# Bauvais-Amoureux House

**STE. GENEVIEVE NATIONAL HISTORICAL PARK**
**STE. GENEVIEVE, MO**

# Historic Structure Report

**PMIS 311235**
**OCTOBER 2024**

Bauvais-Amoureux House, south facade (Source: RRJ)


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**Bauvais-Amoureux House**
**Historic Structure Report**
Ste. Genevieve National Historical Park
Ste. Genevieve, MO

October 2024

**Prepared for:**

**National Park Service Interior Regions 3, 4, 5**
Omaha, Nebraska

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# Bauvais-Amoureux House
# Historic Structure Report

**Ste. Genevieve National Historical Park**
**Ste. Genevieve, MO**

Contract No. 140P6020D0002
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# Administrative Summary and Data

## Resource Information

The Bauvais-Amoureux House is located at 327 St. Marys Road in Saint Genevieve, Missouri. The home was built in c. 1792 and is among only a few surviving French Colonial vernacular dwellings of this period in the United States. The home is listed on the National Register of Historic Places as a contributing structure to the Ste. Genevieve Historic District and Ste. Genevieve National Historical Park (Ste. Genevieve NHP). The house is currently operated by NPS as a museum. Visitors are allowed limited access to the house interior and surrounding grounds.

| | |
|---|---|
| ***Name:*** | Bauvais-Amoureux House |
| ***Location:*** | Ste. Genevieve National Historical Park<br>327 St. Marys Road, south of downtown Ste. Genevieve, Missouri, and overlooking the Common Field to the east. |
| ***National Register Status:*** | Located within the boundary of the Ste. Genevieve National Historic District (contributing resource no. 93) and the Ste. Genevieve National Historic Landmark District (contributing resource no. 7 of the revised 1970 resource list); not individually listed on the National Register for Historic Places but eligible for individual listing under Criteria A (national level), C (national level), and D (local level). |
| ***Dates of Construction and Major Alterations:*** | c. 1792, original construction<br>c. 1847, galleries and gable ends added<br>c. 1880, length shorted and new west exterior wall constructed<br>c. 1965, north gallery enclosed |
| ***Current Use:*** | Historic house museum |
| ***Overall Dimensions:*** | 51'-1.5" by 46'-4.75” and 31’-2” at roof ridge (including basement) |

| ***Net Areas:*** | | |
|---|---|---|
| | Basement (unoccupied) | 1,410 square feet |
| | First Floor | 1,825 square feet |
| | Attic (unoccupied) | 1,410 square feet |

# Project Purpose and Need

Ste. Genevieve National Historical Park was established as a unit of the National Park Service (NPS) on October 30, 2020. The settlement of Ste. Genevieve was established on the west bank of the Mississippi River approximately 60 miles south of modern St. Louis, Missouri in about 1750. After a major flood in 1785, the village was gradually relocated to its present site on higher ground. The Park was established to "preserve, protect, and interpret for the benefit of present and future generations the themes of French settlement, vernacular architecture, and community form and farming on the frontier associated with Ste. Genevieve".

The Bauvais-Amoureux House is located at 327 St. Marys Road, Ste. Genevieve, Missouri. The property is a part of the Ste. Genevieve Historic District. This District is defined as an area roughly bounded by Main Street and St. Marys Road, Roberts Street, Ninth Street and Seraphin Street in Ste. Genevieve.

The Jean Baptiste St. Gemme Bauvais (Amoureux) House (known throughout the report as the Bauvais-Amoureux House) was built c. 1792 and is one of only three known surviving *poteaux-en-terre* style houses in Ste. Genevieve and one of only five known in the United States. Important architectural features include the vertical log walls and the heavy timber trusses supporting the steeply pitched roof. The walnut ceiling beams are original. The House underwent multiple alterations during the mid-19th century, including the construction of the galleries, reduction in the House length, and interior alterations. Though the House has been altered, it retains integrity and is a critical contributing structure to the Ste. Genevieve National Historical Park. The House is not only architecturally significant but also plays a significant role in the interpretation of the African American experience before and after the Civil War as the home of a free black woman, Pélagie Amoureux. The House is a part of the Ste. Genevieve Historic District, which was listed on the National Register in 2002.

The goal of the Bauvais-Amoureux House project, as defined by the NPS, is to develop critical planning and design documents preparatory to the eventual ultimate treatment of the House and its reuse. This historic structure report is the first phase in this planning and design effort.

# Park Purpose

Ste. Genevieve National Historical Park was authorized by the Consolidated Appropriations Act of 2018 on March 23, 2018. The act incorporates by reference Section 7134 of Senate Bill 1460, which authorizes the establishment of Ste. Genevieve National Historical Park as a unit of the National Park System "to preserve, protect, and interpret for the benefit of present and future generations the themes of French settlement, vernacular architecture, and community form and farming on the frontier associated with Ste. Genevieve."

# Park Planning

This document is part of the Ste. Genevieve National Historical Park planning portfolio. A park planning portfolio is the collection of planning documents that guides decision making and satisfies law and policy. The Ste. Genevieve National Historical Park planning portfolio creates a logical, trackable guide for park management actions. The Bauvais-Amoureux House Historic Structure Report addresses resource preservation for the Bauvais-Amoureux House.

The historic structure report was prepared concurrently with the Foundation Document (completed in 2023) and in advance of a Long-Range Interpretive Plan, a Cultural Landscape Plan (under contract for completion in 2024), and other documents for the park's planning portfolio.

# Methodology

The purpose of the historic structure report is to provide a compilation of the findings of research, investigation, analysis, and evaluation of the historic structure. The preservation objectives of the historic property are identified, and treatment measures are recommended for implementing and accomplishing these objectives. The Historic Structure Report serves as a basis for decision-making and direction for preservation of the building. The report also serves as a record of existing conditions and as a basis for planning future preservation and maintenance.

The Historic Structure Report for the Bauvais-Amoureux House addresses key issues specific to this structure, including archival research and physical investigation to determine construction chronology of the house, investigation of existing physical conditions, evaluation of the surrounding landscape, and evaluation of the existing systems to identify needed upgrades.

## HISTORY METHODOLOGY

Archival research was performed to identify documentation of the history and construction of the building. The purpose of this research and review of documents was to gather information about the original construction and past repair and modifications of the building for use in assessing existing conditions and developing treatment recommendations. These tasks included:

- Review of research and documentation performed by others on the context and background of the founding and growth of Ste. Genevieve, changes in social history over time, and architectural practices that influenced the Bauvais-Amoureux House.
- Research and review of archival documentation to develop the historical background of the Bauvais-Amoureux House.
- Research and review of archival documentation to assist in determining the chronology of the evolution of the architecture and landscape.
- Consultation with local historians and community stakeholders knowledgeable about Ste. Genevieve and the Bauvais-Amoureux House.
- Interviews with living descendants of the Bauvais and Amoureux families.

## EXISTING CONDITION METHODOLOGY

The Bauvais-Amoureux House was previously documented as part of the Historic American Buildings Survey (HABS) in 1956 (HABS No. MO-1114). Other drawing sets reviewed included:

- 1994 drawings for restoration and rehabilitation work.
- 2007 drawings for exterior work, prepared for the Missouri Department of Natural Resources (DNR), Division of State Parks.
- 2011 drawings for electrical work including trenching and new electrical service.

For the historic structure report, drawings were prepared based on drawing sets provided by NPS and from information developed from the HABS documents. These drawings were used for this study as baseline documents to record existing conditions, with field verification or confirmation of select conditions.

The documents were transferred into the current version of Autodesk Revit, a building information modeling software to use for the basis of field work, team collaboration, Changes Over Time graphics, and design option studies. The drawings can be used in the future to prepare drawings for the additional recommended treatments.

The documentation tasks included the following:

- Preparation of measured plans and elevations in Autodesk Revit.
- Documentation of existing construction with photographs.
- Observation and analysis of select conditions and construction of other vertical log structures in Ste. Genevieve for comparative purposes.

## CONDITION ASSESSMENT METHODOLOGY

From November 16 to 18, 2020, representatives from the historic structure report team were on site to perform an investigation into the existing conditions and construction of the Bauvais-Amoureux House.

- Visual inspection and condition assessment of the site, context, and landscape features.
- Visual inspection and condition assessment of the architectural features and building materials.
- Visual inspection and condition assessment of the enclosure and structural systems. (See also the Abbreviated Structural and Building Envelope Assessment Report, included as Appendix C.)
- Visual inspection and condition assessment of the mechanical, electrical, and plumbing systems.
- Identification and assessment of integrity of significant character-defining features and elements.

The condition assessment and physical investigation were limited to areas and features that were readily visible; no finishes were removed to expose concealed conditions. Comprehensive sampling and testing of building components to identify constituent materials and/or determine dates of construction were not performed as part of the historic structure report scope. See also section “Additional Research Requirements” within this document for recommendations for further research and testing.

## TREATMENT AND USE METHODOLOGY

Treatment alternatives were developed in consultation with

NPS with input from community stakeholders and subject matter experts. The treatment methodology tasks included:

- A pre-workshop technical discussion with NPS and the historic structure report team to review critical integrity and stability conditions and refine the treatment approach.
- Selection of a preferred treatment approach and development of specific treatment recommendations with input from the pre-workshop technical discussion.
- Participatory treatment workshop with historic structure report team, NPS, and community stakeholders to discuss the treatment options and identify the preferred alternate.
- Preparation of the Historic Structure Report document, incorporating feedback from NPS, community stakeholders, and subject matter experts.

# Building Use

The building is currently operated as a seasonal visitor attraction with plans for possible year-round use.

# Executive Summary of Existing Conditions and Treatment

## OVERVIEW

This historic structure report was produced for the Ste. Genevieve National Historical Park, the 422nd unit of the NPS, U.S. Department of the Interior. The purpose of the historic structure report is to serve as a guide for the re-use, repair and maintenance, and future rehabilitation work at the Bauvais-Amoureux House. The report was prepared in adherence with NPS policies and guidelines, including The Secretary of the Interior's Standards for the Treatment of Historic Properties, NPS-28: Cultural Resource Management Guideline, and Preservation Brief 43: The Preparation and Use of Historic Structure Reports. The report addresses research into historical documentation, physical evidence of changes over time, an understanding of the current physical condition of the House and site, and recommendations for treatment and re-use in alignment with the park goals for flexible interpretive use and protection of the historic resource, as communicated to the project team.

## DEVELOPMENTAL HISTORY

The Bauvais-Amoureux House has a rich history, spanning nearly 230 years. A wealth of primary and secondary resources exist that contribute to the understanding of the House's architectural history and social context. Part 1: Developmental History, "Historical Background and Context" compiles the research conducted by our team and others into a comprehensive contextual narrative that has never before been assembled with a specific focus on the Bauvais-Amoureux House.

This section summarizes the history of early French settlement in Ste. Genevieve in relation to the Bauvais family migration from Kaskaskia, the households of Jean-Baptiste *fils* and his brother Vital, and Jean-Baptiste *fils*'s construction of his unusual-at-the-time poteaux-en-terre house in c. 1792 following regional vernacular traditions. The developmental history follows the family of Jean-Baptiste *fils* through their ultimate sale of the property in 1852 to Benjamin Amoureux and his wife Pélagie, a formerly enslaved woman of color, who represents an important shift in the cultural perspective of the House. For the next 70 years, successive generations of the mixed-race Amoureux family shepherded the House into the 20th century when it is finally sold outside the family in 1923. This period of c. 1792 through 1923 represents the Period of Significance for the House, owing to the influence of the Bauvais and Amoureux families, the national architectural significance of the original structure, and the major alterations that occurred through c. 1900.

## CONDITION ASSESSMENT SUMMARY

Part 1: Developmental History, "Condition Assessments" provides a detailed summary of observed construction, maintenance concerns, and existing conditions as of the time of the physical investigation field work in November 2020.

This section is tabularly organized into a building feature master list that includes the site and landscape, exterior enclosure, interior finishes, structural systems, and building service, mechanical, and control systems.

In general, the House was found to have a high level of integrity, as defined by the criteria outlined in National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation. However, a number of maintenance conditions were identified as well as areas of significant structural distress due to deterioration and insect damage of the timber framing. Overall, the House could be considered to be in "Fair" to "Poor" condition due to the structural distress. Additional information regarding structural and envelope conditions and treatment recommendations can also be found in the companion report to this historic structure report, the Abbreviated Structural and Building Envelope Assessment Report, prepared in 2021 by the same team. A "Summary Condition Assessment Table" is also provided that identifies the condition rating (on a qualitative scale of Good to Failed), the deficiency rating (on a qualitative scale of None to Critical), and the repair priority (on a qualitative scale of Low to High).

## RECOMMENDATIONS FOR ULTIMATE TREATMENT AND USE

The ultimate use for the Bauvais-Amoureux House as part of the Ste. Genevieve National Historical Park has been identified as a year-round interpretive space in which the programming should remain flexible to accommodate future park planning. Stabilization and preservation of the structure has been identified as a key priority, along with sensitive measures to ensure the House is universally accessible for public enjoyment and conditioned for public comfort.

Part 2: Treatment and Use provides a detailed summary of the preferred treatment approach as identified through the participatory workshop with NPS staff and community stakeholders held on June 3, 2021. Recommendations are provided for site and landscape features, accessible entry and pathways through the interior, envelope repairs, structural stabilization, and introduction of new building systems (HVAC, electrical, and fire suppression). NPS will further consider and study the impact of introducing new climate control systems to the building and make a future determination on implementation of these recommendations.

The ultimate goal of the preferred treatment approach is to ensure that the House is structurally sound with a weather-resistant enclosure. Recommendations have been made for modern interventions to facilitate the stabilization, enjoyment, and continued use of the House. This goal can be met while protecting and preserving the character defining features that comprise the national significance of the House as an extremely rare form of French Colonial vernacular building technology.

