not experienced in federal contracting projects.

Pros and Cons

1. Pros
    a. Stabilization keeps options open for future treatment and potential rehabilitation or dismantling.
2. Cons
    a. Cannot fix the grading issues, timber touching grade.
    b. Stabilization work will require some digging to support the temporary structure. This will trigger archeological investigation.
    c. Safety & Compliance concerns
        - Limits who will bid for the work.
        - Increases cost significantly.

Further Considerations

3. Section 106 Compliance – 4-step process may be sufficient.
4. The ground is so soft, so digging would be required – archaeological concerns.
5. Parks standpoint – should not go through streamlined process. Should involve SHPO and the Tribal consultation. Streamline compliance is off the table for something of this scale (Bret)

8.2 – REHABILITATION: GENERAL DISCUSSION

Before discussing the rehabilitation-focused long-term options, the group discussed what it means to rehabilitate the barn.

1. The heavy timber framing IS THE character-defining feature of this barn.
    a. It is important as part of any rehabilitation effort to consider the preservation and retaining of this historic fabric as the center of the treatment.
    b. Once the rehabilitation is designed, is there enough of the original materials remaining to consider the structure as historic?
2. Stabilization must happen no matter what, to work in the space. Rehabilitation means getting it to a point where stabilization is not visible, getting the structure to stand on its own.
3. Work with someone who is educated in timber framing construction, expertise in engineering and historic construction.
4. Determine what can and cannot stay. Current approach – cut out damaged heavy timber and replace with new.
5. Former preservation approach for heavy timber framing included a lot of epoxy. Current practices are moving away from that. Replace in kind with new heavy timbers. Can conceal screws if needed. Avoid epoxy. Celebrate craft.
6. The best way and most efficient way to fix the barn is to disassemble the framing. This is typical for barn rehabilitation and repair contractors and salvagers today. Because these are mortise and tenon joints, they come apart and can be put back together.
    a. The scan of the building shows that it has dropped at least 4" in sections, so it is out of plum.
    b. The approach is to take it apart from the top down, take it to a warehouse for detailed repairs, bring it back, and put it back together.
        i. More study would need to be done, but approximately 40% of 1831 structure would need to be replaced, and 60-70% of the 1867 structure would need to be replaced.

ii. When the percent replacement is this high, what do you really have remaining? (Ron)

7. The wood posts and sill beams are currently resting dry laid stone, although many sections are now resting on or within grade. This may be a combination of the piers settling and grade changing through the years.
    a. Over time the grade has risen to the point that it touches wood structure. Almost all sill beams and most posts have severe damage from contact with grade.
8. Do repairs require excavations?
    a. Yes, to an extent. Do not need to go super deep.
    b. The glacial fill in this area below the structure is essentially unconsolidated sand and gravel for about a meter down. It has no structural capacity.
    c. The structure is sitting on or very near the enclosure wall itself. Any kind of ground disturbance would be of great archaeological concern. This is the primary resource. (Bret)
    d. Archeological costs will be high for this project.
9. Our primary mandate is to preserve and protect. Dumping a ton of money into this - for what purpose? (Ron)
10. It is unclear if the barn will be eligible for National Register listing if the barn is completely disassembled and reassembled with partially new components, new siding, and a new metal roof. This will require further discussion with the SHPO.
11. Isn't the timing critical here? (Tim)
    a. Understanding of the report is that the structure will likely not make it through another winter. (Tim)

8.3 – TREATMENT ALTERNATIVE #2: Rehabilitation of Existing Barn for Park Use

1. BARN AS STORAGE – Limitations and Opportunities for Park Use
    a. The only advantage of a rehab of this barn for Park use is for storage.
    b. Barn would be fully rehabilitated to be safe and able to be occupied.
        i. Fully repairing the structure, new siding, new roof, and constructing footings where needed.
        ii. Probably will want electrical and security.
        iii. Barn rehabilitation, depending on use, may or may not require a sprinkler.
        iv. Current 2024 codes for wind loads may require a waiver. It is unlikely the structure can meet current standards.
        v. Will require grading, excavations, and trenching.
        vi. Will require Section 106 review.
    c. Interior floor is raised about 16-17" making it hard to use the center portion of the barn for equipment.
    d. Door to get inside is a normal-sized man door.
    e. Historic built-in wood mangers have been altered/cut to provide access between the 1831 and 1867 addition, but it is not built to be accessible, and would need to add stairs.
    f. 7'-9" x 7'-0" pairs of doors, not sized like modern commercial barns – too small to get modern equipment through.
    g. Can you store a mower in there? Yes, but then the issue is security. No way to secure that building.
    h. Would work best with a new concrete interior floor everywhere, including in the center.
    i. Storing gas equipment and cannisters would require proper storage.
2. Storage Use - Pros & Cons
    a. PRO - Retaining a cultural resource (non-contributing) yet a resource still.
    b. PRO/CON -

a. PRO - Currently no storage at Hopewell Mounds Group, and space is limited within the park for new storage opportunities. (If storage is needed, may be best near the visitor services area to the east).
b. PRO – Could store mowers
c. CON - We don't want to put storage inside the earthworks. This seems disrespectful.
d. CON - Why spend millions of dollars to have a new storage facility. (Chris)

c. CON – Storage is not a compatible reuse due to the work involved bringing it up to modern storage standards for equipment and supplies.
d. CON – Long term maintenance.
e. CON – Impact to viewshed in World Heritage Site Cultural Landscape. Day-to-day use as a maintenance facility diminishes the visitor impact and interpretation. Maintenance facilities require outdoor storage within the viewshed of the primary historic resource.
f. CON - If we put all the money into it, due to its historic nature, do we even want to store equipment and pallets in it? It was never built for this. If this is the reason we decide to keep the building, it does not make sense. (Drew)
g. CON - Balancing money and need, which is a heavy monetary investment for not enough need (Drew)
h. CON - Can we justify putting all this money into a cultural landscape resource just to use it for storage?
i. CON - Huge rodent problem, not something you can change. Without proper rodent protection, they will eat wiring out of equipment.
    i. The center floor structure was built to be above grade and have circulation underneath it. Changing this would seriously change the character of the barn.
b. CON – Significant compliance due to archeologically sensitive area.
c. CON – Project may be cost prohibitive.

8.4 – TREATMENT ALTERNATIVE #3: Rehabilitation of Existing Barn for Visitor Use

1. BARN AS INTERPRETATION
    a. An option for rehabilitation would be to utilize the barn for visitor interpretive use.
    b. Barn would be fully rehabilitated to be safe and able to be occupied.
        i. Fully repairing the structure, new siding, new roof, and constructing footings where needed. Taking the barn back to a point where a visitor can walk through the barn and see the repairs.
        ii. Probably will want electrical and security.
        iii. Barn rehabilitation, depending on use, may or may not require a sprinkler.
        iv. Current 2024 codes for wind loads may require a waiver. It is unlikely the structure can meet current standards.
        v. Will require grading, excavations, and trenching.
        vi. Will require Section 106 review.
    c. This is a high-touch approach.
        i. Universal Accessibility Required
            1. Long ways away from accessible parking.
            2. Signage
                a. Would have to do a study on what the accessibility requirements are; existing parking is too far away.
        ii. Sprinkling as a consideration
            1. County water
            2. Only need to sprinkle if artifacts are stored inside or if the building is considered an artifact.

        a. Artifacts are probably off the table as security will be an issue still. Need to protect images and reproductions, whatever interpretative media that is put in there.
    iii. Programming
        1. How often is it used?
        2. How often is it staffed?
        3. Why can't it be an open-air barn? Plenty of examples of this in the Rockies. (Drew) Within a national park that does close, but the barns themselves never closed. Our location on a county road would lend itself to unfortunate activities very quickly.
    iv. Still hard to keep pests out; that's a consistent part of the barn
d. Rehabilitation of the barn adds this structure to the story of the development of the land. This may be an opportunity. However, its construction is outside of the 'removal' story. Tribes were still living in Ohio, but that is not a focus of the current park's interpretation.
e. Barn remaining would require interpretive opportunities to be developed. Themes may include:
    i. Indian Removal Act
    ii. Hopewell Family, where the Hopewell name came from
    iii. Early archaeological investigations
    iv. Barn construction technology
    v. Transition of land to agricultural use
f. Consider the impact of increased visitors to the neighbor.
    i. Mr. A Hawkeye (neighbor) constantly notifies staff if there is something that is not acceptable. They have been good stewards. A conversation would definitely have to be had.
    ii. Increased pedestrian and potential vehicular traffic would be a concern.
g. Consider partnership with the County Parks System. They maintain the adjacent trail.

3. Visitor Interpretive Use - Pros & Cons
    a. PRO - Retaining a cultural resource (non-contributing) yet a resource still. This meets the Park's Mission Statement to protect, manage, and preserve natural and cultural resources for the visitor experience.
    b. PRO – Could provide some shelter for those on the nearby trail.
    c. PRO - Quite literally, some of these timbers were cut during the period of the Indian Removal Act and many of these are major points in the story. Expansion of the agricultural use of the land is a big part of the story. Not sure it reaches the necessary mark, but it is what makes this site unique from the others.
    d. CON – Potential impact to neighbor.
    e. CON - We have two other sites that demonstrate this narrative already. What is the advantage of this site being additional, at the price tag it will be to rehabilitate it?
        i. Cryder 1700s.
        ii. Blackstone House that is currently being worked on. Built directly on the earthwork with an unobstructed view of the Seip mounds.
        iii. These both potentially have a better opportunity to tell this story.
    h. CON - Would require additional staffing if used outside of special events or tours.
    i. CON – Long term maintenance.
    j. CON – Would require a significant upgrade to meet current universal accessibility standards. The center floor is higher than the surrounding shed additions. This will require a ramp. Interior dirt floor is not accessible and would need to be upgraded to an accessible-compliant material. Changing these items would alter the original character of the barn.

k. CON – Will require accessible parking and signage to be installed, which has a high visual impact within the enclosure and within the viewshed of the primary resource.
l. CON – Interpretation offers limited use of the structure for the $ involved.
a. CON – Will require grading, excavations, and trenching.
b. CON – Significant compliance due to archeologically sensitive area.
c. CON - Barn does not have any visual connection to primary resource from inside the building. However, you cannot see the historic components of the barn without being inside.
d. CON - No way to do climate control, so limited artifacts and/or media can be displayed.
e. CON – Security is an issue on a public trail that is open 24-7.
f. CON - Huge rodent problem, not something you can change. Without proper rodent protection, they will eat wiring out of electrical and security equipment.
g. CON – If only open 10-15 days a year, does this justify the cost?
j. CON - Balancing money and need, which is a heavy monetary investment for not enough need (Drew)

8.5 – TREATMENT ALTERNATIVE #4: Historic Use / Leasing

1. This alternative focuses on the NPS utilizing a leasing program with an outside vendor or leaseholder for a long-term lease on the barn structure. These leases can be decades long and require the leaseholder to maintain the structure.
2. Most leases would be looking for a return on investment, meaning they need this property to be income-producing. Income-producing uses of this property are not compatible with a location in the midst of an NHL sacred site.
3. Due to concerns about the ability to limit to only compatible uses, there was not much discussion on this alternative.
4. Speak with Tracy Simmons at Region. She can outline this process.