This historic structure report is one document within the Ste. Genevieve National Historical Park planning portfolio, a collection of documents that guides decision making for the historic resources within the park. As part of the planning portfolio, the historic structure report does not represent the final determination of the ultimate treatment or use, but provides recommendations based on the best information available at the time of research and investigation.

# Project Team

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# Special Thanks

David Bova for his generosity in discussing and sharing his family history.

The Donze Family: Joel (Jack) and Bev Donze, Michael Donze for their willingness to discuss their family's stewardship of the property, and their parents Frances (Frankye) and Norbert (Boats) for their stewardship in the preservation and interpretation of the House.

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Donna Rausch and Jim Baker for their passion, interpretation, and stewardship of the property as part of the Missouri State Historic Sites system.

Don Strand for his dedication to telling Pélagie's story and documenting his family genealogy, as well as his significant and valuable contributions to the report.

Mike "Skip" Weiler for his dedication to the family history and the Foundation for Restoration of Ste. Genevieve.

The City and County of Ste. Genevieve for their stewardship and preservation of important historical documents that help to tell this story.

Ste. Genevieve Catholic Parish for their retention and preservation of important documents that represent people who were not represented in other legal historical records through baptism and marriage.

# Additional Research Requirements

This historic structure report represents our understanding of the social history, changes over time, condition assessment, and integrity of the Bauvais-Amoureux House at the time of the report's preparation. While we have endeavored to be thorough in our research and documentation, there are necessarily additional subjects for study, analysis, and testing that can be performed to better inform future documents, treatment, and interpretation of the property in support of Ste. Genevieve National Historical Park.

The following are recommendations for areas of additional study:

## HISTORICAL RESEARCH

Review, transcription, and translation of the earliest Ste. Genevieve historical documents which are in French; research for this report relied heavily on translated excerpts, summaries, and indexes previously prepared by others. These documents are primarily located in the following collections, but other collections not noted below may also have significant holdings:

- Ste. Genevieve County Court (original documents)
- State Historical Society of Missouri, Ste. Genevieve Archives, 1756-1930 (microfilm)

Further research into primary and secondary sources related to the founding and development of Ste. Genevieve and the early records of documentation of the town's vertical log structures. Potential collections for further study:

- Charles E. Peterson papers, in the collection of NPS, recently relocated to Ste. Genevieve National Historical Park.
- University of Missouri, Western Historical Manuscripts Collection
- State Historical Society of Missouri, Ste. Genevieve Archives 1756-1930 (microfilm)
- Missouri Historical Society/Missouri History Museum and Library

## MATERIALS SAMPLING AND TESTING

In consideration of the preferred treatment approaches and ultimate use, the interpretive goals for the structure have not yet been determined and are pending direction from the Long-Range Interpretive Plan and other park planning efforts. Conceptual treatments provided in this document should be further supported by a thorough review and study of each material and component in order to properly date the periods of construction that exist. The sampling and testing recommended below will inform future restoration and

rehabilitation treatment and also assist with interpretive planning:

- Mortar and bousillage analysis (in progress in 2021 by NPS National Center for Preservation Technology and Training (NCPTT)).
- Geotechnical analysis for site soil conditions.
- Finishes analysis to better understand changes over time for the interior plan and to narrow potential dates for existing finishes and partition walls.
- Additional dendrochronological dating, particularly for gallery framing members in an effort to narrow the potential construction date for the galleries which lack documentation in the historical record.
- Lumber and nails analysis to better understand changes over time, particularly for the west wall modifications which also lack documentation in the historical record.
- Remove exterior siding to observe the top plate at the east wall for evidence of any gallery framing on the east, potentially to be performed with future siding repairs or replacement.

### SURVEY, ASSESSMENT, ANALYSIS

A number of studies to support the ultimate use and interpretation of the House are in progress and others are recommended:

- Developmental Concept Plan to guide property acquisition and use.
- Long Range Interpretive Plan.
- Cultural Landscape Report and Cultural Landscape Inventory (in progress and scheduled for completion in 2024).
- Archeological Overview and Assessment (planning for the archeological work was initiated by MWAC in 2021 and is scheduled to take place in 2022).
- 2001 unfinished updates to NHL nomination for Ste. Genevieve.
- Risk assessment for seismic events, seismic analysis, and stabilization.
- Risk assessment for future flooding and impact of Mississippi River levee deferred maintenance.

### OTHER CONSIDERATIONS

- Public input regarding family name spelling and the final name of the property.
- Historical study into the roles of people of color, both freed and enslaved, through the history of Ste. Genevieve.

# Related Studies and Drawings

Related drawing sets, studies and reports provided by NPS were reviewed as part of the preparation of this report. Full citations for these documents are found in the Bibliography to this report. These documents included:

| | |
|---|---|
| 1936, 1986 | HABS Photographs |
| 1956 | HABS Measured Drawings |
| 1959, 1970 | Ste. Genevieve, National Survey of Historic Sites and Buildings |
| 1986 | Tree Ring Dating of French Colonial Vertical Log Houses in St. Genevieve, MO |
| 1994 | Measured and Conceptual Drawings |
| 1996 | A Preliminary Report on Excavations at the St. Gemme Beauvais/Amoureux House, Ste. Genevieve, Missouri |
| 2001 | Ste. Genevieve Historic District, National Register of Historic Places Registration Form |
| 2005 | Documents related to hazardous materials clean up of the attic space |
| 2007 | Cedar Shingles and Siding Replacement Drawings |
| 2011 | New Electrical Work Drawings |
| 2016 | Ste. Genevieve Special Resource Study |
| 2016-18 | Documents related to the proposed National Historical Park |
| 2019 | Quit claim deed conveying the Bauvais-Amoureux House to NPS |
| 2019 | Ste. Genevieve Boundary Adjustment Public Law No 116 |
| 2020 | Forsyth Engineering Structural Analysis |

| | |
|---|---|
| 2021 | Property acquisitions information |
| 2021 | Archeological Overview and Assessment of Ste. Genevieve National Historical Park |
| 2023 | Ste. Genevieve NHP Foundation Document |
| 2025 | Cultural Landscape Report (in progress) |

# Glossary[1]

**Appentis** (French) A small lean-to or shed structure added to a main structure, typically on the end walls.

**Arpent** (French) A French measurement of land area, roughly equivalent to an English acre; also a unit of measure of distance (approximately 192 English feet).

**Bousillage** (French) A mixture composed of mud or clay with straw, or hair, for infill between posts in the construction of vertical log buildings.

**Caveau** (French) A crawl space or cellar.

**Collar Tie** The horizontal member of a Norman truss, located at the approximate midpoint of the diagonal top chord members.

**Coyau(x)** (French (pl.)) A short timber used to extend the rafter, creating a slightly flared appearance, which assists with shedding water away from the building walls.

**Colombage** (French) Half-timbered construction, see "Pan-de-bois." Sometimes also used to refer generally to the infill between timbers.

**En filade** (French) An interior layout that is a single room wide with successive rooms being interconnected, often with aligned doorways.

**Galerie** (French) Gallery or veranda; a porch extending the full length of either one, two or four sides of a building.

**Grenier** (French) Attic; the loft of a house.

**Habitant(s)** (French (pl.)) French settlers, especially those of French-Canadian descent used to denote a person engaged in agriculture.

**King Post** The central vertical member of the Norman truss which connects the diagonal top chord members to the collar tie.

**Liteau(x)** (French (pl.)) Small battens or straps onto which roofing thatch or shingles were attached.

**Nogging** Brick masonry infill between wood framing members.

**Norman Truss** A French vernacular variation on the “king post truss,” characterized by a steep pitch, through purlins, and the elevated position of the collar beam.

**Rafter** A diagonal roof framing member: “primary rafters” are those of the main roof structure, and “secondary rafters” are those of the gallery roof structures.

**Pan-de-bois** (French) Also called "half timbered," a type of construction which uses large wood posts and beams to form the framework for the walls and floors. The framing is often left exposed for aesthetics, and the space between timbers is infilled with stone, brick, or clay and straw.

**Pierrotage** (French) Infill of stone and clay daub or limemortar; packed between the posts of a heavy timber frame.

**Poteau(x)** (French (pl.)) Timber post or vertical log member.

1 Terms referencing French vernacular construction are adapted in part from the glossary provided by Jack Richard Luer and Jesse W. Frances in *Vanishing French Heritage: A Complete Study of the Vertical Log Homes of the Illinois Country,*

**Poteaux-en-terre** (French) "Posts in the ground"; a construction type where the vertical logs are set into the ground.

**Poteaux-sur-sole** (French) "Posts on a sill"; a construction type where the vertical logs sit on a horizontal sill plate, and the foundation is typically constructed of stone masonry.

**Purlin** A longitudinal, horizontal member of the roof framing that provides midspan support for the rafters; "through-purlins" pass over the top of the truss diagonal top chords.

**Ridge Beam** A longitudinal, horizontal member at the apex of the roof framing which supports the top ends of the rafters.

**Ridge Brace Truss** A longitudinal flat truss at the apex of the roof which provides support between the Norman trusses; the ridge beam forms the top chord of this truss.

**Top Chord** The diagonal members of the Norman truss that form the distinctive "A-frame" shape, with the crossbar formed by the collar tie.

**Top Plate** A horizontal wood member that bears on the tops of the vertical log walls.

**Trenail** A tapered wood pin used in traditional heavy timber construction.

# Date Conventions

The dates as presented in this historic structure report are drawn from the information available at the time of writing. In a few cases, the dates are supported by direct historical documentation, but in the majority of cases, the dates proposed are based on the project team's best determination based on factors such as physical evidence, circumstantial documentation, research by others, professional experience, or those dates adopted by general consensus. Further research, investigation, and analysis may refine or refute the dates proposed herein.

**No notation** Direct attribution of the date or date range given is supported by historical documentation or physical evidence; ex: 1937 or 1852–1923.

**Circa (c.)** Attribution to within one or two years of the date or date range given is supported by historical documentation or physical evidence, but the precise dates are not known; ex. c. 1792 or c. 1852 – c. 1856.

**Dash (–)** Indicates that the range given is inclusive of the years between the start and end dates, such as an ongoing event or period of ownership, ex: 1923–1963.

**Slash (/)** Indicates that two or more specific dates are referenced without being inclusive of the years between; ex: c.1792/c.1852 or 1940/1986.

**Decade Span** Indicates a ten-year span, but the date or date range given are approximate and may be refuted by further study; ex: 1920s or 1880s – 1900s.

# Resources in this Report

As part of the research into developing the historical background and context, the historic structure report consulted and/or researched collections at the following:

- Mercantile Library at St. Louis University-Ernst Connelly Collection
- Ste. Genevieve Archive in the Missouri State Historical Society
- Ste. Genevieve County Courthouse
- Felix Vallé House State Historic Site
- National Park Service Site files
- Various Family Records and collections

# Names as Used in this Report

As part of the research into the historical documentation and in consultation with living members of the Bauvais and Amoureux families, this historic structure report has employed the recommended spelling of the family names throughout this document. Additional information is included below in "It's in the Name."

## IT'S IN THE NAME

A special challenge in this document is to identify the correct or appropriate spelling and use of certain names. Both Bauvais and Amoureux have multiple spellings in the historic record. Family documents and interviews with family members and local historians have revealed more than one preference for the most appropriate spelling of each name.

The historical documentation that follows supports the HSR's use of the name spellings throughout this report. They are copies from the Ste. Genevieve Archive at the Missouri Historical Society, the Ste, Genevieve County Courthouse, and the Ste. Genevieve Catholic Church archive.

### Bauvais

When the Bauvais family came from France, their name was spelled BEAUVAIS. However, early Ste. Genevieve documents show the name spelled BAUVAIS by the family. The below 1785 birth record of Vital and Félicité (Janis) Bauvais's third daughter shows the following spellings:

*Vitale Bauvais — in his own hand*

*Félicité Bauvay*

*Louis Beauvai*

*Félicité Beauvais — in text*

The name has been anglicized, truncated and changed throughout history. There are Bovas that retain a phonetic spelling of the name. Family history notes that a school teacher registered a Bauvais child for the term and simply spelled the name how it literally sounded. The Bova family are direct descendants with long ties both present and past to the community. The St. James surname is a derivative of St. Gemme and stems from J. Felix St. James, who was the son of Auguste St. Gemme and the grandson of Jean Baptiste Bauvais *fils*, and changed his name to run for political office prior to the Civil War.

While modern convention defers mostly to the Beauvais spelling, historic documents from the period when the residence was built clearly show the Jean Baptiste Bauvais *fils* spelled the name BAUVAIS, while his brother Vital preferred the spelling BEAUVAIS. Where possible, the individual preferred spelling has been adopted for use in this document with acknowledgment that this can be confusing to modern readers.

### Amoureux

Amoureux has been spelled in a variety of ways, as well. Though more consistently spelled AMOUREUX, it is also found as AMOREUX, AMOUREAUX, and similar variants sometimes with a double M. Felix Amoureux's will used the spelling Amoureaux, while Felix Henry's 1914 estate probate record spelled the name Ameraux. Census records also include other variants and misspellings of the name.

As Benjamin routinely signed his name Amoureux, this is the spelling adopted for this document.

### Pélagie

No handwritten documents attributable to Pélagie have been found to date, only her mark of an "X" next to her name on legal documents. Census records indicate that she

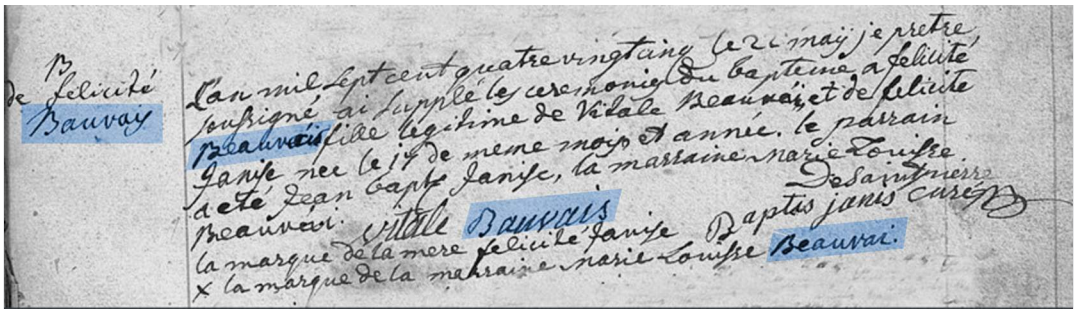


Figure ASD-01. Baptismal record for Félicité Bauvais, third daughter of Vital and Félicité Janis Bauvais, showing the signature of "Vitale Bauvais" with other spellings for the family name as Bauvay, Beauvais, or Beauvai, from Ste. Genevieve Catholic Church archive.