8.6 - Treatment Alternative #5: Sell / Surplus Barn Structure

1. The NPS would sell/surplus the barn structure to an outside bidder. This would be similar to selling a piece of equipment. The land is not sold with the barn. The intent would be to find a bidder interested in salvaging the historic timbers for reconstruction, used for construction of a new barn, or as salvaged timbers for repairs to another historic barn. However, the use cannot be dictated in the RFP.
2. Friends of the Ohio Barns have suggested salvaging the structure.
   a. At least a dozen companies in Ohio that this is all they do. Sometimes salvaged to save materials, sometimes salvaged to build a new barn elsewhere.
   b. 1830s structure does have some value for the timbers, joists, floorboards, and pole rafters that are not deteriorated. The1867 addition is a combination of new (1867) and surplus parts. The timbers, joists, floorboards in the lofts, and rafters, are still old growth and would have salvage value.
3. How does this affect the story that the park tells here at this site?
   a. Adding this to the potential story was one of the initial thoughts. Over the past year, this has dwindled a bit. It would be a sub-sub-sub-theme.
   b. Initially there was the thought that this barn dated to the treaty of Greenville. No longer part of it. But it does speak to the history of removal. It is a part of the second farm, not the initial, so it doesn't necessarily speak to the direct plowing over of the mounds.
   c. Ron – 2016 CLR suggested removing the barn. The SHPO did not object to that recommendation.
4. There is liability in salvaging or deconstructing/disassembling the barn structure.
   a. NPS Reuse in Different Park or Location:
      - Disassembly by NPS - This exposes the NPS staff to safety liability in salvaging or deconstructing/ disassembling the barn structure. This is not a viable option.

- Disassembly by Contractor for NPS Use: If salvaged for NPS use, can the work be done by a contractor and the salvaged material to be reused delivered to the NPS?

b. Outside Bidder/Contractor Takes All:
   - Assigning the responsibility of removal of the barn structure by an outside resource is the best outcome.
   - However, it may be difficult to assign methods and means of demolition.
     i. Some demolition contractors may use large equipment or wrecking equipment. Structural collapses may result in archeological damage to the surrounding area, including the piers. The successful bidder may be inexperienced in archaeological sites.
   - Contract may only allow the contractor to take above-grade wood framing, not the stone piers. Due to the archaeological sensitivity, contractor to leave the piers and the grade, and the park will still be responsible for dismantling the items in grade.

5. John reached out to Region property manager for more information on what this means.
6. Only about 60% of the overall barn structure may be salvageable for reconstruction or repairs to other structures.
7. The disposition process would likely start by offering the barn to other parks and explore other options before listing it for public sale.
   a. It is unlikely that other parks can afford the expense of the deconstruction, salvaging, and shipping materials.
   b. Chris checked with Sleeping Bear Dunes to see if they were interested in any timber framing components to complete repairs in their historic structures. They did not see a benefit to using resources that would require travel. They have local resources.
   c. Cuyahoga is removing around 300 structures. Park crews are salvaging what they can use. This is different from this project, in that this structure is not safe to work around.
   d. SOI may prefer differentiation between contemporary wood repairs and the older, original wood timbers. This would allow for new wood to be used over salvaged wood.
8. An RFP would likely be issued if offered to the public. This is Real Property – Maybe through auction or bids.
   a. No matter what a Contractor buys it for, they must have the means to do the work. Could buy for a small amount, but the work/labor for dismantling, selective demolition, and hauling will be costly.
   b. How do you pick a successful applicant?
      - Qualifications and Experience
      - Potential Reuse (likely not a factor). The government cannot put restrictions on the potential reuse of the barn – once it's gone it's gone. You can make them write an RFP, but once it's sold, the NPS has no authority to tell private entities what to do.
        - If the NPS is not using it somewhere, you lose all rights to dictate future manner of use.
9. There will be archeological sensitivity to dismantling the structure. The stone piers are buried partially in grade and would require excavation. There is also sensitivity to removal of the existing concrete piers and the slab.
10. If the structure is salvaged, what remains? Do you leave the piers/foundations in place for interpretation? What themes might that represent?
    a. Cryder House at the Hopeton Earthworks unit has remaining foundations that are visible and interpreted from an early house.
    b. Foundation remnants can relate to interpretive themes.
       - Sub theme forced removal of tribes
       - Trying to renew tribal connections
       - Story of what the barn has 'seen' through the years – part of the public's Ross County story.
    c. Assigning the responsibility for the barn's interpretation to an outside resource (not NPS) is not acceptable. This is the park's responsibility.

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- Context – there is a potential World Heritage Visitor Center to be constructed in a historic building in the Chillicothe city park. Funding is through Appalachian Funding. The park is only a 'sideshow' in the new Visitor Center project, not a leader. Park has very little say in the VC interpretation center and focus.

11. Potential salvage and reconstruction of timbers as a new structure, not necessarily as a replica. This still provides preservation of the timbers.
12. What is the park's responsibility to address archeological resources at the site before, during, and after dismantling?
    a. Bret – I think we might need to do some further archaeological work before the structure can even be dismantled. Some limited archaeology will be required no matter what we do going forward. Don't think there would be any crisis.
        - The park has done some test pits around that area. The report is not finalized.
        - Can't do any interior test pits with the structural risks there today correct? (Chris)
            - Definitely not.

8.7 - Treatment Alternative #6: Demolish Barn

1. This treatment option explores contracting for the barn's demolition by a Contractor.
2. Who is responsible for demolishing the barn?
    a. Contractor takes all liability for the barn. Take everything but the piers and concrete.
    b. The Government can outline a Scope of Work for the demolition and may exercise more control over the demolition methods and means than in Alternate #5 above.
    c. The Contractor can choose the specific methods and means for the barn demolition as long as they meet the intent of the Scope of Work.
    d. The Contractor may literally demolish the barn and take it to a landfill. They may salvage it piece by piece and sell it. They may salvage it for their own reuse. The NPS cannot dictate what they do with the structure once it's demolished, except that it must be taken to a licensed landfill. The contract will have a 'salvage clause.'
    e. The Contractor will address hazardous materials and safety as part of the demolition, including addressing lead paint.
3. Are we authorized to do this? (Bret)
    a. John – understanding is that demolition may be an option when it is justified.
    b. Demolition reduces footprint and operational costs.
    c. Demolition limits vulnerability and increases safety.
4. Alternate #6 is essentially the same result to the park of the barn removal as Alternate #5, but it's a different process.
    a. Prior option is a sale, and this option is a paid option to demolish the barn. This process is developed when there is a determination that the structure no longer has value.
    b. That is where I am not sure we have the authority to do that. We see that it has some value. (Bret)
    c. If it is torn down the value of interpretation does not necessarily go away. The value of interpretation is not necessarily in the wood. It can be in the foundation. (Chris)
    d. See this as the more practical option. (John)
5. Maybe this decision is part of a process. Start with Alternate # 5 and see if you have any takers. And then move forward with demo/Alt 6 if not.
6. Any piece of value has to be offered to parks before the demo can go forward in any shape or form – see discussion in Alternate #5 above. (Chris)
    a. Shipping costs to other parks alone would not make it worth salvaging for other park use. (Kim through John)
7. Salvaging Parts for Park:
    a. The park could outline a few pieces to be salvaged for the park to use as part of the demolition. (Kevin)

b. The NPS does this all the time - partial demolition - where certain items are designated as being carefully removed/salvaged, packaged, and relocated/delivered elsewhere. The Contractor is responsible for removing them in a way that they would still be usable. This will impact costs.
c. Salvaging specific items may add a level of complexity that will increase costs and decrease the number of contractors in the pool.
d. Salvaging structure that remains in good condition for NPS use may limit the number of interested bidders by decreasing the salvage value to them.

8. Will archaeological mitigation balance out costs? If you just come in to knock it down, it will likely need more archaeological mitigation, whereas more selective demolition will not. Might balance cost. (Tim)
9. As a follow up to the workshop, John conferred with several reginal advisers:
   a. Charles Woodring, MWR Property Coordinator, and Kelly Anderson, MWRO FMSS Specialist / Housing Program Manager. They discussed how to manage such a contract, whether it is a disposition of historic or federal property. The option for demolition is cosistens with NPS protocols.
   b. Janet Popielski, CUVA (Cuyahoga Valley NP) FM described demolition of buildings and salvage of historic architectural fabric that has market value – similar to the wood timbers in the HOCU barn. CUVA works crews will first typically salvage materials that they park can use. Then in the SOW for the demo contract, the park may include an option for salvage in which the contractor may extract materials for their own use. The salvage option can offset the cost of the demolition.

8.8 – TREATMENT ALTERNATIVE #7: Dismantling and Storing for Future Use Without Stabilization

1. The park introduced this new option during the workshop. This option would dismantle and store the barn for future use without stabilizing the structure.
2. Stabilization seems like it should be off the table because a more extensive rehabilitation project will not likely be funded. Why not disassemble and store it somewhere else and, at a later date, have the potential to reassemble the structure in a different location?
3. This option is cheaper and mitigates the larger risk of the structure falling during the course of work.
4. Dismantling the structure to restore the components off-site is a part of long-term rehabilitation regardless - why not skip over stabilization? This option allows for possible rebuilding later, without a deadline put on by the temporary stabilization in place.
5. NPS would have to lease property to store the structure inside. They do not have $ to pay for this.
6. Then the question becomes, what conditions does the facility need to have to store the pieces? (Kevin)
   a. NPS may have a facility in Dayton where it could be temporarily stored. (Dave)
   b. What portion of the barn would be salvaged? Only the 1831 portion. There are some nice oak timbers, joists, rafters, and floorboards in the 1867 portion.
7. PROs: Not paying to stabilize it.
8. CON: Long-term storage may become an issue with no immediate plan
9. CON: Upfront cost for selective demolition and delivery to storage
10. CON: Storage costs

8.9 - FURTHER DISCUSSION

1. The NPS may want to test the dripline around the barn to determine the level of lead paint in the soil so that mitigation can be addressed, if necessary. If soil mitigation is recommended, this may significantly impact archeological resources.
2. Ongoing bat survey – keep that in mind. No bats have been observed as of now.
3. **Alternate # 8 - Partnership Opportunities:**

a. Does the park know of any partners that could set up a partnership to dismantle and use the property?
b. Not easy, but may be more manageable from a political aspect.
c. The groups don't necessarily have the resources to do this work, but they might have people in their groups with the resources to do so.
d. Do we have any obligation to offer it to the public outside of the park before we go to demolition? (Tim) - No. (Chris)
e. Can we make a partnership agreement and get this taken down by the winter? (Tim) - No.
f. How do you establish liability?

4. Replacing so much fabric will likely result in losing national register eligibility. Deb will call and confirm.
    a. How does this affect decision-making?
    a. Removing 60-70% of historic fabric leaves very little. Impacts integrity (Ron)
    b. Can a federal entity demolish a National Register-eligible historic property? However, if rehabilitation is pursued, it may entirely lose its National Register eligibility.
        i. Cuyahoga is demolishing some 300 historic structures on site.

2. CLR recommends the preferred treatment to demolish the structure.
    a. CLR dates to 2016, and the tribes have changed their perspective on the interpretation of structures a little bit differently.
    b. Would have to negotiate with SHPO and tribes (Ron)
5. Community Engagement
    a. As a small park, all staff are frontline. Community engagement happens on some level by everyone.
    b. The park has a friends group. Public engagement is not typically done through the friends group.
    c. Are we looking at an angry mob because we are considering tearing down a historic structure?
        - Public Opinion
            - Community takes pride in their history.
            - Be prepared to discuss present costs – how would the public view investing $2-$3 million into the structure?
            - Small but vocal groups – we are the NPS!
            - Education and Understanding
            - Can interpretation be done through waysides and barn 'piers?'

8.10 – PREFERRED TREATMENT DISCUSSION

1. At this time, the park is leaning towards Alternate #5 or #6, but they will need more time to contemplate and understand the ramifications of this decision (both positive and negative).
2. The team will work with the park and give them a couple of weeks.
    a. Park may get more information in the following days.
3. Is there any opposition from anyone in the regional office to moving forward with Alternative 6: demolition? Or would everyone be supportive of that? (Bret)
    a. I don't know of anyone opposed. The CLR gives us a significant amount of information about the challenges with this building. Does not seem prudent or feasible. (Ron)
    b. Is there anything you see as a mitigation that we have not already done? (Bret)
        i. That is a discussion we would have to have with the SHPO (Ron)
        ii. What is your thought? (Bret)
            1. Pretty impressed with the work you've done so far. NHL needs to be removed from the presentation. The graphics are exceptional. (Ron)

iii. Sometimes, the SHPO asks for an interpretative piece. You can consider leaving the foundation or new interpretative exhibits already.

4. This barn is defined as 'property' in FMSS.
5. Waysides may be placed if demolished. A salvaged timber or joint from the barn could be displayed at the VC.
6. This Workshop is a testament to the process – through scholarship and thorough investigation – we are where we are now, with good information and the ability to make decisions based on what has come to life.
7. What is the process going forward for funding demolition? (Bret)
    a. LRF may fund demo projects. (John)
    b. Project statement would need to be in place to begin (to get on the list to be funded) (John)
        i. Dave would write this. STRATA can assist.
8. Park agreed Deb could talk to SHPO some more about the NR eligibility.
    a. Once rehabilitated, the structure would be dismantled, many components would be replaced, and it's likely the building would no longer be eligible for NR.
    b. It is likely beyond the means of the NPS to perform adequate rehabilitation for many reasons, costs included, whether or not it's eligible for the NR.
    c. Preliminary Section 106 will determine whether this is an adverse effect for dismantling or demolition.
    d. Ron- Present the option to SHPO and get their opinion – a way to start the process. Determine it is beyond our means to rehabilitate this building. Then initiate 106.
        i. Deb is contracted to do a National Register nomination. John may need to coordinate with contracting if there is a change in scope.

END OF NOTES

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Marriage Marks on Square Rule Timber Framing. (STRATA 2023)

E DETERMINATION OF ELIGIBILITY

March 28, 2024

Debbie Sheals
29 South Ninth St. Ste 210
Columbia, MO 65201

RE: Carson Steel Barn, Ross County, Ohio

Dear Debbie:

Thank you for your interest in the National Register of Historic Places and for your submission of the Preliminary National Register Questionnaire for the Carson Steel Barn. It appears the property qualifies for nomination to the National Register of Historic Places under Criteria C for its design and construction as a combination of a Scribe Rule and Square Rule, Timber Frame Barn. The Barn appears to retain historic integrity as laid out by the National Park Service for nomination to the National Register of Historic Places.

The nomination should discuss how this type of construction relates to other types in Ross County at the time of the Carson Steel Barn construction. We recommend researching to see if there were any others of this type and if there are any remaining. How rare was this type of construction?

You can now access online the National Register nomination form and our instructions and guidance on completing the National Register nomination at https://www.ohiohistory.org/preserving-ohio/national-register-of-historic-places/nomination-submission-process/. A sample nomination can be provided upon request.

If you have any questions, email me at amarshall@ohiohistory.org. We look forward to working with you as the nomination proceeds. Thank you for your interest in historic preservation and the National Register of Historic Places program.

Sincerely,

Abby Marshall

Abby Marshall
Survey & National Register Manager, Inventory & Registration
State Historic Preservation Office

Gmail Debbie Sheals <debsheals@gmail.com>

Re: Carson Steel Barn

1 message

Abby Marshall <amarshall@ohiohistory.org> Fri, May 10, 2024 at 12:27 PM
To: Debbie Sheals <debsheals@gmail.com>

Hi Deb,

Thanks for chatting with me yesterday. I am emailing you to follow up on our phone call and the items we discussed for the nomination of the Carson Steel Barn. The significance of the barn appears to lie within the combination of the Scribe Rule and Square Rule methods of Timber Framing. The initial c.1831 construction of the barn and the c. 1868 enlargement of barn are both significant as they reflect a transitional period in Ross County and Ohio's history as the state developed. The nomination should discuss each type of construction, how it is unique to that area, and provide a comparative analysis to other barn types during the period of significance and extant ones. Place the construction and transition of construction methods into the greater context of settlement and growth in this area in the mid-nineteenth century. I am working on tracking down some of our office research on Barns in Ohio. When I find more information, I will send it your way! I am going to follow up this email with a list of other barn nominations that our technical reviewer put together for you.

Please let me know if you have any questions!
Abby

Abby Marshall |Survey & National Register Manager
State Historic Preservation Office | Ohio History Connection
800 E. 17th Ave. Columbus, OH 43211-2474
amarshall@ohiohistory.org

From: Debbie Sheals <debsheals@gmail.com>
Sent: Monday, May 6, 2024 11:49 AM
To: Abby Marshall <amarshall@ohiohistory.org>
Subject: Re: Carson Steel Barn

You don't often get email from debsheals@gmail.com. Learn why this is important

Good Moring Abby,
Would you have some time this week for a phone call to discuss a possible nomination for the Carson Steel Barn? I have written scores of nominations but none in Ohio and I'd like to get a feel for your process. I'd also like to discuss your thoughts on the best way way to approach a nomination for this barn.

I have a pretty flexible schedule this week--is there a day and time that would work for you?

thanks
Deb Sheals
Building Preservation, LLC
573-874-3779
29 South Ninth St., Suite 210
Columbia, MO 65201
buildingpreservationllc.com

On Thu, Mar 28, 2024 at 9:02 AM Abby Marshall <amarshall@ohiohistory.org> wrote:

> Hi Debbie,
>
> Thank you for your interest in the National Register of Historic Places and for your submission of the Preliminary National Register Questionnaire for the Carson Steel Barn. It appears the property qualifies for nomination to the National Register of Historic Places under Criteria C. Please see the attached letter for more information. Let me know if you have any questions.
>
> Have a great day!
> Abby
>
> Abby Marshall |Survey & National Register Manager
> State Historic Preservation Office | Ohio History Connection
> 800 E. 17th Ave. Columbus, OH 43211-2474
> amarshall@ohiohistory.org

Barn-OHI Manual.pdf
6859K

State Historic Preservation Office

3-7-2024 to Ohio SHPO

National Register of Historic Places
Preliminary Questionnaire Individual Property Form

This questionnaire is designed to help us help you determine whether a property is likely to qualify for nomination in the National Register of Historic Places. **Please note that this form provides preliminary evaluation and does not constitute a National Register nomination**. To nominate archaeological sites in the National Register, contact the Archaeology Survey and Data Manager at the State Historic Preservation Office, (614) 298-2000. For all other properties, complete steps 1-7, and then return this form to the State Historic Preservation Office. To submit information regarding a potential **historic district**, please complete the **National Register of Historic Places Preliminary Questionnaire Historic District Form.**

Step 1: Answer These Questions

Is your property at least 50 years old?

☒ Yes ☐ No

Does it still have historical integrity (important aspects of its original appearance and character)?

☒ Yes ☐ No

Is it significant in local, state, or national history?

☒ Yes ☐ No

If your answer to one or more of the above questions is no, the property is unlikely to be eligible for listing on the National Register of Historic Places, and you do not need to fill out the rest of this form.

If you answered yes to all three questions, go to Step 2.

Step 2: Tell Us About The Property

1. In what county is it located?

   Ross County

2. What is the property's address?

Street Address 4100 Block of Sulphur Lick Road
Hopewell Mound Group,
Hopewell Culture National Historical Park

City Chillicothe State Ohio Zip Code 45601

3. What is the name and address of the owner?

Street Address Hopewell Culture National Historical Park
Chris Alford, Superintendent
16062 State Route 104
Chillicothe, OH 45601

City

4. If you're not the owner, have you been in contact with the owner?

   Yes.

5. Briefly describe the structure(s).

   See Continuation Pages.

6. Draw the floor plan.

See Attachment 1.

First Floor

See Attachment 2.

Second Floor or Typical Upper Floor

Step 3: Pick One Reason Why the Property Should Be Listed on the National Register – A, B, C, or D. Answer the Questions In That Box, Then Go On to Step 4

A property can be listed on the National Register of Historic Places for one of four reasons or criteria. Of the following criteria – A, B, C, or D – which one best describes the property? Complete the questions inside one of the boxes (A, B, C, or D) then go on to Step 4.

Criterion

A

The property is associated with events that have made a significant contribution to the broad patterns of our history.

Example: A building that played an important role in the history of transportation in your community.

How did the pattern of events associated with the property contribute to the development of the community?

Go to Step 4

The property is associated with the life of a person or people important in our past at the local, state, or national level.

Example: The only remaining house of the founder of a company important in your community.

or

Criterion

B

With what important person or people is this property associated?

What makes this person or these people important in local, state, or national history?

Who built the property?

William Carson owned the property when the barn was constructed.

During what time period did this person or these people gain importance?

What was its original function?