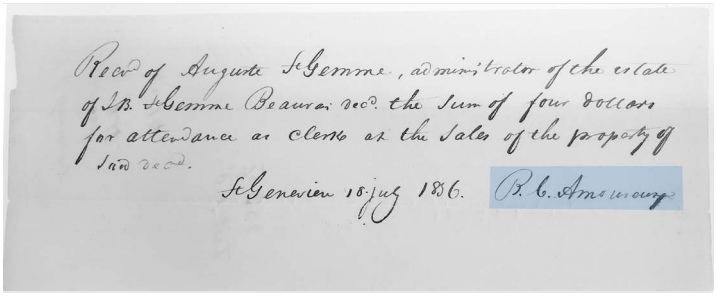

Rec'd of Auguste St Gemme, administrator of the estate of St. St Gemme Beauvais rec'd the sum of four dollars for attendance as clerk at the Sales of the property of said rec'd.
St Genevieve 16 July 1856. B. C. Amoureux

Figure ASD-03. 1856 estate receipt, showing the signature of Benjamin Amoureux as "B. C. Amoureux." from the Ste. Genevieve County Courthouse records.

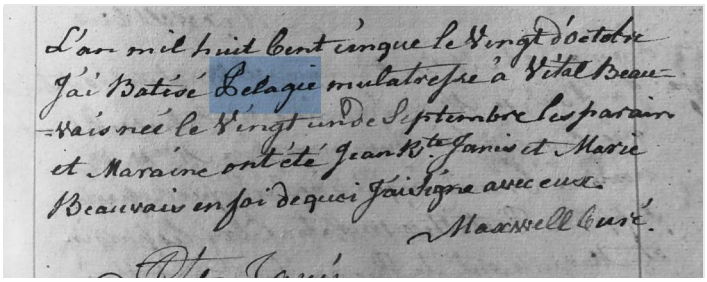

L'an mil huit cent cinque le Vingt d'octobre
J'ai Batisé Pelagie mulatresse à Vital Beauvais née le Vingt unde Septembre les parain et Maraine ont été Jean Bte Janis et Marie Beauvais en foi de quoi J'ai signé avec eux.
Maxwell Curé.

Figure ASD-03. 1805 baptismal record for Pélagie, from the Ste. Genevieve Catholic Church Archive.

may not have been able to read or write. The Code Noir laws prohibited Blacks from learning to read or write, and illiteracy was not uncommon for residents of Ste. Genevieve at this time, across all racial identities and socioeconomic standings. As such, records prepared by others must be consulted for the spelling and use of her name.

The earliest record of Pélagie is her 1805 baptismal record, where her name is given without the accent, although an accent on the first E is a more common spelling convention for the name in French. Later documents, including her children's baptismal records, Felix's marriage record, and an 1834 lawsuit where she is listed as a resident of a property being foreclosed upon, typically identify her as Pélagie Vital. The children she had with Benjamin were all baptized with the family name Amoureux.

It was not unusual for enslaved individuals or formerly enslaved individuals to be given or assume the last name of their enslaver, in this case Bauvais. It was not as common for the surname to be given as the first name of their enslaver. It is unknown if Pélagie chose the surname Vital, if the Bauvais family gave her that name, or if court documents assigned it. Additional context on naming practices in Ste. Genevieve, particularly surnames for enslaved individuals and formerly enslaved individuals would be warranted.

It was not until the 1860 census records that she is specifically listed as Pélagie Amoureux. It is important to note, the use of Vital on documents before 1860 should not be inferred as indicating legal status as either married or unmarried. The French practice of married woman maintaining their legal birth names or signing documents with a combination of their birth and married names was commonly, but not exclusively, followed in Ste. Genevieve. As the city Americanized into the latter half of the 19th century, women adopting their married surname became standard practice. The shift from Vital to Amoureux may be reflective of these changing cultural norms.

For the purposes of this report, the more conventional French spelling of Pélagie has been adopted and her surname is given as Vital only in reference to dates before her relationship with Benjamin began c. 1830.

# Part 1: Developmental History

## Introduction

### INTRODUCTORY COMMENTS

#### Native American Habitation and Land Use

The following narrative spans a broad historical context that documents the interaction of peoples across thousands of years of time and place. Missouri's archeological record is vast and diverse, with studies that reflect over 13,000 years of human adaptations to the landscape and environment. This introduction is meant to provide a broad context of the people who occupied and developed this area prior to the arrival of European explorers, fur traders, and miners and has attempted to incorporate the best scholarship available at the time of its preparation.

#### Harmful Language

Terminology relating to and recognition the of indigenous peoples that were removed from the region to make way for European and American settlers and enslaved individuals is important in the recordation and documentation of the House. This document is generated from both primary and secondary sources and is meant to contribute to the understanding of the enslaved community in Ste. Genevieve, as well as the formerly enslaved individuals and free people of color who lived there and contributed to its history. These individuals are identified in the historic record and referenced with deference to language appropriate for developing this context. Historic documents often contain language and terminology that is widely considered offensive and racially discriminatory in the United States today. Where used in this report, these terms represent direct quotations from historic sources, with full acknowledgment of their harmful history of use.

Resources from community-sourced guidance, meant to be shared with those documenting slavery in the United States and the Americas, have been applied here. One helpful resource from the Culpeper Branch of the NAACP presents useful considerations in documenting slavery. As aptly noted in their guidance: "...all words we know to talk about enslaved people of African descent in these Americas prove insufficient, both for the brutality against them, and for their remarkable overcoming."[1]

## Historical Background and Context

### SETTLEMENT AND LAND USE PRE-1700

#### Southeast Missouri

Ste. Genevieve is in the central or middle Mississippi Valley, a region that was first settled during the Paleo-Indian period and was continuously occupied through the Woodland Period and into the Mississippian Period.[2]

By the Woodland Period (1000 BCE – 1000 CE), ornately decorated pottery styles were found, and permanent village sites became more common. Tools and weapons were refined, and the bow-and-arrow was introduced, while agricultural practices and plant cultivation continued to grow.

During the Mississippian Period (800 – 1600 BCE), complex social, political, and economic structures were developed, and Cahokia on the east side of the Mississippi River near modern-day St. Louis became one of the greatest cultural centers in North America.[3]

The Mississippians are recognized for their earthwork structures where pottery, projectile points, and agricultural practices were evident. Existing mounds associated with this period are present near Ste. Genevieve. The Common Field Archeological Site (23SG100) is listed in the National Register of Historic Places and is located within the Common

1 P. Gabrielle Foreman, et al. "Writing about Slavery/Teaching About Slavery: This Might Help" community sourced document, 26 July 2023, at http://www.naacpculpeper.org/resources/writing-about-slavery-this-might-help.

2 Paleo-Indian references the period associated with the oldest sites and artifacts. These sites and artifacts date between 11,000-8,000BCE and some Archaic period sites and artifacts dating between 8,000 and 1,000 BCE.

3 "Archaeology in Missouri." *Missouri Archeological Society*. Accessed at https://missouriarchaeologicalsociety.org/archaeology-in-missouri/.

Figure DH-01. Illustration of the dress of a member of the Kaskaskia nation, from a 1796 map illustration by Georges Collot. (Source: Bibliothèque nationale de France, https://gallica.bnf.fr/ark:/2148/btv1b55013299j#)

Field area south of town near where Cotton Woods Road intersects with U.S. Route 61.[4]

The largest Mississippian urban center was established at Cahokia, Illinois, near St. Louis, where people lived in large, planned, permanent towns with ceremonial centers. Cahokia is named after the Cahokia Nation, now recognized as part of the Peoria Nation. At the height of its populace, the urban center grew to 20,000 people. They were part of an extensive cultural and religious tradition throughout most of the Midwest. Villages were located along both sides of the Mississippi River with features like farmsteads, sacred rock art, ceremonial centers, and transportation systems. Long distance trade and travel routes were established throughout the area and were influenced by natural features, adapting to changing terrain and following the waterways. The population at the Cahokia site declined significantly by the early 1400s. The descendants of the Mississippians are most likely the historically known Dhegian Sioux speaking tribes of the mid-continent area. When and how the Mississippians became the Osage, Omaha, Ponca, Quapaw, and Kaw nations is a topic of lively scholarly debate.[5]

With the decline of Cahokia, people moved away from the region. Some moved west and south while others stayed in the central Missouri area and used the elaborate trail network that connected the broader region. Tribes were established on both sides of the Mississippi River and included the Cahokia, Kaskaskia, Michigamea, Peoria, and Tamaroa, with other Algonquian speakers moving into the area from the east. These lands, rich in natural resources, also attracted Europeans expanding west in the seventeenth century. Tribes that interacted with these early Europeans included the Osage, Peoria, Illinois, Shawnee, and Delaware nations. European diseases, along with power struggles over rights to the land and enslavement, devastated the Native American people in this area and across the country.[6]

The historic period represented in Missouri's archeological sites, included river settlements, like those near Ste. Genevieve, St. Louis, and St. Charles. Tribes that lived in or passed through Missouri included the Osage, Otoe-Missouria, Iowa, Delaware, Shawnee, Kickapoo, Sac-Fox, Potawatomi, Peoria, and Cherokee nations.

## EARLY EUROPEAN EXPLORATION AND SETTLEMENT

American colonial history often emphasizes the colonies on the East Coast, but the first Europeans to colonize the Mississippi Valley were French fur-trappers and Catholic priests. This line of colonization ran from Canada to modern-day Louisiana, largely along the Mississippi River. Historian Robert Michael Morrissey noted that scholars of the Illinois Country have "revealed a history characterized by diversity and dynamism." Morrissey creates a context around the main French-Native settlements of Cahokia and Kaskaskia, both communities with centuries of pre-contact history. This area, called *le pays des Illinois* or the Illinois Country, was remote from both Canada and New Orleans, with little

4 National Register of Historic Places, "Common Field Archeological Site," Ste. Genevieve, Ste. Genevieve County, MO, National Register #69000306.

5 "Before the French." Ste. Genevieve National Historical Park Foundation Document, 2023.

6 Ibid.

governmental oversight. By necessity, the communities grew into a network of Native and French villages.[7]

Intermarriage, intercultural connections, and racial identity are part of the early history of Illinois Country. While there were frequent marriages and close ties between the French settlers and the local Indigenous tribes, this was not an area where diverse cultures and races interacted without bias or tension. Community, cultural, and racial identities were "drawn in complex and often idiosyncratic ways, often by local people themselves as much as by imperial authorities."[8]

During this time, the population of the Illinois Country was diverse and multinational, with members of the 12 nations of the Illinewek (the Illinois Confederacy) in the area, as well as other nations including the Potawatomi, Sauk, Fox, Kickapoo, Osage, and others seeking asylum from warring factions in the East.[9] In Missouri near the confluence of the Missouri and Grand Rivers about 250 miles north and west of Ste. Genevieve, the Indigenous groups that lived in the area also included the Otoe-Missouria and Ioway.

Earliest accounts of French Europeans in the Illinois Country are from the explorations of fur trader Louis Joliet and Jesuit missionary Father Jacques Marquette in 1673. Traversing the Mississippi River and utilizing trails established by Native Americans, they sought a route to connect the Great Lakes to the Gulf of Mexico, largely by water. Their expedition turned back near the mouth of the Arkansas River but traveled far enough south to confirm that the through water route they sought did exist.

European exploration, occupancy, and eventual colonization of the Illinois County had long-ranging impacts on both the ecology and people of the region, decimating fur-bearing animal populations, appropriating significant lands for agriculture, introducing new diseases, and enslaving and displacing Native American communities.[10]

Figure DH-02. 1721 Map of French Louisiana, from Bibliothèque Nationale de France. (Source: Bibliothèque nationale de France, https://gallica.bnf.fr/ark:/12148/btv1b530092504)

## La Louisiane

Equipped with Joliet and Marquette's information, Robert Cavelier de La Salle, a seventeenth century French explorer, charted a route from Fort Frontenac in Ontaria, Canada, across the Great Lakes to the Illinois River, then down the Mississippi River to the Gulf of Mexico during his 1682 expedition conducted on behalf of the French government. La Salle named the lands *la Louisane* (Louisiana, after the French king Louis XIV) and claimed them "by virtue of His Majesty's commission" for France.[11] LaSalle established military forts along his route, including Fort St. Louis at Starved Rock, Illinois, and Fort Crevecoeur near Peoria, Illinois. Following LaSalle's explorations, a European townsite and Catholic mission was established at Cahokia in 1699 and another at Kaskaskia in 1703 by French Canadians who sought to benefit from the fertile natural resources that had supported Native Americans for thousands of years before.[12]

7 Robert Michael Morrissey. "Le Pays des Illinois Finds its Context: The Early History of Illinois in a Continental Perspective." *Journal of the Illinois State Historical Society* (1998-), Vol. 111, No. 1-2, *Illinois History-A Bicentennial Appraisal* (Spring/Summer 2017), pp 9-30. Accessed at https://www.jstor.org/stable/10.5406/jillistathist-soc.111.1-2.0009

8 Ibid. 19.

9 "Before Euro-American Settlement." United States Forest Service. Summary of excavations and research of Mark Schurr & Dr. Madeline McLeester at the Midewin National Tallgrass Prairie and article: Madelein McLeester & Mark R. Schurr. "Uncovering Huber Lifeways: An Overview of Findings from Four Years of Excavations at the Huber Phase Middle Grant Creek Site (11WI2739) in Northern Illinois," *Midcontinental Journal of Archaeology*, 45:2, 102-129. Accessed at https://www.fs.usda.gov/detail/midewin/learning/history-culture/?cid=stelprdb5155177

10 Louise Phelps Kellogg, (ed.). *Early Narratives of the Northwest, 1634-1699.* (New York: Charles Scribner's Sons, 1917). 223-230. From the journals of The Mississippi Voyage of Jolliet and Marquette, 1673. Accessed at www.americanjourneys.org/aj-051/

11 "The Explorers: Rene-Robert Cavelier de La Salle 1670-1687." Virtual Museum of New France, Canadian Museum of History accessed at https://www.historymuseum.ca/virtual-museum-of-new-france/the-explorers/rene-robert-cavelier-de-la-salle-1670-1687/

12 "The Creation of Ste Genevieve and a Unique Culture," Ste. Genevieve National Historical Park Foundation Document, 2023.