The original section appears to have served as a multi function barn when new, and the enlarged barn included a threshing floor and room for animals.

How is its history associated with major historical developments in the community?

What was the property's association with this person or these people during this time period? (examples: home, business, school, etc.)

Go to Step 4

or

Criterion

C

The property has the distinctive characteristics of a type, period, or method of construction, represents the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction (e.g. a historic district).

Example: The only example of a Gothic Revival style house.

What architectural style, building type or method of construction does the property represent?

This barn features an unusual combination of Scribe Rule and Square Rule methods of timber framing.

What are the distinctive features of the property that are associated with this architectural style, building type, or method of construction?

The Scribe Rule method of timber framing was in use from the 1200s to the early 1800s, and the Square Rule method became popular in the early 1800s. This barn was built during the transitional period and it provides a good example of both framing techniques. **See continuation sheets for additional information.**

Go to Step 4

or Criterion **D**

The property has yielded, or may be likely to yield, information important in prehistory or history. This criterion typically applies to archaeological sites.

Example: An archaeological site that offers information about the lifeways of previous cultures.

In order to list archaeological sites in the National Register, contract the Archaeological Manager at the Ohio Historic Preservation Office, (614) 298-2000

Go to Step 4

Step 4: Tell Us About The Property's History

1. How many structures are there on the property? When, to the best of your knowledge, was each one built? The Scribe Rule Barn was probably part of a small farmstead when it was built ca. 1831. No other buildings known to have been associated with it have survived. Today, it is part of the Hopewell Mound Group, of the Hopewell Culture National Historical Park.
2. What changes have been made to the building(s), and, if you know, when did they occur? (examples: additions, new windows, siding, roof, etc.)
   The barn was built ca. 1831 and expanded to its current size and shape ca. 1868. A threshing floor in the center bay may have been added in the early to mid-1800s. The exterior siding may date to the 1860s.
3. What are the names of the original and subsequent people or business(es) that occupied the property? Include the dates when they occupied the property, if you know.

   See continuation pages for a chain of ownership.
4. If the property represents the work of an architect, builder, designer, or artist, whose work is it?

   The initials "MA" are inscribed into the 1830s framing members, presumably by the builder. Census records show a Mahlon Anderson living nearby in 1830, but he has not been definitively tied to the barn's construction.
5. Where have you found historical information about this property? (examples: city or county records, newspaper articles, books, etc.)

   See continuation pages for list of sources.

Step 5: Answer These Questions About the Property's Condition

1. Is the property on its original site?

   Yes
2. What are the important features of its setting? Are they intact?

   Now a part of the Hopewell Mounds National Historical Park, the land around the barn retains a rural/agricultural character. Cultivated fields in the creek bottoms south of the barn and a small farmstead east of it continue the historic pattern of agricultural land use. Parkland to the north, which once contained cultivated fields, is now open grassland.
3. What major historic materials does the property retain? (examples: wood siding, slate shingles, decorative trim)

   The barn retains its original timber frame, and the current roofing and exterior siding appear to be well over 100 years old. (See description on the continuation pages for more information on materials and age.)
4. Have any major historic materials been removed or covered with asbestos, aluminum, or vinyl siding?

   Small sections of the roof and the exterior walls have recently been covered with modern materials to stabilize the building and make it weather tight.
5. Does the property retain the major features of its design and function such as the basic shape, room arrangements, and window and door openings?

   Yes, the barn retains all or most historic character-defining features, including roofing, exterior siding, and its heavy timber frame. The exterior form and interior layout of the barn today are little changed.

Step 6: Take These Photos

Enclose the following photos of the property as it looks today. Please label the photographs. Recent color snapshots are fine.

Outside
- ☑ Front
- ☑ Sides
- ☑ Back

Inside
- ☑ Pictures of the main rooms or public spaces, such as the Hall, Living Room, Dining Room, Lobby, Ballroom, Auditorium, Classroom, and any distinctive or significant architectural features, such as fireplaces, woodwork, stairways and door or window surrounds.

Old Photographs
- ☑ If you have photographs that show how this property looked at an earlier time, sending photocopies may help us better advise you on its National Register eligibility. Please do not send original historic photos.

Additional photos may help us better help you. If the property has any of the following features, or other features you think are interesting, consider sending photos of them, as well:

- ☐ Front Door and Door Frame
- ☐ Window and Window Frame
- ☐ Ornamental Details
- ☐ Cornerstone
- ☐ Stained Glass
- ☑ Barns, Stables, Outbuildings
- ☐ Iron, Wire, or Wooden Fences
- ☐ Gardens, Terraces, Setting
- ☐ Ornamental Plaster
- ☐ Old Lighting Fixtures
- ☐ Vintage Equipment
- ☐ Tower, Steeple, Dome
- ☐ Old or New Alterations
- ☐ Staircases
- ☐ Mantels
- ☐ Fine Woodwork

The online instructions seem to limit photo files to five, but I would be happy to supply additional views of any and all parts of the building.

Step 7: Send Us Your Completed Questionnaire

Please do not put questionnaire in folder or binder

State Historic Preservation Office
800 E. 17th Avenue
Columbus, OH 43211-2474

After looking over your questionnaire, we'll contact you to let you know whether the property appears to be eligible for nomination to the National Register or not. **If the property appears to qualify, the next step would be the completion of the National Register of Historic Places nomination form.** Please give us the address at which you'd like to be contacted.

Name Debbie Sheals

Address 29 South Ninth St. Ste 210

City Columbia State MO Zip Code 65201

Phone (573) 874-3779 FAX (____) _____

E-Mail Address: Debsheals@gmail.com

Step 2:

5. Description

The Carson-Steel Barn is a heavy-timber framed barn that was built ca. 1831 for William Carson and enlarged to its current form for Johanna Steel ca. 1868.[1] The 1830s core of the barn has a roughly square footprint, with a high gable roof. (See Attachments 1 and 2, floor plan and section view.) The lower 1860s addition wraps around three sides of the original building. The addition has a hipped roof along the back (west) wall of the original section and shed roofs to the north and south. All sections of roof have standing seam roofing that appears to have been in place since at least 1922. (See Attachments 4 and 5, current and historic photos.) A few sections of roofing have been replaced in recent years. (See Photo 2.) The foundation consists of widely spaced early or original stones, with a few areas of poured concrete and brick that were added later.

All exterior walls are sheathed with wide vertical planks that are painted white. Each plank has a central V-shaped vertical groove; the planks are set close together, with no battens. The sheathing is intact and in generally fair to poor condition. A few areas are in very poor shape, and there is a large modern plywood patch next to the south doorway on the front wall. Because the exterior wall planks are the same in the 1830s and 1860s parts of the barn, it is likely that all wall sheathing was added at the same time, possibly when the barn was expanded ca. 1868.

The barn occupies an open level site at the south edge of the Great Enclosure of the Hopewell Mound Group. (See Attachment 3.) It is roughly 180 feet south of Sulphur Lick Road. The Tri-County Triangle Recreation Trail runs between the barn and the road, near the south side of the road. The barn is surrounded by mowed grass fields on three sides, with a tree line close to its south wall. The tree line is at the edge of a short hillside that slopes down to the creek bottoms of the North Fork of Paint Creek. The bottom land is covered with a corn field. There is a modern (ca. 1980s) house approximately 300 feet east of the barn; it replaced an older house between 1984 and 1995.[2] When new, the barn was part of a 250 acre farm. (See Attachment 7.)

The barn faces east, with three doorways on its front (east) wall. (Photo 1.) Each side bay has a wagon-sized doorway that is covered with a modern plywood door. The central bay of the east wall has a pedestrian sized doorway that also has a modern plywood door. The pedestrian doorway sits about two feet above grade, with a short flight of wooden steps. The wall above it contains modern painted plywood patches, and recently installed plywood infill of what appears to have been a hay door at one point. (Photos 1 and 3.)

The north side wall of the barn has one small window opening that has no frame or sash. The window opening was added after 1922. A wagon-sized sliding door at the west end of that side wall appears to have been added later, but it is constructed of the same type of grooved siding

[1] Construction dates for the two sections have been determined via testing of the structural members by an expert in dendrochronology. The testing showed that the trees used for the Carson-Steel Barn died in 1830 (for the core) and 1867 (for the additions). Therefore, it is likely the different sections of the barn were built within a year of the respective tree harvests. Nick Wiesenberg, Geology Technician, the College of Wooster, email to Angie Gaebler, STRATA Architecture, Nov. 3, 2023.
[2] 1984 and 1995 aerial photos, on *Vintage Aerial*, accessed February 20, 2024.



used elsewhere. There is another small frameless window opening on the back (west) wall. The south side wall, which is in very poor condition, has no doors or windows. (Inset photo right, south side wall. STRATA Architecture 2023.)



The original heavy timber framing system, which is exposed inside the barn, features hand-hewn timbers put together with two different timber framing methods that were in use in the early 1800s. The original section of the barn was constructed using the Scribe Rule method. (See significance section below for more information about framing techniques.) Scribe Rule framing is easily identified by Roman numeral marks that were chiseled into the wood by the builders to ensure timbers were correctly matched for specific joints. (See Photo 4, of joint number 3.) The builder of this barn also used that same type of chisel to add the letters “M A”, presumably his initials. (Inset photo right, presumed builder’s mark in the 1830s section of the barn. Deb Sheals 2023.)



The 1860s addition to the barn also uses heavy timber framing, but those walls were constructed using slightly simpler joinery created by the Square Rule method. (See photo 5.) Square Rule framing is like Scribe Rule in that it features heavy timbers connected with pegged mortise and tenon joints but differs in that many of the timbers are cut to be interchangeable. That difference eliminated the need to mark the timbers. Square Rule joints also tend to have a less exact fit. (Inset photo right: Square Rule joint in the 1860s portion of the barn. Photo by Deb Sheals 2023.)



The 1830s section of the barn is just over 22 feet tall at the roof ridge, with no evidence of having had an intermediary loft. (See Photo 3 and Attachment 2, Section View.) That section has a raised wood floor constructed of tightly placed 2” thick planks that supported by heavy joists that are pocketed into hewn timber sills. (Inset photo right, looking north into the original section of the barn. STRATA Architecture 2023.) That floor is edged with short walls made of wide flat vertical boards. The raised flooring and side walls appear to have been added at an early date (possibly the 1860s) to create a threshing floor.

The 1860s addition wraps around three sides of the original barn. That part of the barn has lower ceilings (about 8 feet) topped by lofts that appear to be historic. (See Attachment 2, section view of barn.) Those areas have generally open floorplans, with a few stalls and feeding racks that show the barn housed animals for at least part of its history. (See Photo 5.) The south bay of the addition has a concrete floor, and the west and north bays have dirt floors. (Inset photo below, south bay of the addition, looking east. Photo by Strata Architecture 2023.)

The Carson-Steel barn is notably intact, but in poor condition overall. Although most framing is solid, sustained water incursion has caused serious deterioration along the west wall of the original section. The original west supports are rotted and in need of immediate stabilization. Exterior siding is also intact, but in poor condition, particularly along the bottom edges of the boards.



Step 3.

Summary Statement of Significance

The Carson-Steel Barn in Union Township, Ross County, Ohio, is locally significant under Criterion C, in the area of Architecture. Built just a few decades after Ohio became a state, it features distinctive characteristics of two different methods of heavy timber framing that were in use at the time. It is a good example of both Scribe Rule and Square Rule timber-framing. The Scribe Rule method of timber framing, which required the services of at least one master carpenter, developed in England and Europe in the 1200s and was used in the American colonies and the United States into the first half of the 1800s. The less technical Square Rule method developed in the United States around 1800, and by the mid-1800s, it had almost completely replaced Scribe Rule. The Carson-Steel barn was built during that transitional period, and it provides a good example of both framing techniques. Most of the connections in the original part of the barn, constructed ca. 1831, utilize Scribe Rule joinery, identified by distinctive builder's marks and tight fitting joints. When the barn was expanded to its current form ca. 1868, the builders used the Square Rule method. The combination of those distinctive construction techniques in the Carson-Steel barn reflects the evolution of timber framing practices that were common in the first half of the 19th century, before the development of dimensional lumber.

Elaboration

Timber Framing Methods

When the oldest section of the Cason-Steel barn was built, timber was plentiful, but sawmills were extremely rare in Ross County, and builders had to fashion all or most components for a wooden building with hand tools.[3] That process began with felling trees, using a felling axe,

[3] The first known water powered sawmill in Ross County was placed in service in 1798, but it was destroyed by floods a few years later. Circular saws did not come into widespread use in the United States until the late 1820s or early 1830s. See Donald A. Hutslar, "Ohio History Journal: Ohio Water Powered Saw Mills," *Ohio History Connection*, accessed September 18th, 2023, https://resources.ohiohistory.org/ohj/search/display.php?page=116&ipp=20&searchterm=Array&vol=84&pages=5-56, 10.



which resembled the modern-day American axe. Once the felled tree was trimmed and its branches removed, logs were cut into useable lengths, and the builder(s) used a string line to mark a straight line for the edge of the finished timber. Angled scoring cuts were then made along the string line. Using a broad axe, which is offset to one-side, the builder shaved or "hewed" a flat side into the log, chopping the score marks away and creating a straight edge matching the string line. That process was done four times to create a square or rectangular timber. Scoring marks from that process can still be seen on many of the Carson-Steel barn's framing timbers. (Inset photo right: framing in the 1867 section of the barn. STRATA architecture 2023.)

Once the timbers were squared, they were ready to be cut and assembled, using mortise and tenon joints secured by wooden pegs. A mortise is a hole cut into a timber to receive a tenon. A tenon is a projecting end of a piece of wood cut to fit into a mortise.[4] Scribe Rule and Square Rule both use mortise and tenon joints, the primary difference between the two lies in the way those joints are designed and assembled.

Timber Framing

Using large timbers to create a substantial shelter for protection against the elements and one's enemies is estimated to have begun around 200 BCE in Europe and the Far East.[5] By the Middle Ages, England and Europe had well-developed carpentry guild systems that supported technological advances and formal training for tradesmen. That training took years. It began with a five- to seven-year unpaid apprenticeship under a master craftsman, after which the trainee could work as a traveling journeyman. The guilds then controlled which journeymen could be designated as master craftsman, a title that brought the ability to own tools and operate a carpentry business.[6]

Master builders had expertise in all aspects of timber construction that ranged from small dwellings and outbuildings to the vaulted roofs of major cathedrals. Expertise in joinery was critical, as builders had to splice together smaller pieces of wood into large framing members and create structurally secure connections between irregularly shaped timbers. The master builder was generally in charge of mapping joints and scribing timbers to mark the angles and locations of cuts. After that step, less skilled apprentices and journeymen could cut the timbers and assemble the frames. Scribe Rule, as that system became known, was used in England

[4] Cyril M. Harris, *Dictionary of Architecture and Construction 4th ed.* (New York: McGraw Hill, 2006), 644, 986.
[5] Tedd Benson and James Gruber, *Building the Timber Frame House: Revival of a Forgotten Craft*, (New York: Charles Scribner's Sons, 1980), 2.
[6] David Leviatin, "Scribe Rule, Square Rule, Democracy and CNC," *Journal of the Timber Framers Guild,* no. 102 (2011): 3.

and Europe as early as 1200 CE and it was still followed in England and the United States in the 1850s.[7]

The guild system was still in place when the American colonies were being established, but it did not transfer to the new settlements. Few master carpenters were willing to give up established practices to emigrate, and the first carpenters to settle in America tended to be young men who were relatively new to the field. The carpentry trade in America developed in a more haphazard manner, with fewer master builders and little to no system for formal training. The Scribe Rule method did transfer, though, and skilled builders that could apply Scribe Rule principles were still in demand in the early 1800s.

As was the case in England and Europe, Scribe Rule construction in the United States required the services of at least one master craftsman, who designed and marked each joint in the framework. That was done by laying out the timbers on the ground in the shape in which they were to be assembled, then mapping the face of each, using a string line, caliper, and plumb bob. (Inset Image from "Timber Framing for Beginners: Introduction to Scribing 1." *Timber Framing*, No 76, June 2005, 5.) That process sometimes required putting together and taking apart the heavy timber frame multiple times prior to assembly to design all joints in the building.[8] Mortises and tenons were created in the corresponding timbers to create a precise fit, no matter the shape of the timbers being joined. Because each scribed joint was different, those framing members were not interchangeable; each joint was unique. Therefore, the timbers were marked with Roman numeral "marriage marks" as the joints were created, and the joints were then disassembled so that the members for the next joint could be scribed and cut.

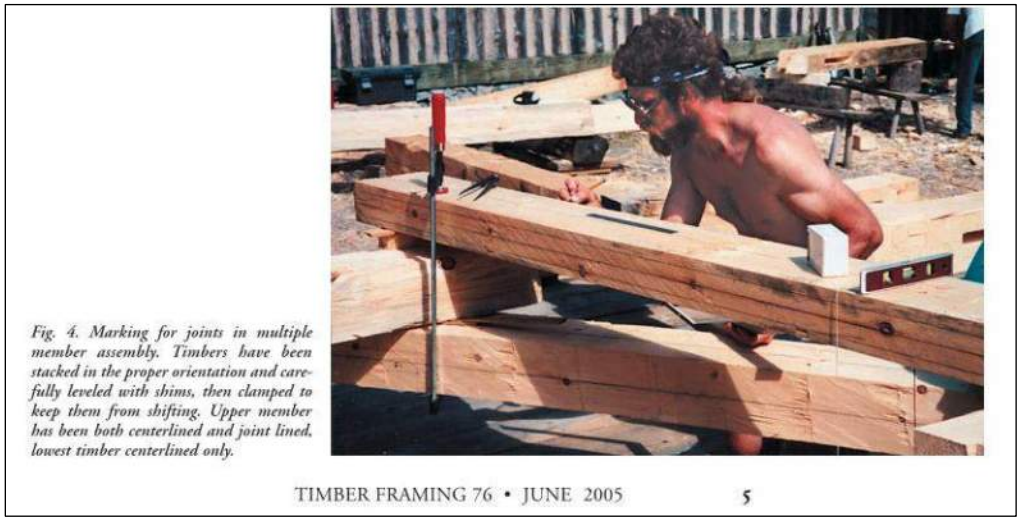


Fig. 4. Marking for joints in multiple member assembly. Timbers have been stacked in the proper orientation and carefully leveled with shims, then clamped to keep them from shifting. Upper member has been both centerlined and joint lined, lowest timber centerlined only.

TIMBER FRAMING 76 • JUNE 2005 5

The tight joints and marriage marks on the timbers of the original section of the Carson Steel mark it as a product of the Scribe Rule method. It was designed by a master builder familiar with what one description of early timber framing in the United States called "a highly complex and

[7] Allison Aurand, "Timber Framing's Legacy: The History of This Iconic Style," *Timber Home Living,* accessed December 8, 2023, https://www.timberhomeliving.com/articles/history-of-timber-framing; Edward Shaw, *Shaw's Civil Architecture; Being a Complete Theoretical and Practical System of Building*, (Boston: John P. Jewett and Company, 1952), 116.

[8] Jack A. Sobon, *Historic American Timber Joinery: A Graphic Guide*, (Becket, MA: Timber Framers Guild, 2002), accessed September 2023, https://www.nps.gov/subjects/ncptt/upload/II-Tie-at-Plate.pdf, 3; Aurand, "Timber Framing's Legacy"; Shaw, *Shaw's Civil Architecture,* 116.

sophisticated array of structural concepts, climaxing a thousand years of English experience in building."[9]

Although the master builder of the original Carson-Steel barn has not been positively identified that person left a solid clue to his identity. The initials "MA" are chiseled into the 1830s framing members, presumably by the builder. A review of local census records and county histories identified two men with the initials M. A. that lived in the area and were of the correct age to have worked on the barn. They were father and son. Mahlon Anderson, Sr. (1771-1843) moved to Union Township in 1806, and the Anderson family owned land in the area in the early twentieth century.[10] His son Mahlon Anderson, Jr. was born in 1809. When the barn was built, the elder man was about 60, and his son was 22. If they were involved in the construction, it is likely that the elder Mahlon Anderson was the master builder, but his son may have worked on it as well.

Square Rule

Around the turn of the nineteenth century, a new timber framing method developed in the United States. Known as the Square Rule, it is a less technical method based on the principle that every piece of timber has a straight piece of smaller dimensions within the irregular timber. Only the connection points of the framing members are trimmed to those dimensions. Because all timbers for a single building could be trimmed to uniform dimensions, there was no need to design custom joints and scribe framing members. As a result, Square Rule allowed for faster installation of the timber frames and lessened the need to learn overly technical construction methods. One modern description of Square Rule listed numerous advantages over Scribe Rule: "Many similar parts of a frame, braces for example, are interchangeable…Timbers do not need to be stacked on top of each other, scribed joints are eliminated, the frame does not need to be put together and taken apart before being erected…the speed of the entire framing process is increased dramatically."[11]

Square Rule has been described by historians as an American innovation born of necessity. American colonists had been plagued by a shortage of experienced master builders since the earliest days of settlement. There was, for example only, one carpenter on the *Mayflower*, and in 1629, a British colonist wrote home that "Of all the trades, carpenters are most needful: therefore, bring as many as you can."[12] With few opportunities for formal training in the colonies, and limited immigration of trained joiners, that shortage continued through the 1700s.[13] Historian David Leviatin noted that "Without enough master carpenters…the young (American) carpenters moved away from methods over which they had little grasp and developed new and more effective ones that enabled them to build well-made houses, barns and churches quickly."[14]

Square Rule gradually became the standard for heavy timber framing in the United States, and by the mid-1800s had nearly supplanted Scribe Rule.[15] The two methods coexisted for much of the early 1800s, however. The "Framing" discussion for a builder's guide published in Boston in

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[9] Leviatin, "Scribe Rule, Square Rule," 2-6.
[10] Lyle S. Evans, *A Standard History of Ross County, Ohio* (Lewis Publishing Company: Chicago and New York, 1917), 612.
[11] Leviatin, "Scribe Rule, Square Rule," 4.
[12] Leviatin, "Scribe Rule, Square Rule," 3.
[13] Leviatin, "Scribe Rule, Square Rule," 4.
[14] Leviatin, "Scribe Rule, Square Rule," 4.
[15] Leviatin, "Scribe Rule, Square Rule," 4.