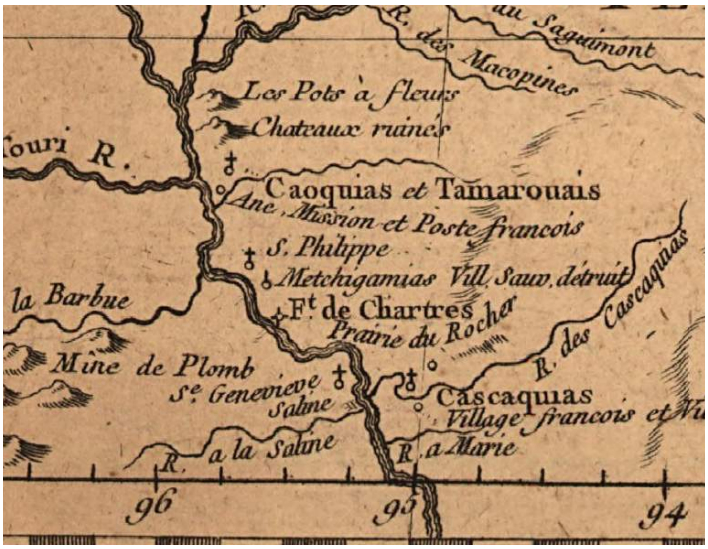



Figure DH-03. The first map illustrating the village of Ste. Genevieve, 1755.(Source: *Partie occidentale de la Nouvelle France ou Canada*, Library of Congress, https://www.loc.gov/resource/g3400.ar077400/)

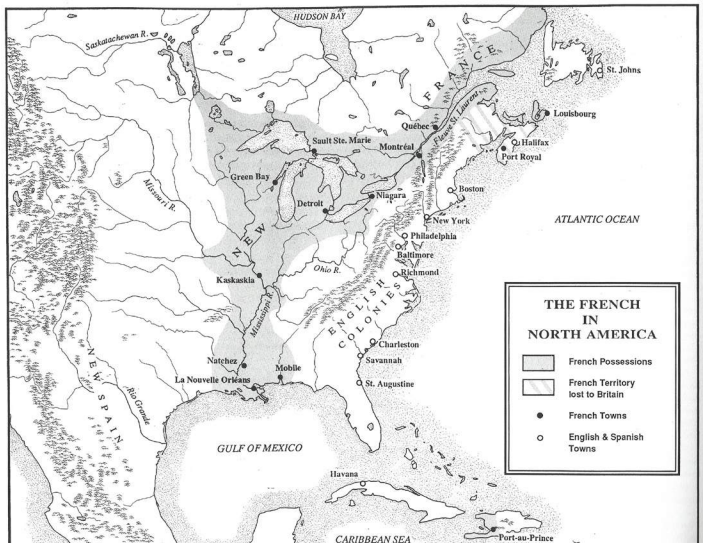



Figure DH-04. Map showing the location of French territory during the 18th century. (Source: Luer and Francis, Vanishing French Heritage, 12)

The French occupancy of Upper Louisiana was part of broader pattern of European exploration and colonization worldwide. France, Spain, and Great Britain fought multiple wars in the 17th and 18th centuries over power and control of their colonial territories. The British victory in the Seven Years' War (also called the French and Indian War) ultimately culminated in the total loss of French territory in continental North America to both Great Britain and Spain in 1763.

Shifting governance of the Illinois Country in the 1760s brought Ste. Genevieve under Spanish control and lead to an influx of settlers into the formerly French-controlled lands. Ste. Genevieve seems to have prospered during this time, with significant population growth to 691 residents, including enslaved persons, in 1772 Spanish census.[13]

## Early European Industry

Southeast Missouri has a long history of mining that began with Native Americans, followed by French-Canadian explorers, and then by European settlers. Lead and fur were the most important exports during the period when the area was under control by the French and Spanish, and then later the United States. Southeast Missouri retains the largest known concentration of lead sulfide in the world, and today remains the largest lead-producing region in the United States. Land has been continuously mined for lead since the first part of the 18th century.

The earliest written account of lead in Missouri was made by Father James Gravier in c. 1700, who journaled about his voyage and documented the potential for lead mining near the Meramec River in Washington County, just west of Ste. Genevieve. Phillipe François Renault, a French politician, metallurgist, and explorer favored by Louis XIV, established the first major lead mine in North America at Mine La Motte (near Fredericktown, approximately 40 miles south and east of Ste. Genevieve) in 1722. [14] Renault transported the first enslaved African individuals to Missouri from the French colony of Saint-Domingue (now Haiti) to labor at the mines.

Lead mining was labor intensive and hazardous to the workers. Extracting the raw materials required intensive physical effort that initially included "open pit" or "strip" mining by digging large shallow pits to expose lead deposits. Later, deep shafts were sunk as a more efficient and profitable means of extracting materials. The first shafts were sunk c. 1819 at Vallé Mines in present day Jefferson County. Raw materials were collected and shipped through Ste. Genevieve to the Mississippi River and eventually to

13 Ekberg, *Colonial Ste. Genevieve*, 43; and *Padron y Lista de los Milicianos y Habitantes de… Santa Genoveva…* (Spanish Territorial Census), 1772. Accessed at https://www.sos.mo.gov/default.aspx?PageID=9621.

14 Kleeschulte, M.J., ed., *Hydrologic Investigations Concerning Lead Mining Issues in Southeastern Missouri: U.S. Geological Survey Scientific Investigations Report 2008-5140*, 8-10.

trade across the world. [15]

## EARLY EUROPEAN SETTLEMENT OF STE. GENEVIEVE

Antecedents of Ste. Genevieve began across the Mississippi River in the Illinois Country, where French and French-descended settlers migrated to a mission established at Cahokia on the east bank of the river as early as 1699. The mission at Kaskaskia was founded four years later in 1703, and following that, small-scale and subsistence economies such as mining lead and salt making began on the west side of the Mississippi River.

French land grants west of the Mississippi River occurred in the last half of the 1740s, spurring more permanent migration across the river. Settlers from Kaskaskia and Fort de Chartres established the first Ste. Genevieve townsite along the west bank of the Mississippi River, about three miles southeast of its present location.[16]

By about 1758, the region supported about 2,000 inhabitants associated with European settlements, as compared to the whole of the territory of Louisiana, whose population was estimated at 7,000. Most settlements were largely agrarian, in which small clusters of families, typically from French Canada, settled to take advantage of the rich and fertile soil of the Mississippi River Valley. Forts and outposts were populated with transient traders, soldiers, missionaries, and Native Americans.[17]

The earliest reference in the extant historic record to identify Ste. Genevieve is in a land survey conducted by notary and surveyor, Jean Baptiste Bertlot *dit* Barrois in 1751. Antoine Heneaux commissioned Barrois to survey his land on the west side of the Mississippi River, and Barrois's 1751 description documented his property and described Heneaux as residing in Ste Genevieve.[18] In 1752, a census of the Illinois Country was completed, and Ste. Genevieve was listed as one of the communities with 23 residents.[19] Finally in 1755, Jacques-Nicholas Bellin, a French hydrographer and member of the *Académie de Marine* and the Royal Society of London, published a map of la Louisane that identified the town of

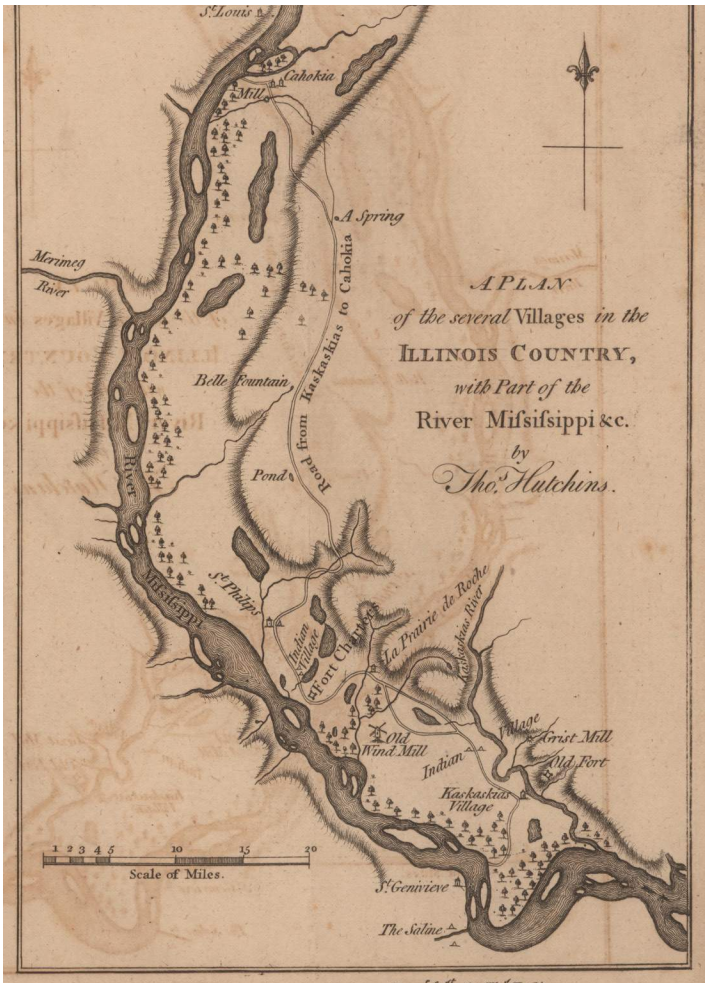



Figure DH-05. 1785 map of villages along the Mississippi River in Illinois Country, including Ste. Genevieve. (Source: JCB Library of Early American Images, jcb.lunaimaging.com)

15 John Edward McCormic. *The Mine La Motte Lead Deposit, Madison County, Missouri*. Open File Report Series OFR-93-94-GS. Missouri Department of Natural Resources, 1993. 2. The Marquette and Joliet expedition was preceded by Hernando De Soto who explored southeast Missouri in 1541, and notes indicate that two of his men along with Native American guides visited lead deposits in Madison County, south of Ste. Genevieve. This was a side exploration on their hunt for gold but noted the lead deposits and active mining at that time.

16 Robert Michael Morrissey. "Le Pays des Illinois Finds its Context: The Early History of Illinois in a Continental Perspective." *Journal of the Illinois State Historical Society* (1998-), Vol. 111, No. 1-2, Illinois History-A Bicentennial Appraisal (Spring/Summer 2017). The NPS Foundation Document for Ste. Genevieve National Historical Park identifies the term "Creole" as being of Spanish descent and referencing those individuals of French, Spanish, Black, or mixed-race that were born in North America.

17 National Park Service, "French Exploration and Settlement: The National Survey of Historic Sites and Buildings," revised 1960, 24.; Louis Houck. *A History of Missouri*. (Chicago, IL: R.R. Donnelley and Sons Company, 1908), 245-250.

18 Carl J. Ekberg. *Colonial Ste. Genevieve: An Adventure on the Mississippi Frontier.* (Carbondale, Illinois: Southern Illinois University Press, 1996) 22.

19 *Recencement General du pays de Illinois de 1752*, Huntington Museum, Loudon Section, Vaudreuil subsection, call No. L0426. Partial transcription available via the Missouri Secretary of State Archives website at https://s1.sos.mo.gov/records/archives/census/pages/territorial. Note that the online transcription contains an error compared to the original document, which also includes family names and other information not included in the transcription. For a full English transcription see Berardinis, Robert de. "The 1752 French Census of Illinois." Illinois State Genealogical Society Quarterly (Winter 2000).

Ste. Genevieve and other settlements along the Mississippi River.[20]

The town of Ste. Genevieve was named after one of the three patron saints of Paris, France. Born "Genovefa" (in the Frankish spelling) around 422 in Nanterre, France, and officially canonized as a saint in the twelfth century, Saint Genevieve and was known for her generosity to the poor. Saint Genevieve's symbolic attributes include a lit candle, which she is often depicted as holding in church iconography.. She was a recognized leader among Parisian women during the tumultuous threat of invasion by Attila the Hun's armies in the mid-fourth century.[21] Many of the earliest settlers of Ste. Genevieve were devout Catholics and looked to the church for naming the community.[22]

The first townsite was in the lowlands and routinely suffered from flooding. Although an important waterway for trade and a major source of support for the community, the river had been a significant threat to the settlement for years.

A major river flood in 1785 caused serious damage to the original townsite. The year became known as "*l'année des grandes eaux* (the year of the big waters)," and contemporary reports document that:

> *"the waters have risen so greatly from their source that they have entirely submerged the village of Santa Genoveva. All its inhabitants having been obliged to retire with great haste to the mountains…they abandoned their houses which were inundated and their furniture and other possessions which they had in them. Although the waters have now fallen, those inhabitants remain along the said coast without yet knowing the place where they can settle."* [23]

A report by Zenon Trudeau, the lieutenant governor of Upper Louisiana from 1792 – 1799, stated that the residents were "warned by so many reiterated occasions, they determined at length to seek a position where they might place the houses under shelter."