1852, for example, began with an explanation that "This mechanical science is divided into two principles—the Scribe Rule and the Square Rule."[16] The relative complexity of the two methods is evident in the text that follows that statement: the description of Scribe Rule is almost three times as long as the one for Square Rule.

The Square Rule method of framing was used for the 1860s additions to the Carson-Steel barn. The framing in that part of the barn does not have marriage marks, and the joints are more irregular. (Photo 5.) There is also evidence that the builders of the original part of the barn were aware of Square Rule principles. At least one joint in the 1830s section is more typical of Square Rule than Scribe Rule.[17] Historic barn expert Rudy R. Christian observed in a 2014 report on the Carson-Steel barn that such a combination of joinery techniques in a single structure is very unusual for the area. He noted that the blend of methods provides "evidence that the (original) timber framer was aware of and willing to try the modern square rule system of joinery layout."[18]

In the end, that "modern system of joinery" was much shorter lived than Scribe Rule. With the proliferation of commercial sawmills and mass produced nails, within a few decades of the barn's expansion, heavy timber framing began to be replaced with methods that used dimensional lumber. Rudy Christian noted in 2002 "Though heavy frame timber construction has been used for nearly two thousand years, it all but vanished in this country shortly after World War 1."[19] That transition began with houses but eventually applied to barns as well. The shift was aided in Ohio by a series of articles in the *Ohio Farmer* that promoted new barn building techniques featuring smaller sawn structural members and more open interior spaces.[20] The iconic gambrel-roofed barn form is a product of that movement, which included the development of truss systems for gambrel roofs that were fashioned entirely from dimensional lumber.

The Carson-Steel Barn offers a rare physical snapshot of early American timber framing practices in transition from Old World craftmanship to modern light frame construction. It meets requirements for listing under Criterion C, which "applies to properties significant for their physical design and construction," and which "embody distinctive characteristics of a type, period, or method of construction."[21]

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[16] Shaw, *Shaw's Civil Architecture,* 116.

[17] Rudy R. Christian, Memo to Sam Quackenbush, Hopewell Culture National Historical Park, Re: Scribe Rule Barn (Carson-Steel Barn), April 2014.

[18] Christian, Memo to Sam Quakenbush, 3.

[19] Rudy R. Christian, "Conservation of Historic Building-Trades Education: A Timber Framer's View." *The Journal of Preservation Technology* 33, no. 1 (2002).

[20] Lowell J. Soike, "Within the Reach of All: Midwest Barns Perfected," in *Barns of the Midwest*, (Columbus: Ohio University Press, 2018),147-148.

[21] *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (Washington D.C. :US Department of the Interior, National Park Service, n.d.), 17.

Step 4: Question 3.

Chain of Ownership

1796 Nathaniel Massie is granted 750-acre Virginia Military Survey (VMS) tract 2531, which includes the Scribe Rule Barn property. [Original VMS Survey Records, Ross County Recorder's Office.]

1798 Joseph Darlington buys the land from Massie. [Ross County Recorder, Deed Book 13, p. 417.]

1814 Jeremiah Ashbee (Ashby) buys 400 acres from Joseph Darlington for $4,000. [Ross County Recorder, Deed Book 13, p. 477.]

1829 Jeremiah Ashby sells William Carson 250 acres of the Darlington parcel for $1800. That parcel includes the barn site. [Ross County Recorder, Deed Book 24, p. 141.]

1831 ca. The first section of the barn is constructed by or for Wilam Carson. [Dendrochronology]

1833 William Carson sells the land he bought from Ashby in 1829 to William C. Clark. 250 acres for $3200. The jump in value no doubt reflects construction of the barn and other improvements to the property. [Ross County Recorder, Deed Book 27, p. 309.]

1848 William Clark dies, and his land is passed to his wife Sarah and two daughters, Caroline, and Johanna, who each own an undivided half interest in the property. [Ross County Probate records.]

1861 William Ghormley and his wife Caroline (nee Clark) sell their undivided half share of the land to Johanna Steel (nee Clark). [Ruby, Hopewell Mound Group Overview, 2015. Personal Files.]

1867, ca. Additions to the barn are constructed by or for Johanna Steel. [Dendrochronology]

1889 Nov. 15. Johanna Steel's heirs sell land totaling 261 acres (256.89 in 2531) to Mordecai Cloud Hopewell for $16,000. [Ross County Deed Records, Deed Book 107, p. 41.]

1938 Ella R. Hopewell, the widow of M. C. Hopewell, dies having no children. Estate executor Walter W. Boulger sells farm to the Accord family. [Chillicothe Gazette (Chillicothe, Ohio), 1938.]

1967-69 Accords sell land to Richard P. Johnson. [Ross County Recorder Deed Book 346, p. 621, and Deed Book 357, p. 95.]

1980 The Archaeological Conservancy purchased Hopewell Mound Group from private landowners Richard and Betsy Johnson. [Ross County Recorder, Deed Book 444, p. 43 and p. 45.]

1992 "Hopewell Culture National Historical Park was established on May 27, 1992." Hopewell Mound Group is part of it. "Hopewell Mound Group: Cultural Landscapes Inventory." Chillicothe Ohio: National Park Service, 2008, 2-61.]

1997 The National Park Service purchased Hopewell Mound Group from the Archaeological Conservancy. [Ross County Recorder, Deed Book 88, p. 405.]

Step 4: Question 5

Historic information on this property has been found through deeds on file at the Ross County Recorder, Ross County real estate tax records, Ross County probate records, published histories of Ross County, various newspapers on Newspapers.com, and previous research on file with the Hopewell Culture National Historical Park, which includes original research conducted by Dr. Timothy Everhart of the National Park Service.

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Ross County Engineers Office, Map Room. Accessed in person October 2023. Original VMS Survey Map.

Ross County Archives. Accessed in person October 2023. Probate Records of William C Clark.

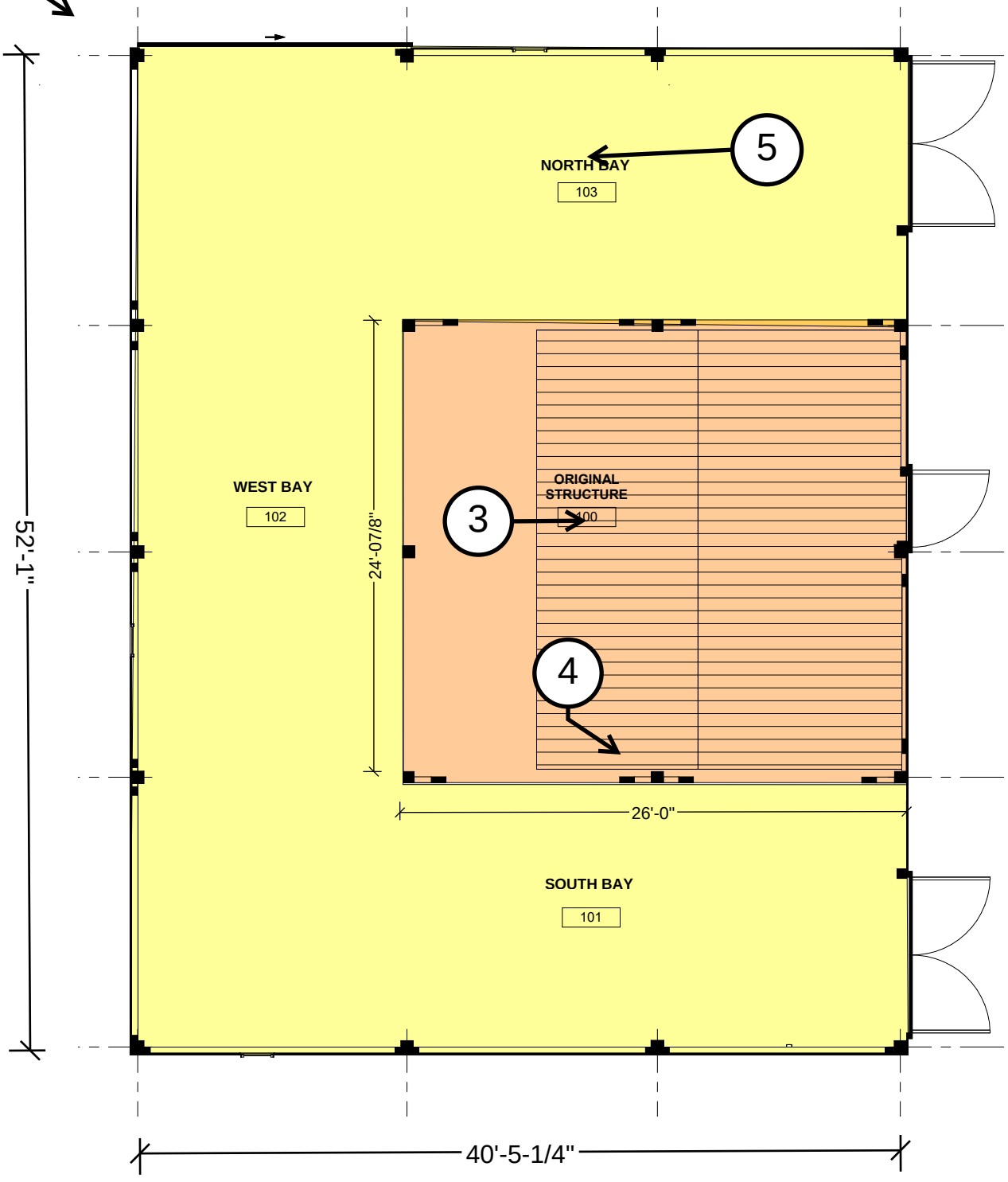
Ross County Records: Deeds. Accessed in person October 2023. Deed Book 13, p. 417; Deed Book 13, p. 477; Deed Book 24, p. 141; Deed Book 27, p. 309; Deed Book 107, p. 41; Deed Book 346, p. 621; Deed Book 357, p. 95; Deed Book 444, p. 43 and p. 45; Deed Book 88, p. 405.