Consideration to remove Ste. Genevieve to higher and safer ground was underway, and eventually a new townsite evolved on higher ground to the north, near the North and South Gabouri Creeks. It is here at the new townsite, present-day downtown Ste. Genevieve, where several of the surviving vertical log structures were constructed by the prominent families that migrated across the river.[24]

The new townsite was formed in a grid configuration, similar to town planning for colonial-era St. Louis, Prairie du Rocher, and many other Illinois Country settlements. Some structures may have been disassembled and transported, moved whole, or salvaged for construction materials for the new townsite as residents slowly migrated to the new location, a process that took a number of years.

By 1787, residents in the new town petitioned to have their lots in the Common Field subdivided. Eleven residents were included on the petition, indicating New Town had at least this many residents in 1787; conflicting figures are provided in other contemporary sources that may shift the number of early residents to 13 or more, but historians are not in general agreement with the actual number of new town inhabitants at that time. [25]

The Church did not relocate to the new townsite until 1794, when it was physically moved from the old townsite.

France lost all its North American territory after the Seven Years' War/French and Indian War in 1763, and Spain took control of the land west of the Mississippi River and the port of New Orleans on the east side of the river, with England dominating control of lands east of the river. People continued to move from Kaskaskia and Cahokia to Spanish-controlled Ste. Genevieve, and in 1766, a Spanish census was conducted. It recorded a population that included 319 free people and 228 enslaved people, with Native Americans accounting for 29 of the enslaved individuals.[26] Between 1766 and 1800, the combined population of blacks of African descent, mixed-race, enslaved, and free people of color was recorded as 35 to 44% to the number of whites of European

20 Charles E. Peterson. "Early Ste. Genevieve and Its Architecture." (Columbia, MO: *The Missouri Historical Review*, volume XXXV, No. 2. January 1941) 208; Ekberg. C*olonial Ste. Genevieve,* xxi and 22; and Jacques Nicolas Bellin, *Carte de la Louisiane et des pays voisins*..., 1755, Library of Congress (G3300 1755 .B4), http://hdl.loc.gov/loc.gmd/g3300.ar001800.

21 McNamara, Jo Ann (ed.), et al. *Sainted Women of the Dark Ages*. (Gordon, England: Duke University Press, 1992). 17-37.

22 Houck, *History of Missouri*, 277.

23 Report of Governor Estevan Miro to Conde de Galvez. (Seville, AGI-papers from the island of Cuba, No.209) July 10, 1785. Ernst Connelly Collection, Mercantile Library, Box 2, History of Ste Genevieve File.

24 Bonnie Stepenoff. *From French Community to Missouri Town: Ste. Genevieve in the Nineteenth Century* (Columbia, Missouri: University of Missouri Press, 2006) 16-18.; Peterson. Early Ste. Genevieve, 212.; Rozier, *History of the Early settlement of the Mississippi Valley*, 16.; Ernst Connelly Papers, Copy of a Report of Zenon Trudeau, January 15, 1798, concerning settlements of the Spanish Illinois Country, Mercantile Library, Box 2 Folder History of Ste. Genevieve."

25 Ste. Genevieve Archives, Petitions, #22, December 21, 1787.

26 National Park Service. "Ste. Genevieve Final Special Resource Study and Environmental Assessment." 4.

descent. Enslavement heavily influenced the demographics of Ste. Genevieve; the combined population of black, mixed-race, enslaved, and free people of color was often near equal to the number of whites of European descent.

Many of the agricultural pursuits in the Illinois Country required large tracts of land for their crops and were profitable because of the labor of enslaved individuals. Enslavement of Africans and African-descended people was more prominent in the Louisiana Territory, but the French also enslaved Native Americans. After coming under Spanish control in 1763, Native American enslavement in the territory was ostensibly prohibited. The Indigenous peoples of the Americas were recognized by Spanish law as "free vassals of the crown," and as such, Alejandro O'Reilly, the second governor of Louisiana, issued a degree 1769 outlawing their enslavement. However, this generally went unenforced in the formerly French territories, and Native American enslavement continued.[27] On the other side of the Mississippi River, the Northwest Ordinance was adopted by the United States in 1787 prohibiting slavery in territories located north of the Ohio River. As a result, some French moved west of the Mississippi River into Spanish territory to avoid loss of enslaved labor.

In Ste. Genevieve, the settlers mostly worked their own land in assigned long lots located in the Common Field. Wealthier families cultivated several lots and relied on enslaved labor to work these larger parcels. Census data taken at various times during the colonial period portray that enslaved persons constituted a disproportionately large percentage of the local population, approximately 30% to 40%. In most of these years, several of the wealthier households held the majority of the enslaved persons in Ste. Genevieve, while other Ste. Genevieve families enslaved one to three African or Native American persons.[28] Trade also continued with the Native Americans in and near the community and included the Osage, Illinois, Peoria, and Shawnee nations who largely lived in villages on the banks of the Apple Creek and Shawnee Creek.[29]

The early settlers of Ste. Genevieve built a typical dwelling that was unlike the log cabins seen in most of American westward expansion. Their built environment was populated

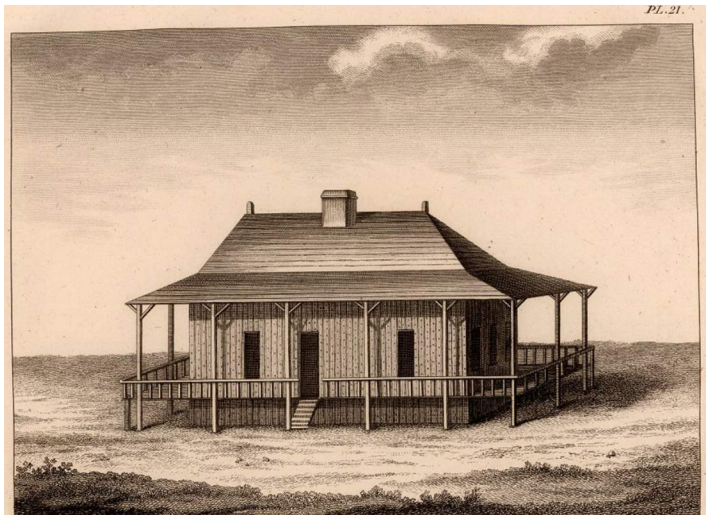


Figure DH-06. 1826 drawing of French residence, after a 1796 map illustration by Georges Collot. (Source: John Carter Brown Archive of Early American Images, https://jcb.lunaimaging.com/luna/servlet/detail/JCB~1~1~189~115900641:French-Habitation-in-the-Country-of . The 1796 original is in the collection of the Bibliotheque Nationale de France, https://gallica.bnf.fr/ark:/12148/btv1b55013299j#.)

largely with one story timber buildings, often of vertical logs either directly in the earth (*poteaux-en-terre)* or resting on a stone foundation or sill (*poteaux-sur-sole)*. Homes typically had galleries or porches (*galeries*) that either wrapped the structure or were located on one or two sides, which sheltered exterior living and working space. Steeply pitched upper hipped roofs had a lower pitch that extended over the porch, creating the broken-pitch roof shape so characteristic to many Illinois Country homes.[30]

> *Scattered around the country however are several French villages as they are called. The inhabitants of these are all French and the French language is the only one spoke. They who are industrious cultivate a little land in small vegetables. The others live miserably by hunting and fishing, their houses are generally one story high and have curiously peaked roofs, with perhaps a little piazza in front overrun with evergreens, under that are congregated parrots, canary birds, cats, and lapdogs in the great harmony the greatest simplicity of manners prevails*

27 Gwendolyn Midlo Hall. A*fricans in Colonial Louisiana: the Development of Afro-Creole Culture in the Eighteenth Century*. (Baton Rouge, LA: Louisiana State University Press, 1992) 336-337; Stephen Webre, "The Problem of Indian Slavery in Spanish Louisiana, 1769-1803." *Louisiana History: The Journal of the Louisiana Historical Association,* Vol. 25, No. 2 (Spring 1984), 117-135; and Leila K. Blackbird, " 'It Has Always Been Customary to Make Slaves of Savages': The Problem of Indian Slavery in Spanish Louisiana Revisited, 1769–1803." *The William and Mary Quarterly,* Vol. 80, No. 3 (July 2023), 525-558.

28 Henry Marie Brackenridge. *Views of Louisiana Together with a Journal of a Voyage Up the Missouri River in 1811*. (Chicago, IL: Americana Classics, Quadrangle Books, Inc., 1962 from first edition published in 1814) 127; Statistics from territorial census records from 1752, 1766, 1787, 1791, and 1787, as summarized by Robert Mueller.

29 Stepenoff, *French Community to Missouri Town*, 14.

30 National Park Service. "French Exploration and Settlement." 26.

*among them.*[31]

The farmers cultivated plots within the Common Field, where long lots that extended from the river were divided among the residents. The larger Common Field was fenced to protect crops from wandering livestock. In his recollections, Henry Marie Brackenridge described the setting of Ste. Genevieve as follows:

> *One fence encloses the whole village field, and this is kept up at the common expense. The river side is left open, the steepness of the bank rendering any enclosure unnecessary. The field is divided into a number of small lots, of an equal size; a certain number of arpents in front, and a certain number in depth. The more wealthy possess and cultivate several of these lots, while some of the poorer class do not own one entire…Their agricultural labors commence in the month of April when the inhabitants with their slaves are seen going and returning each morning and evening, for eight or ten days with their ploughs, carts, horses., etc.*[32]

The new townsite was laid out roughly in a grid with blocks of approximately 350 by 400 feet. Blocks were sometimes divided into two or more parts. Several residents owned an entire block. Each building site was termed an emplacement, and most were surrounded by wood fences, sometimes of palisaded logs.

By the time the William Clark of the Lewis and Clark Expedition reached the area across the Mississippi River near Ste. Genevieve in November 1803, the population was around 1,000 people, comprised of primarily French Creole families. Although this was a French community, France ceded lands west of the Mississippi River to Spain who controlled the area from late 1762-1800.[33]

Historical events including the American Revolution (1775-1783), the Louisiana Purchase (1803), and Missouri statehood (1821) shifted Ste. Genevieve from a French village to an American town, and the population grew to include English and German residents. During this period, Native American tribes including the Osage, Illini, Peoria, Shawnee, and Delaware nations had villages in the region with established trade networks between other tribes and European settlements. Villages between Ste. Genevieve and Cape Girardeau were in place until their forced removal in the 1820s.[34]

An event of historical note took place in 1811, when a significant earthquake struck along the New Madrid Faultline in Missouri in 1811 and 1812. Though it caused severe damage in other communities, Ste. Genevieve survived with little damage.

## THE BAUVAIS AND AMOUREUX FAMILIES IN STE. GENEVIEVE

### BAUVAIS FAMILY

Many of the earliest French to settle in Ste. Genevieve came from the Illinois Country via French Canada. Andre Deguire *dit* Larose was one of the first settlers in Ste. Genevieve, and, indeed, Larose is listed in the 1752 census as the principal citizen of the place. The document identifies Larose, his wife, five children, and enslaved person along with a variety of livestock, arms, and land.[35]

Among the French settlers that migrated across the river were the Vallé, Deguire, Aubuchon, Carpentier, Bolduc, Lachance and Bauvais families. The 1752 census also identified "J. B. Beauvay" as a landowner with one *volontaire*, a small holding of cattle and pigs, and one gun.[36]

The Bauvais family can trace their North American roots to 1652 when Jacques Bauvais *dit* St. Gemme and Jeanne Solde immigrated to Canada from France. Eight descendants, all first cousins of Jacques and Jeanne, arrived in Kaskaskia, in what is now Illinois, in the early 1720s. One of these was Jean Baptiste St. Gemme Bauvais *père* (father) who was born in Montreal in 1698. Kaskaskia, named after the Kaskaskia people who are now members of the Peoria nation, had long been a site of Native American settlement and land use. French settlers, including the Bauvais family, followed close on the heels of early French explorers and

31 "St. Louis & French Villages in 1836" Extract from the *Journal of George A. Bicknell* prepared by Esther U. McNitt, Indiana State Library, Indianapolis for Charles E. Peterson, May 12, 1939. Ernst Connelly Collection. Box 2, Folder Ste Genevieve History.

32 Brackenridge. *Views of Louisiana*, 127.

33 Stepenoff. *From French Community to Missouri Town.* 11, 28.

34 Stepenoff. *From French Community to Missouri Town.* 11, 28.

35 "Village Ste. Junnevieve 1752" Census record translation. Transcription accessed at https://s1.sos.mo.gov/records/archives/census/pages/territorial. Note: The transcription identifies J. B. Beauvay as owning one female enslaved person; this is incorrect. The original document identifies one *volontaire* (likely a white laborer) and no enslaved persons as part of the J. B. Beauvay household.

36 "Village Ste. Junnevieve 1752" Census record translation.

missionaries, attracted to the site by the natural resources and existing trade routes.

Among his ten children with wife Marie Louise Lacroix was Jean Baptiste Bauvais *fils* (son), who was born in 1746 in Kaskaskia. Jean Baptiste *fils* began his own family in Kaskaskia before settling permanently in Ste. Genevieve between 1789 and 1791, when he moved with his family and enslaved individuals, and partnered in several ventures with his brother, Vital.[37] The Bauvais were merchants in Kaskaskia, owned property on both sides of the Mississippi River, and were among the largest enslavers in the region.[38]

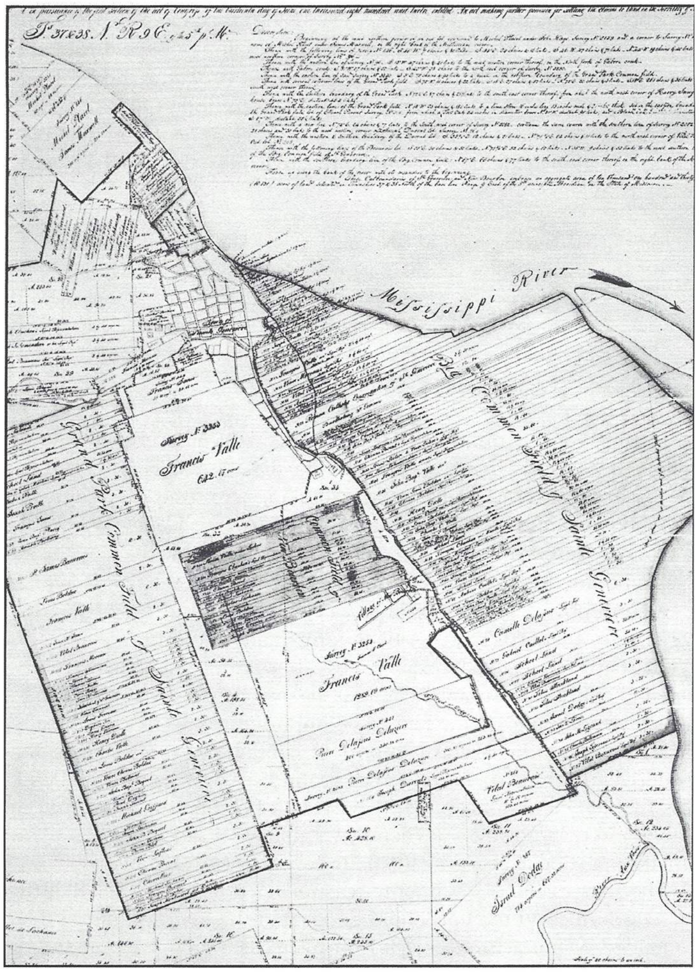



Figure DH-07. Drawing of land ownership within Ste. Genevieve including the long narrow strips associated with the Big Field (Source: Luer and Francis, Vanishing French Heritage, 26, from Ste. Genevieve Museum)

Jean Baptiste *fils* built a family residence in a traditional French Creole style of poteaux-en-terre c. 1792 in Ste. Genevieve, just south of the main village and across from the Common Field.[39] He listed the property as his primary residence and the center from which he operated several business ventures with his younger brother Vital, including the production of salt at La Saline, lead mining, and agriculture. The residence was built without a masonry foundation; the vertical eastern red cedar logs were placed directly into the ground approximately three feet deep, forming both the foundation and the exterior walls. It measured 69 by 28 feet in plan and had three interior rooms (a large *salle* or all-purpose living/sleeping room), a central hall (or trading room), and *cuisine* (kitchen). There were two stone chimneys. Physical evidence indicates that the original roof was hipped. This building type has its ancestry in Normandy, France, then Quebec, Canada, and typically had steeply-pitched hipped roofs and followed the *en filade* or linear interior plan. The roof was likely thatched and was supported by heavy timber Norman trusses. The simple rectangular plan was built with two fireplaces and no galleries. Poteaux-en-terre walls were filled with *bousillage* or *pierrotage* between the vertical members.[40] The House as originally constructed has undergone several major eras of significant alteration.[41] Though not much information is known about the setting of the original residence or surrounding buildings, information from an estate inventory in 1811 illustrates that Jean Baptiste *fils* retained the house and the lot, which included a cabin for housing enslaved persons and "several fruit trees." The lot was divided by a line running through the middle from the street and going directly towards the hills to the west. A garden and an old barn are also noted. The property was valued at $750.[42]

37 Ste. Genevieve Archives-State Historical Society of Missouri, file 117. Jean Baptiste *père* estate inventory from 1773 along with baptismal records of his children and grandchildren are in the file which help to date when the sons migrated to Ste. Genevieve. Jean Baptiste *fils*'s son J. B. Bauvais III was born in Kaskaskia in 1789 from his baptismal record from the Church of the Immaculate Conception in Kaskaskia, so on May 8, *fils* is still in Kaskaskia. Their next child, Augustin Bauvais was born in 1791 in Ste. Genevieve according to his baptismal record.; Beauvais Family history and genealogical record. Three ring binder provided by the family.

38 Jack Luer and Jesse Francis. *Vanishing French Heritage: A Complete Study of the Vertical Log Homes of the Illinois Country*. (Cape Girardeau, MO: The Kellerman Foundation for Historic Preservation, 2014) 82.

39 Richard Guyette. "Tree Ring Dating of French Colonial Vertical Log Houses in St. Genevieve, Missouri." University of Missouri – Columbia (1986 [n.d.]). Dendrochronology data developed on the residence supports the estimated construction date of c. 1792.

40 Luer and Francis. *Vanishing French Heritage*, 46-50. Bousillage was a mixture of clay or mud and straw that was supported by thin strips of wood on a diagonal between the wall logs while pierrotage consisted of flat stone pieces evenly spaced between logs to support a surface mixture of clay or lime and sand.

41 An illustrated timeline of the property provides conceptual renderings of the residence through its different building eras.

42 Estate Inventory, John B. St. Gemme Beauvais, Book D Page 26, Ste Genevieve County Courthouse, Probate Records.

A flood event that occurred during late 1811 may have impacted Ste. Genevieve, as well as the New Madrid earthquakes and aftershocks that occurred in December 1811 through February 1812. The earthquakes were felt strongly through much of the central and eastern U.S. and are considered to have been the most powerful east of the Rocky Mountains in recorded history. The Mississippi River is said to have acted like a tsunami, flowing deeply in one direction and then backwards for a time.[43] Although the earthquakes caused severe damage in other communities, Ste. Genevieve survived with little damage.[44]

Some inferences may be made regarding the configuration of the residence based on contemporary documents that described other properties in Ste. Genevieve. Henry Brackenridge provided an excellent description of another Bauvais residence (the home of Vital, Jean Baptiste's brother) in his *Recollections of Persons and Places in the West*. Brackenridge published his collection of essays and journal entries from his travels in the Illinois Country in 1810-1811. He described the Bauvais House as a long, low building with galleries in both the front and back and a central chimney that divided the House into two parts. One part served as the dining room, parlor, and principal bedroom, while the other served as the kitchen. Each side had small rooms at the ends for storage or small private chambers. He described their furniture as common with a rough table and coarse chairs. The yard was enclosed with a fence, as were many lots in the town based on descriptions from early estate inventories and deeds.[45] The fence was constructed of eight-to-ten-inch diameter cedar pickets about seven feet high with a sharpened point at the top resembling a stockade. The front yard was narrow, but the spacious back yard contained the barn, stables, dwellings where enslaved laborers were kept, and other structures. A large garden with a variety of vegetables and flowers was also enclosed with pickets. A small orchard was next to the garden. The exterior of the House was whitewashed.[46] The 1811 inventory from the Jean Baptiste *fils* house lists many of the same features described by Brackenridge and some assumptions may be made as to the yard arrangement based on his writings.

An 1825 map illustrates the arrangement of parcels along present-day St. Marys Road during the early 19th century,

Figure DH-08 Conjectural rendering of the Bauvais-Amoureux House following construction. (Source: Luer and Francis, Vanishing French Heritage, 81).

which was referred to as New Bourbon Street at the time. It intersected a road extending southeast from the village referred to as Common Field Street. Like the other parcels nearby, the Bauvais-Amoureux House parcel is shown as linear and oriented northeast to southwest. No other maps or other images survive from the 19th century to illustrate the character and composition of the Bauvais-Amoureux House, leaving only a broad understanding of features present on the parcel based on review of census and other official records.

Jean Baptiste *fils* died in 1833, and his estate was sold by court order and purchased by his son Raphael St. Gemme. The estate inventory and resulting sale documented the possessions held by Jean Baptiste *fils* at the house. Auguste St. Gemme (Raphael's brother who also lived in the House) claimed $384 against the estate for board and attendance for himself and a servant girl from November 1830 through July 1833. Raphael claimed $40 for "20 hundred rails furnished to my father the said St. Gemme Beauvais for inclosing his lot at $2.p.f." Other items described in the sale included livestock, dishware, silverware, furniture, and yards of fabric, which totaled $120. Most of these items remained in the family and were purchased by three of the sons of Jean Baptiste *fils*: Auguste, J. B. (Jean Baptiste III), or Raphael.

43 Rozier. *Rozier's History of the Early Settlement of the Mississippi Valley*, 199.

44 Fuller, *The New Madrid Earthquake*, 18-20.

45 Summary of research on estates inventories and deeds describing fences and lot enclosures in Ste. Genevieve between 1767–1820, provided by Robert Mueller on June 1, 2021.

46 Brackenridge. *Recollections*, 20-21. Brackenridge's 1811 journal identifies the family only as "M and Madame Bauvais" but names the baby "Zouzou" on page 242. Zouzou was known to be Catherine Bauvais, the youngest daughter of Vital. This is supported by James Baker's article in *Le Journal*, "Le Petit Anglais: Henry Marie Brackenridge and the Vital Bauvais Family of Ste. Genevieve, Upper Louisiana." C*enter for French Colonial Studies,* vol. 21, No. 1 Winter 2005. 1-5.

Among his other possessions were the House and lot which were sold by order of the court and purchased by Raphael. Jean Baptiste *fils* was also an enslaver, and sold with the estate were three enslaved people, described as follows:

> *Louise a mulatto girl, 20 years-$405.00*
> *Baptiste a mulatto boy-$550.00*
> *Perrine an old mulatto woman-$100.00*[47]

Raphael owned the House for only three years, and upon his death on July 17, 1836, it was purchased by his brother Auguste. August appears to have made some improvements to the property while his brother's estate was being settled. A receipt in the estate records dated January 14, 1847, documented that Auguste received $13.50 from the estate for payment to Nicolas Thomur "for making a gallery to said R. St. Gemme's house and for one load of posts making in all the above sum."[48] Such a prolonged time frame for probate was not uncommon in Ste. Genevieve at the time; historical records document that estate settlements often required multiple years and even as long as a decade.

The estate inventory confirms Auguste's personal property which included a variety of household goods, agricultural equipment, books, and furnishings. Illustrating the harsh reality of slavery, among the personal goods, such as blankets and dictionaries, were listed two men by the names of Andrew, age 64, and Moses, age 55.[49]

Another receipt was recorded against the estate for making a fence to surround the property, consistent with the common practice of fencing yards in Ste. Genevieve. Fencing was largely to keep the animals that roamed freely from damaging crops and gardens. Also recorded as part of his property were "2 mares in the woods" which were sold with the note, "if they can be found.[50]

The House underwent significant modifications around this time, most likely while still under ownership of the Bauvais family. The roof was transformed from the steep single-pitch hipped form to the broken-pitch gable roof, present today. The galleries, framed with only partially hewn poles as rafters, were added. The framing for the north gallery differs slightly from the south; at the north the rafters underwent more shaping and finishing of the members, which may indicate that the north gallery was constructed somewhat after the south, and it is unclear which gallery Auguste's receipt referenced. By this time, the roofing was likely wood shingle, and the exterior vertical log walls may have been whitewashed or plastered.[51] Reconfiguring the roof also likely required alterations within the building, possibly changing the floor plan from the linear en filade to a central hall with rooms on either side and a central fireplace.

Figure DH-09. 1825 Map of Ste. Genevieve, showing the grid plat configuration and New Bourbon Road running southeast. (Source: State Historical Society of Missouri)

Auguste and his wife Félicité Desile Leclere occupied the House until 1852, when it was purchased by Benjamin C. Amoureux.[52] The property was edged to the south and west by road rights-of-way, as well as New Bourbon Street to the east.

## AMOUREUX FAMILY

Mathurin-Michel Amoureux, the patriarch of the American branch of the Amoureux Family, was born in Bourgneuf-en-Retz, France, in 1747. He married Perrine Janvier in 1782,

47 J. B. Bauvais, St. Gemme estate inventory, Ste. Genevieve County Courthouse Probate Records, 1833 File E-377). In a note of irony, Benjamin C. Amoureux signed all these documents as a clerk of the court. Amoureux would later purchase the House and live there with his family in 1852.

48 Raphael Bauvais estate inventory, Ste. Genevieve County Courthouse Probate and Estate Records.

49 Raphael Bauvais estate inventory, Ste. Genevieve County Courthouse Probate and Estate Records.

50 Raphael Bauvais estate inventory, Ste. Genevieve County Courthouse Probate and Estate Records.

51 Guyette.

52 Estate of Raphael St. Gemme Bauvais. Ste. Genevieve County Courthouse Probate Records, Book E page 377; Sale to Benjamin C. Amoureux , Ste. Genevieve County Courthouse Probate Records, 1852 Book E page 377.

and together they had five children.

The Amoureux were part of a family of wealthy merchants in Lorient, France, who fled the political unrest during the French Revolution and immigrated to the United States in 1793. The family was separated for some time during their resettlement but eventually reunited and settled in Frankfort, Kentucky. Here, their son Benjamin Clement was born on November 17, 1797. He was the youngest of the children and the only child born in the United States.