Wiesenberg, Nick. (Geology Technician, the College of Wooster.) Email to Angie Gaebler, STRATA Architecture, Nov. 3, 2023. Longer dendrochronology test report pending.

Photo Below. Looking north from the original core of the barn.



Carson-Steel Barn, Hopewell Mound Group
4100 Block of Sulphur Lick Road
Chillicothe, Ross County, Ohio, 45601



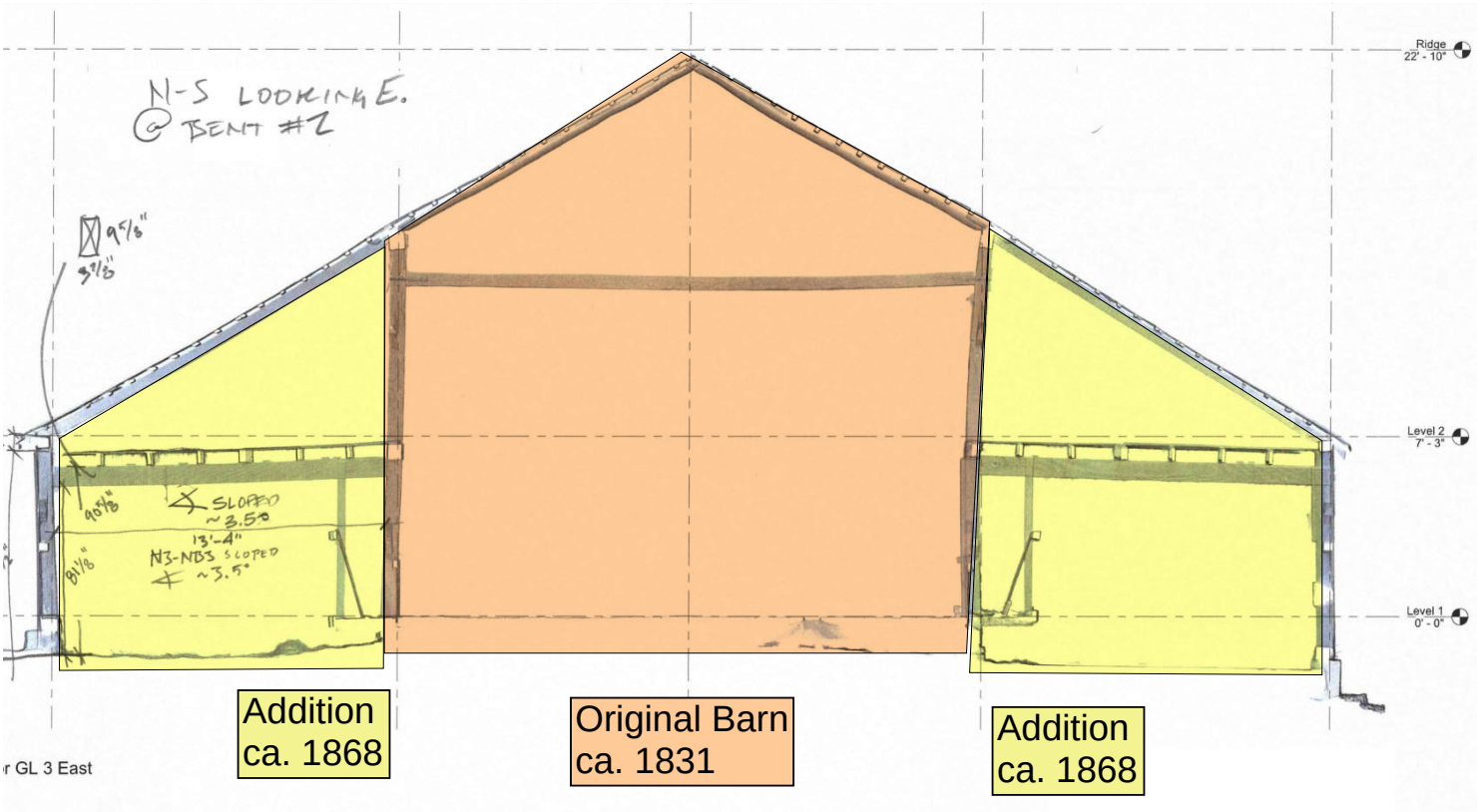
Floor Plan with photo key

STRATA Architecture,
Kansas City, MO 2023

Original Barn built ca. 1831 for William Carson

Addition(s) Constructed ca. 1868 for Johanna Steel.

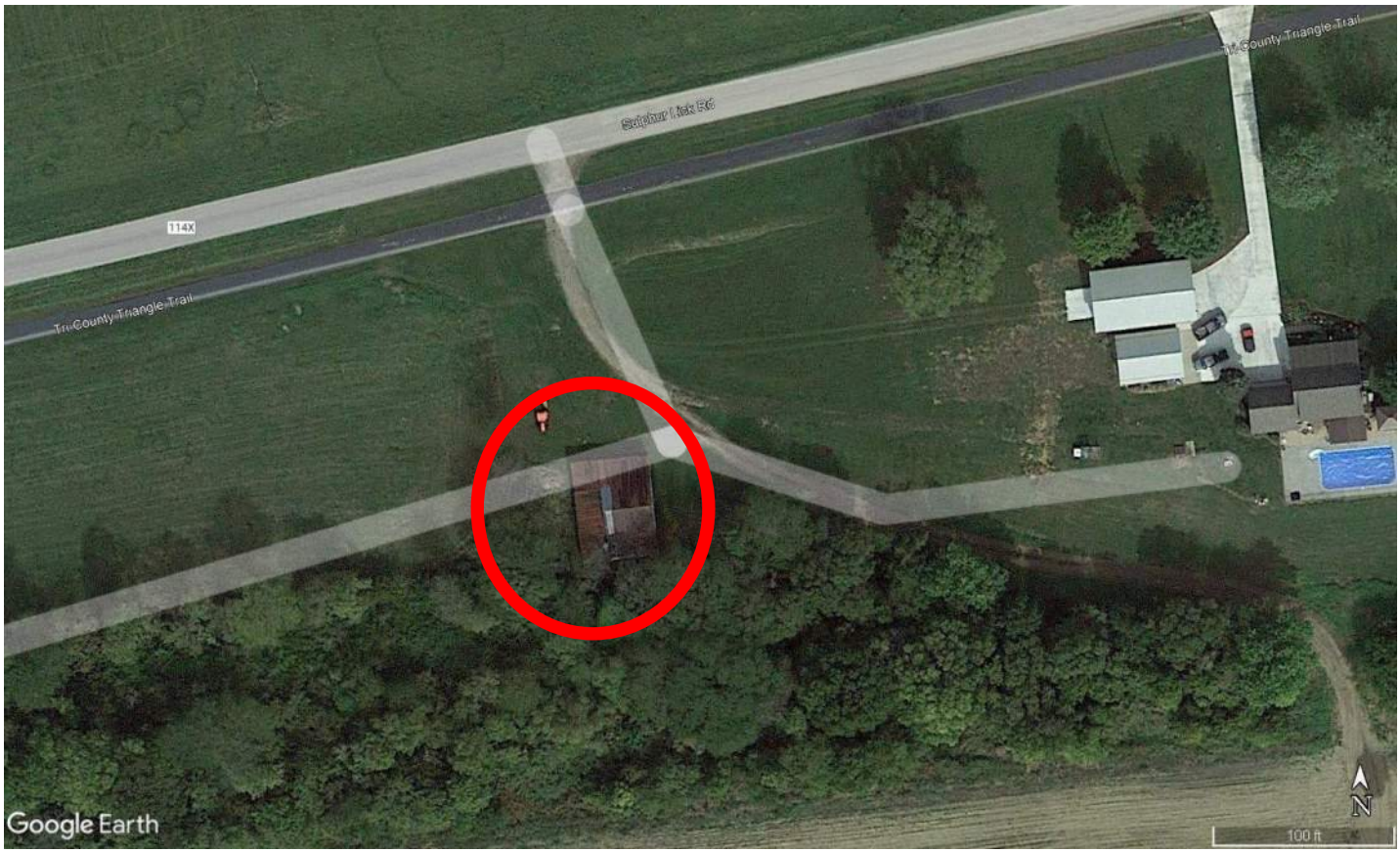
Carson-Steel Barn, Hopewell Mound Group
4100 Block of Sulphur Lick Road
Chillicothe, Ross County, Ohio, 45601



Section View, Looking East
STRATA Architecture, Kansas City, MO 2023

Current Google Earth Views







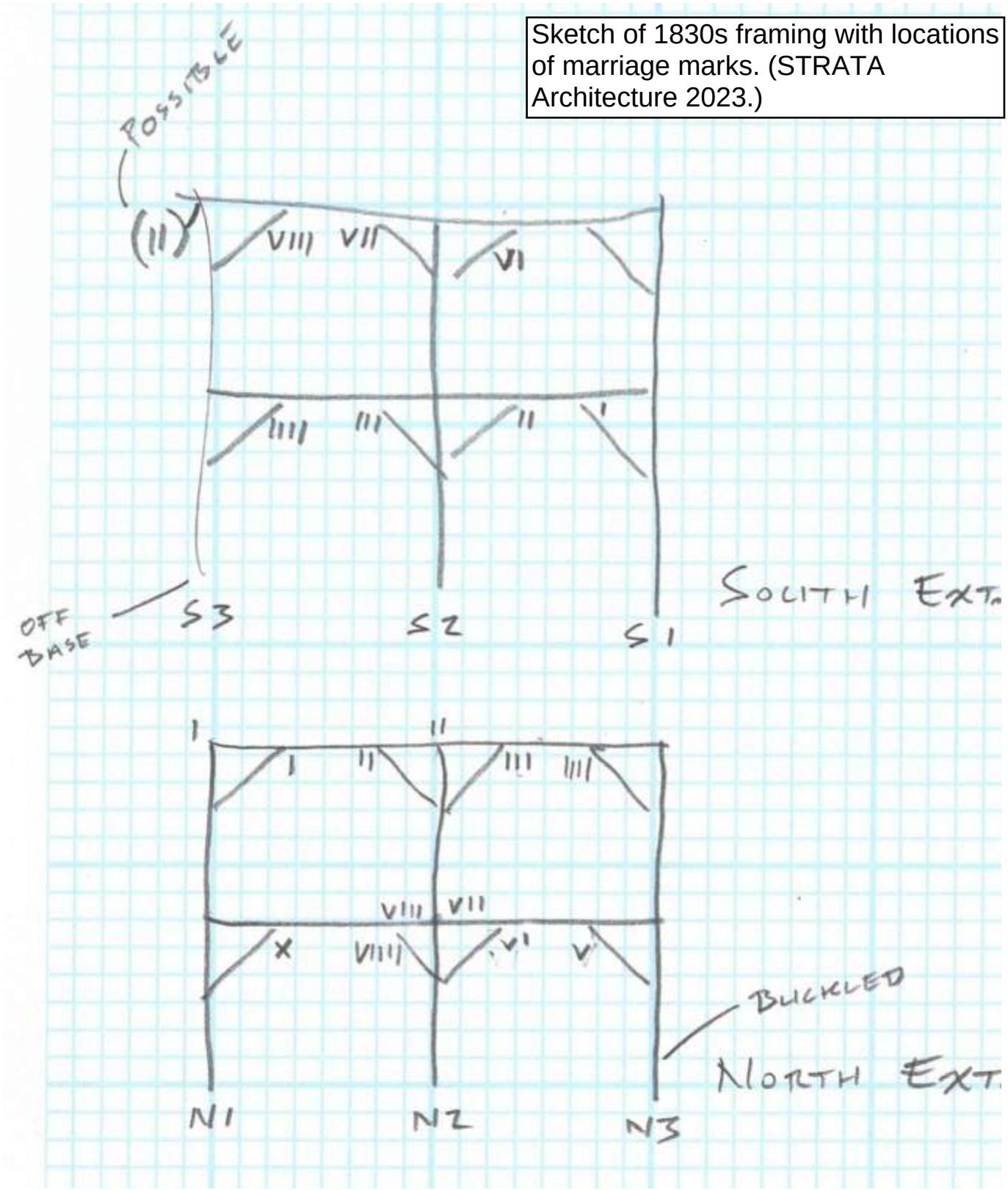
1922 photo by Henry C. Shetrone. (Ohio Historical Society Ohio Memory)