The family relocated from Frankfort to New Madrid in Upper Louisiana (now Missouri), a little more than 100 miles south of Ste. Genevieve, and Mathurin served as a judge on the Court of Common Pleas, a Probate Judge, a Justice of the Peace, and was an active merchant. By 1812, the family had permanently settled in Ste. Genevieve.[53]

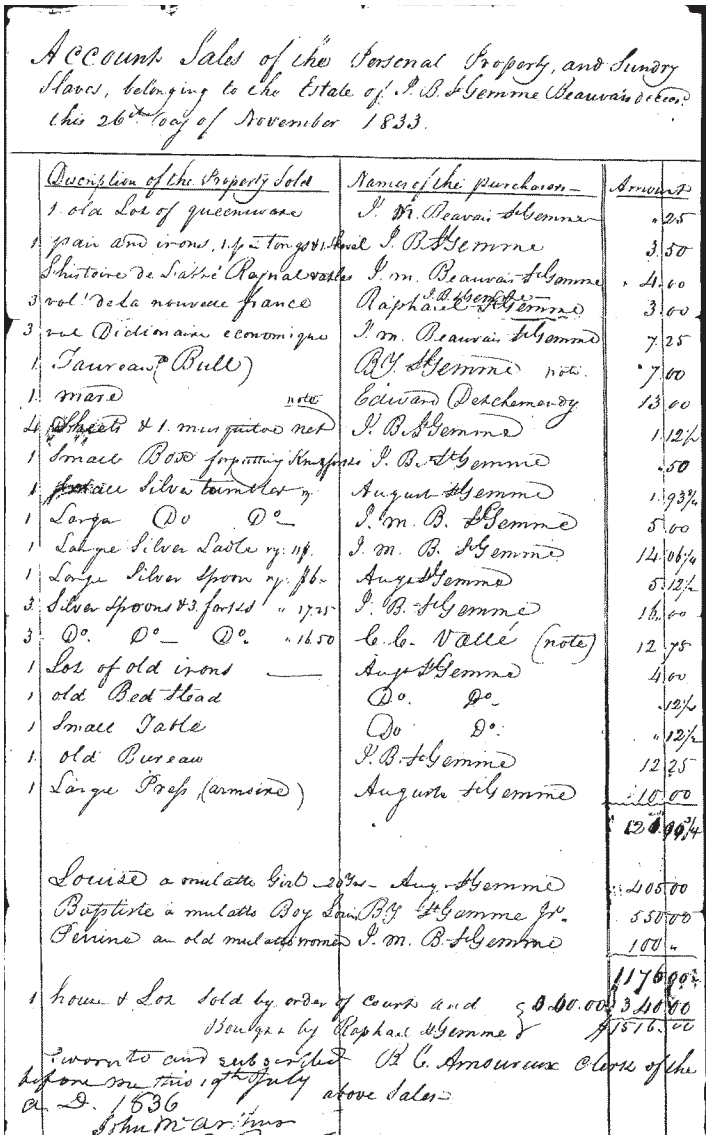
## Benjamin Amoureux

Benjamin Amoureux's life in Ste. Genevieve is well documented in the historical records, beginning in the 1830s when he was living in a household with his brothers Joseph and Julien, along with several others. He was listed as a farmer in census records, while his brother Joseph was listed as a merchant.[54] As an unmarried man in his early 30s, he began a relationship with Pélagie, a woman enslaved by Vital and Félicité Bauvais.

Benjamin was deeply involved in the community, active in both civil and private pursuits. He bought and sold land in and around Ste. Genevieve and New Bourbon in the 1840s and held many different public and private positions including Justice of the Peace, Estate Administrator, and Road Commissioner.[55] Benjamin maintained an active life as a public servant and farmer until his death in 1878.

## Pélagie (Vital) Amoureux

Pélagie was born on September 21, 1805. She was baptized in the Catholic Church of Ste. Genevieve on October 20, 1805, and her baptismal record identified her as an *esclave*, or slave, and as a "mulatress." She was enslaved by Joseph Vital Bauvais was a wealthy property owner and brother to Jean Baptiste *fils* who built the House in c. 1792 When Vital Bauvais died in 1817 at the age of 77, Pélagie's enslavement continued under his widow Félicité (Janis) Bauvais who inherited much of the estate, including Pélagie and five other



Account Sales of the Personal Property, and Sundry Slaves, belonging to the Estate of J. B. St Gemme Beauvais deceased this 26th day of November 1833.

| | Description of the Property Sold | Names of the purchasers | Amount |
|---|---|---|---|
| | 1 old Lot of queensware | J. M. Beauvais St Gemme | .25 |
| 1 | pair and irons, 1 pair tongs & 1 shovel | J. B. St Gemme | 3.50 |
| | Histoire de L'abbé Raynal vables | J. M. Beauvais St Gemme | 4.00 |
| 3 | vol. de la nouvelle France | Raphael St Gemme | 3.00 |
| 3 | vol. Dictionaire economique | J. M. Beauvais St Gemme | 7.25 |
| 1 | Taureau (Bull) | B. Y. St Gemme note | 7.00 |
| 1 | mare | Edward Detchemendy | 13.00 |
| 4 | Sheets & 1 musquitoe net note | J. B. St Gemme | 1.12½ |
| 1 | Small Box for putting Knife forks | J. B. St Gemme | .50 |
| 1 | Small Silver tumbler | August St Gemme | 1.93¾ |
| 1 | Large Do Do | J. M. B. St Gemme | 5.00 |
| 1 | Large Silver Ladle | J. M. B. St Gemme | 14.06¼ |
| 1 | Large Silver Spoon | Aug St Gemme | 5.12½ |
| 3 | Silver Spoons & 3 forks " 17.25 | J. B. St Gemme | 16.00 |
| 3 | Do. Do Do. " 16.50 | C. C. Vallé (note) | 12.75 |
| 1 | Lot of old irons | Aug St Gemme | 4.00 |
| 1 | old Bed Stead | Do. Do. | .12½ |
| 1 | Small Table | Do Do. | .12½ |
| 1 | old Bureau | J. B. St Gemme | 12.25 |
| 1 | Large Press (armoire) | Augusta St Gemme | 10.00 |
| | | | 120.00¾ |
| | Louise a mulatto Girl 20 yrs | Aug St Gemme | 405.00 |
| | Baptiste a mulatto Boy Louis | B. Y. St Gemme Jr. | 550.00 |
| | Perrine an old mulatto woman | J. M. B. St Gemme | 100.– |
| | | | 1176.00¾ |
| 1 | house & Lot sold by order of Court and Bought by Raphael St Gemme | $340.00 | 340.00 |
| | | | $1516.00 |

Sworn to and subscribed before me this 19th July A. D. 1836 John M. Arthur

B. C. Amoureux Clerk of the above Sales

Figure DH-10. Account of Sales Document (Source: Estate Records of J.B. St. Gemme Bauvais, Ste. Genevieve County Courthouse, E-377.)

enslaved family members. These individuals included:

*Baptiste dit Manyan, age 60*
*Clement, age 18*
*Antoine dit Frere, age 22*
*Marie Jeanne, age 50*
*Odile, age 17*
*Pélagie, age 11*

53 "To George Washington from Mathurin-Michel Amoureux, 10 November 1794," Founders Online, National Archives, https://founders.archives.gov/documents/Washington/05-17-02-0109.; Leola Duckett, Amoureux Family History and Amoureux Family tree at http://www.ancestry.com

54 U.S. Census Records, Ste. Genevieve, Missouri 1840 and 1850.

55 Ste. Genevieve Archive. Collection 3636. Summary of multiple documents in folders from the collection.

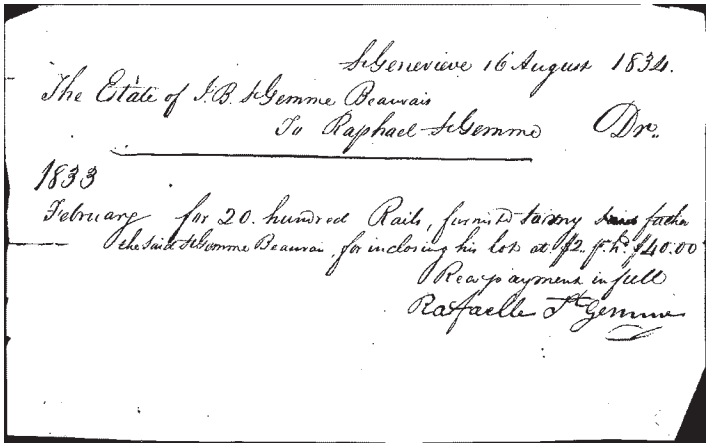

St Genevieve 16 August 1834.
The Estate of J.B. St Gemme Beauvais
To Raphael St Gemme Dr.
1833
February for 20. hundred Rails, furnished to my said father
the said St Gemme Beauvais, for inclosing his lots at $2. p.h. $40.00
Recd payment in full
Rafaelle St Gemme

Figure DH-11. Reimbursement for fence rails (Source: Estate Records of J.B. St. Gemme Bauvais, Ste. Genevieve County Courthouse, E-377.)

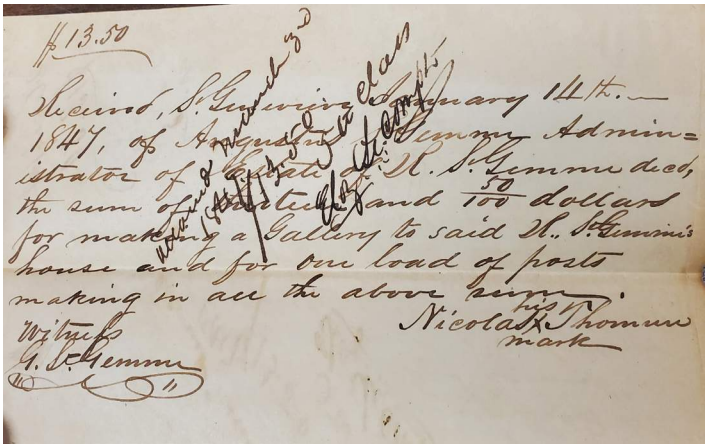

$13.50
Received, St Genevieve January 14th 1847, of Augustus St Gemme Administrator of Estate of R. St Gemme decd, the sum of thirteen and 50/100 dollars for making a Gallery to said R. St Gemme's house and for one load of posts making in all the above sum.
Witness
G. St Gemme
Nicolas his mark Thomure

Figure DH-12. Reimbursement for "thirteen and 50/100 dollars making a Gallery to said R. St Gemme's house and for one load of posts making in all the above sum." (Source: Estate Records of J.B. St. Gemme Bauvais, Ste. Genevieve County Courthouse, E-377.)

Pélagie's other twelve family members were separated and given to various Bauvais siblings. While enslaved to the Beauvais family, Pélagie likely lived in a separate dwelling on the property. When she was 25 in 1830, she and Benjamin Amoureux had their first child Felix. In 1832, Pélagie gained freedom for herself and her young son Felix from Félicité Bauvais.

Pélagie was required to register as a free individual at the

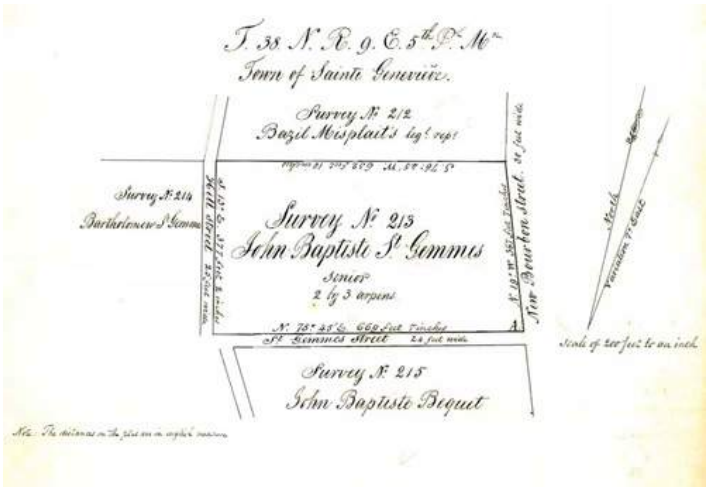



Figure DH-13. 1845 Survey showing the St. Gemmes property along New Bourbon Street. The survey shows a road to the south of the parcel indicated as St. Gemmes Street as well as another to the west. (Source: St Genevieve County Courthouse deed records)

Ste. Genevieve Courthouse in order to remain free, but was required to resubmit her deed of emancipation in 1860, along with 12 other free people of color in Ste. Genevieve, were required to register with the government. *The Registry of Free Negroes and Mulattoes licensed by Ste. Genevieve County*, dated July 18, 1836, documented Pélagie Vital (the surname given to her likely based on her enslaved status)[56] as a "mulatto woman, 33 years old, five feet four inches high and a defective nose."[57] In 1860, Pélagie had to recertify in court that she and her son Felix had been manumitted in 1832.

Pélagie lived a remarkable life. Author and professor, Bonnie Stepenoff described her life as an "example of a lifelong struggle for freedom and personal dignity by a black woman in a slave society."[58] She is documented in the historic record through lawsuits she filed in Ste. Genevieve against three different men for harassment, an unusual action at the time by any women, much less a formerly enslaved woman of color.

## Pélagie and Benjamin

Pélagie and Benjamin had seven children together between 1830 and 1841. Their children were Joseph Antoine Felix (called Felix) born 1831, Joseph Antoine born 1833 (called

56 See "It's in the Name" for additional discussion.

57 "Becoming a Free Woman." http://amoureuxhouse.org/timeline, Accessed May 4, 2021.