2024 photo by Deb Sheals.



Full image of the 1922 photo by Henry C. Shetrone, looking south across corn fields. This shows the Carson-Steel Barn to the far right, a larger newer barn to the left, and a house behind the trees in the center. (Ohio Historical Society Ohio Memory)



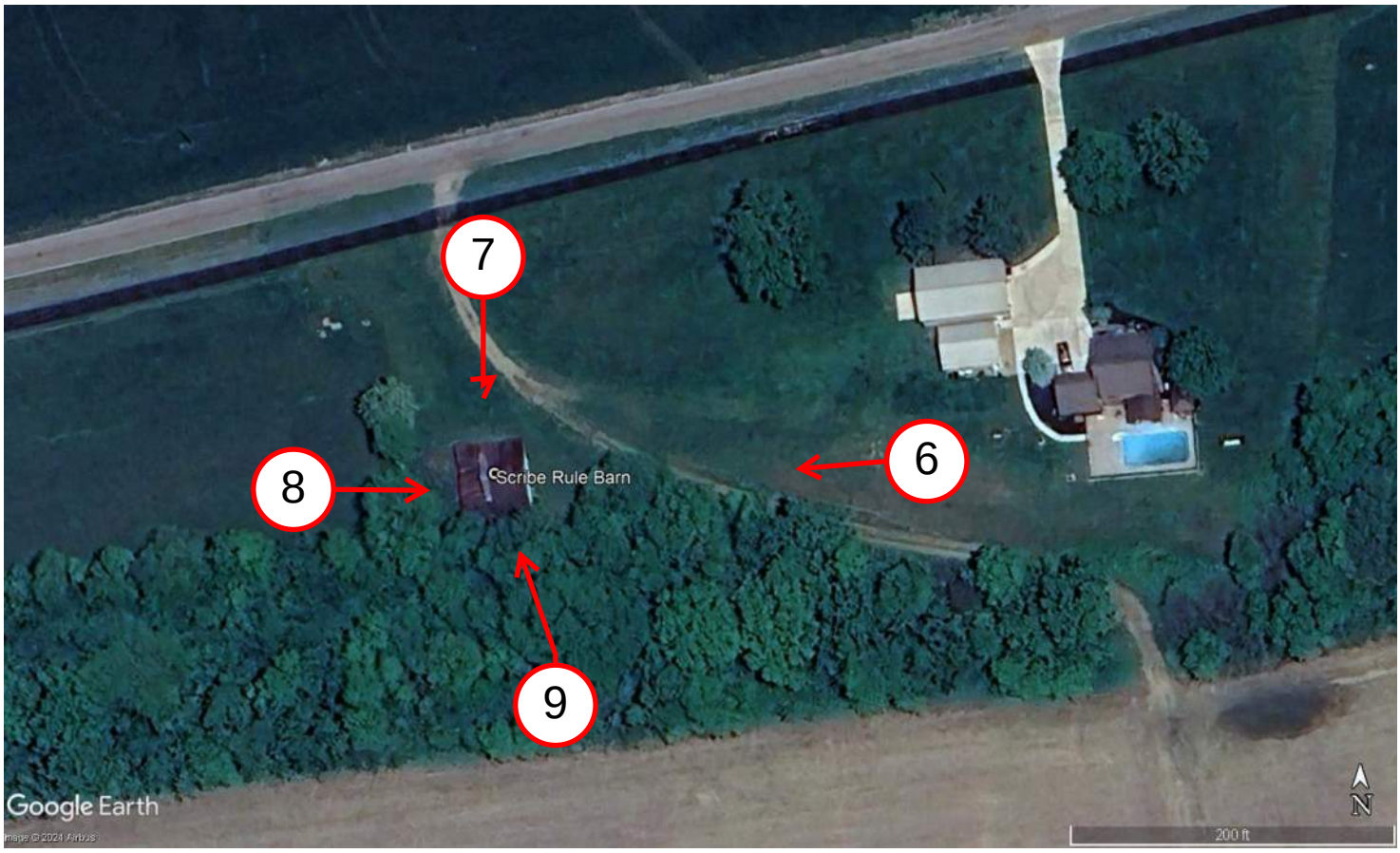
Sketch of 1830s framing with locations of marriage marks. (STRATA Architecture 2023.)

Property Associated with the Carson-Steel Barn in 1860 (top) and 1875 (bottom). The red circles mark the approximate location of the barn.
(Topographical Map of Ross County, Ohio 1860 Library of Congress, and Hueston T. Gould, Illustrated Atlas of Ross County and Chillicothe, Ohio. Columbus, Ohio: H.T. Gould & Co., 1875.)

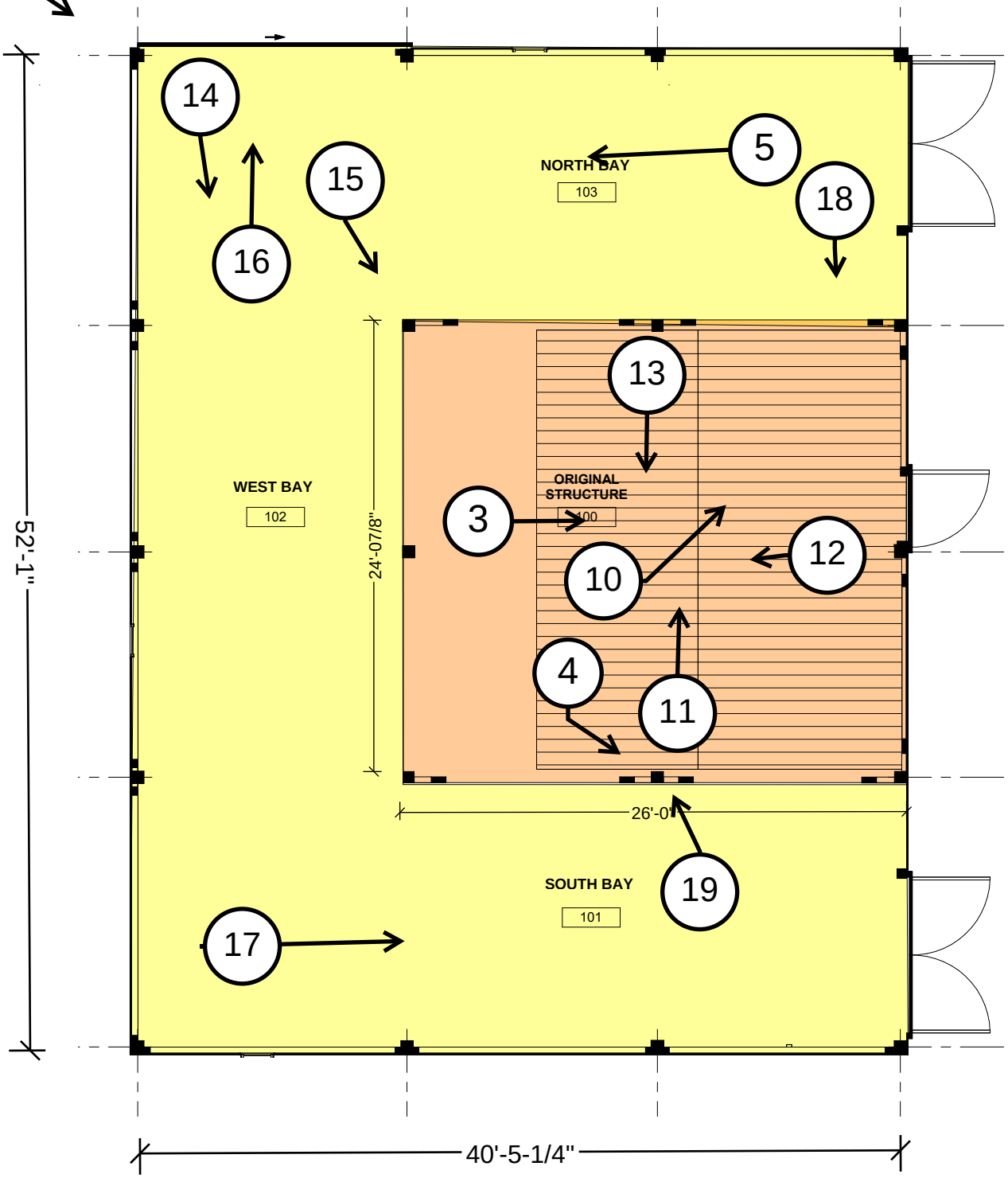




Carson-Steel Barn, Hopewell Mound Group
4100 Block of Sulphur Lick Road
Chillicothe, Ross County, Ohio, 45601



Carson-Steel Barn, Hopewell Mound Group
4100 Block of Sulphur Lick Road
Chillicothe, Ross County, Ohio, 45601



Floor Plan with photo key
STRATA Architecture,
Kansas City, MO 2023

Original Barn built ca. 1831 for William Carson

Addition(s) Constructed ca. 1868 for Johanna Steel.








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DANGER
DO NOT
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DANGER
DO NOT
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