58 Stepenoff, *From French Community to Missouri Town*, 115.

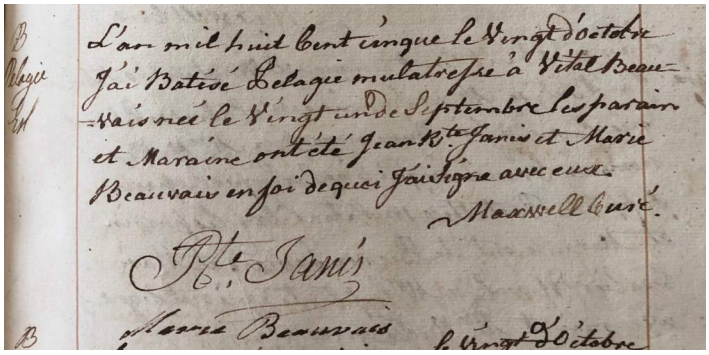


Figure DH-14. Pélagie's baptismal record from 1805:

The year one thousand eight hundred and five on the twentieth of October
I baptized Pélagie, mulatress of Vital Beauvais born the Twenty-first of September. The godfather and godmother were Jean Baptiste Janis and Marie Beauvais. In witness whereof, I sign with them.
Father Maxwell
[Translated from French]

(Source: Ste. Genevieve Catholic Church Records, Baptisms 1786-1820, Reel 1: 710-951)

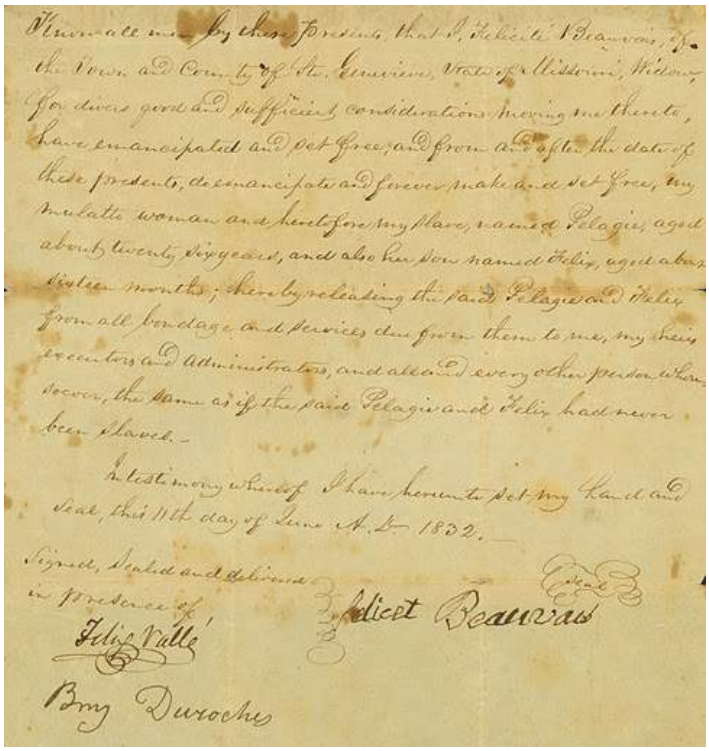


Figure DH-15. Pélagie's emancipation document, freeing her and her son Felix from enslavement to Félicité Beauvais. Interestingly, this legal document is written in English while the language of the Church remained French for many years after statehood..

Joseph), Jean Baptiste Joseph Amable Benjamin (called Amable) born 1835, Marie Félicité Heloise born 1837, Marie Félicité Philomène born in 1838, Mary Therese Clara born 1841, and François Emil (called Benjamin) born in 1844. Benjamin Amoureux purchased the former Bauvais residence in 1852 for his family. The 1860 census lists Benjamin as the head of a multi-generational household which included his wife Pélagie, four of their five surviving children, eldest son Felix's wife Mary Boyton, and their two children. Benjamin's occupation is given as "Farmer," although he held a number of public servant positions at the time, in addition to his agricultural holdings.

The 1860 agricultural census for the City of Ste. Genevieve shows that Benjamin had 75 acres of land valued at $1,000, with livestock holdings which included horses, cows, pigs, and sheep. Additionally, he reported stockpiles of peas, beans, potatoes, and butter. He also notably reported $100 of produce from orchards owned by the family; only three other families reported that much produce value in Ste. Genevieve, suggesting his orchards were successful and productive. In 1878, Benjamin died after receiving the last sacrament from his priest on January 21. Pélagie remained in the house with her family until her death in 1890.

While a detailed biography of the Amoureux family is beyond the scope of this report, a wealth of historic documents have been found regarding their lives which provide a fascinating and valuable window into the triumphs and challenges faced by a mixed-race family in mid-19th century Missouri. Further research into the Amoureux family and other mixed-race families in the context of the African-American experience in Ste. Genevieve is needed.

## 1868 - 1923

The Amoureux family owned and occupied the house through 1923, with Felix acquiring ownership in 1860. The 1880 agricultural census described Felix's assets as including 50 acres of tilled land, eight acres of meadow or pasture, and 15 acres of woodland or forest. He had five horses and two mules, three "milch" (or milk) cows, sheep, 30 pigs, and 42 chickens along with 50 pounds of butter. His farm including land, fences, and buildings, was valued at $2,450, and the livestock value was in addition to that. This number of resources required outbuildings and pens, but the historic record does not document the location of these associated resources or whether any were present on the same parcel of

| DATE | RECORD FROM STE. GENEVIEVE COUNTY COURTHOUSE | SUMMARY OF TRANSACTION AND DESCRIPTION FROM RECORD BOOK |
|---|---|---|
| April 19, 1859 | Deed of Trust between Benjamin C. Amoureux and Fidel and Felix Hettig<br><br>Deed Record Book D, pg 532, Ste. Genevieve County Courthouse | In consideration of the debt and for $1.00 property bounded east by New Bourbon Street, south by Ste. Gemme's Street containing six arpents and being the same ltand confirmed to J.B. St. Gemme senior and afterwards purchased by Ausut Ste. Gemme as by reference to the record and then sold to Benjamin C. Amoureux in the deed dated 12th September 1852 and with a promissory note from Benj. C. Amoureux to Felix Hettig in words and figures as follows to $800, 12 months after date of promise to pay Felix Hettig. |
| October 5, 1859 and November 24, 1859 | Legal Judgment against Benjamin C. Amoureux<br><br>Books M page 532 and N page 421, Ste. Genevieve County Courthouse | The sheriff of the county seized "all the right, title, interest, and estate of the said Benjamin C. Amoureux" on November 24, 1859, and listed was the six-arpent lot on which the house was located and second, smaller parcel. After 20 days notice, the property was put to public auction and J. Felix St. James was the highest bidder for the price of $100.00 on April 3, 1860 |
| April 20, 1860 | Quitclaim Deed between J. Felix St. James and Felix Amoureux<br><br>Book N page 425 | Felix paid $150 to St. James in turn for the quit claimed of the lot in the city of survey no. 213 confirmed to John Bte. St. Gemme containing six arpents. |
| September 13, 1860 | Mortgage Deed between Felix Amoureux and Jacob Stuppy<br><br>Book O page 99 | Felix Amoureux borrowed $2,400 from Jacob Stuppy and used the six arpents of land and a separate 40 acre tract of land as security. |
| June 17, 1862 | Deed of sale between Fidel Hettig and Jacob Stuppy<br><br>Book P, page 308 | Referring back to the 1859 loan between Benjamin Amoureux and Fidel Hettig, since Amoureux did not make payments to Hettig, Hettig had sought relief through a sheriff auction of the House. This transaction cleared the chain of title from Hettig to Stuppy. |
| June 19, 1862 | Note of Agreement for five year term between Felix Amoureux and Jacob Stuppy<br><br>Book P, page 310 | Jacob Stuppy initiated the agreement to ensure that his initial $2,400 loan would be paid back by Felix in addition to the $600 he had to pay for the land's return. Once paid in full, the land would convey to Felix |
| May 13, 1868 | Warranty Deed between Jacob Stuppy and Felix Amoureux<br><br>Book S page 788 | Land is conveyed to Felix for a final $1,400 payment. |

Figure DH-16. c. 1900 photograph, looking at the north elevation from the northwest, showing a wood picket in a state of disrepair and loose siding boards on the west wall. (Source: Felix Vallé House State Historic Site, vertical file for the Beauvais-Amoureux House)

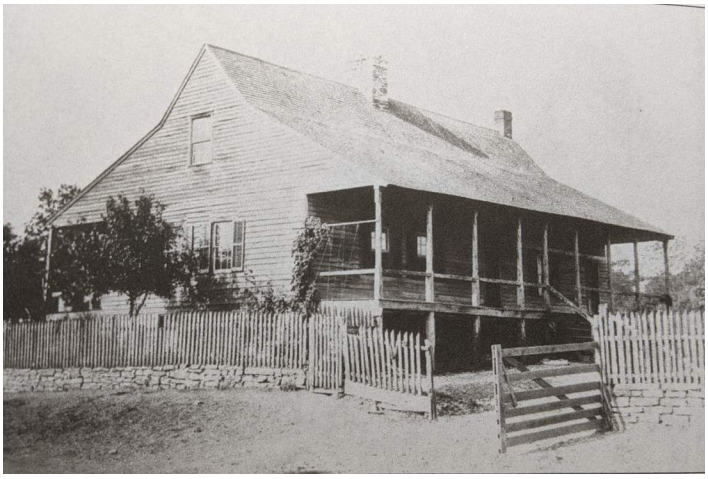


Figure DH-17. c. 1900 photograph, looking at the north elevation from St. Marys Road, showing the parcel edged by a stone wall along St. Marys Road , wood picket fencing, a gate at the road leading along the north side of the house, and the north porch with a stair leading to the road. A tree is in the yard east of the house. (Source: *Ste. Genevieve: Images of America,* p. 24, original source undetermined)

Figure DH-18. c. 1910 or possibly 1916 photograph, looking at the north elevation from St. Marys Road. Note the repairs to the stone wall and picket fence, a new gate, new lattice skirting around the north gallery, and the central chimney has been replaced with brick. (Source: Missouri State Historical Society, https://mohistory.org/collections/item/N38681)

land as the House.[59]

It is likely that significant changes were made to the House under Felix's ownership. At a yet unconfirmed date but possibly in the 1880s, the west end of the House was reconstructed. The vertical logs of the exterior wall, west chimney, and the first Norman truss were removed, permanently shortening the structure. The west wall was reconstructed as a wood frame filled with brick nogging, bearing on a limestone foundation. A new brick chimney was also constructed inboard of the west wall. At the east end wall, the poteaux-en-terre construction was also modified to sit on a wood sill bearing on a new limestone foundation. These modifications are visible in the early photographs included with the HABS records and were likely performed to address deterioration of the vertical logs at the east and west foundation walls, and potentially deterioration of the roof hip truss at the west.[60]

The roofing was likely wood shake, and the exterior vertical log walls may have been whitewashed, plastered, or had wood weatherboard siding.[61] Reconfiguring the roof also likely required alterations within the building, possibly

59 United States Census, Agricultural schedule, Ste. Genevieve County, Missouri, 1880.

60 Amoureux House, 327 St. Marys Road, Sainte Genevieve, Ste. Genevieve County, MO (photographs, measured drawings, written historical and descriptive data), Historic American Building Survey, National Park Service, U.S. Department of the Interior, https://www.loc.gov/item/mo0247.

61 Richard Guyette. "Tree Ring Dating of French Colonial Vertical Log Houses in St. Geneviève, Missouri." University of Missouri – Columbia (1986 [n.d.]).

Figure DH-19. C. 1936 photo showing the east facade and south porch, with an overhead electrical line along the road. A fencepost appears south of the house. A portion of the stone wall along the road remains visible. A crank-handled pump and sheet metal cover are visible in association with the well or cistern inside the fence. (Source: HABS)

Figure DH-20. C. 1936 image of the west and south walls edged closely by a fence to the south. A house is visible to the left (north). (Source: HABS)

Figure DH-21. View west toward the east facade c. 1937 showing the north and south porches, the sloped embankment along the road. Electrical lines parallel St. Marys Road. (Source: HABS)

Figure DH-22. C. 1936 photo of the south facade showing the porch column of the adjacent residence, and a fence between the two. A walnut or ash tree is along the road. (Source: HABS)

changing the floorplan from the linear en filade, to a central hall with rooms on either side and a central fireplace.

Upon Felix's death in 1910, the property, ownership of the residence, and his holdings in the Common Field were subdivided among his children.[62] Felix's son Francis Boynton Amoureux (called Boynton) lived in the house with his wife Alice, and in 1915, the 20-foot-wide drive south of the house was sold to Edward Moreau. On August 20, 1923, Boynton sold the House and the rest of the property in 1923 to William and Elizabeth Gisi.[63]

## 1923 to present

The period of significance for the House ends in 1923 when the house passed out of Bauvais-Amoureux ownership for the first time since its construction in c. 1792. The Gisi family purchased the residence in 1923, but William Gisi was killed in an explosion the following year, leaving behind his two children (aged one and three) and his wife Elizabeth Bahr.[64] Elizabeth remarried Anthony Jacob in 1927 and they built a new house on the land immediately south of the Bauvais-Amoureux House. The land was likely subdivided to accommodate the new residence, and they rented out the old house.

It is unlikely that any significant renovations occurred at the house from the time Felix Joseph Amoureux died in 1910 through the Gisi-Jacob's ownership of the property. By the 1930s, when HABS documented the building, photographs indicate the east, west, and north walls were covered with wood siding, the south wall remained plastered, and the roofing was replaced with corrugated metal panels, which was common practice in Ste. Genevieve at that time. The wood stairs to the grenier as seen in a 1937 HABS photo appear to be the stairs still in place. Based on the HABS photos from the 1930s-1940s, the House appeared to have been in a state of disrepair. HABS also prepared measured drawings of the House in 1956, which documented a different construction of the south gallery posts than is present today and show that the north gallery was not yet enclosed.[65]

Also included in the collection of HABS photographs is an image of a small cabin or shed in poor repair. This photograph is not listed in the image index for the collection. A frame house can be seen in the far right background of the image, and behind this house is the south wall of the Janis-Ziegler House (the Green Tree Tavern). The frame house is still standing at 284 St. Marys Road, placing this cabin on a now empty parcel north of Seraphin Street, approximately one-quarter mile north of the Bauvais-Amoureux House. It is unknown if this cabin was associated with the Amoureux family in the 1930s, or if the image was simply misfiled.

# INTERPRETATION AND COMMEMORATION

Norbert and Frances Donze purchased the Bauvais-Amoureux House from the Jacobs in 1963. The Donzes were important to Ste. Genevieve because of their early and influential historic preservation ethic. They converted the House to a museum and shop and constructed a vertical log gift shop immediately adjacent to the residence. Frances Donze was active as the chair of the Ste. Genevieve Tourist Bureau and organized a committee to pursue the renovation of many of the old buildings in order to attract visitors to what was advertised as the oldest settlement west of the Mississippi River. The group received a technical assistance grant from the Area Redevelopment Administration for $30,000 to support this pursuit.[66] Their purchase and interpretation of the House coincided with a deliberate effort at planning, tourism, and historic preservation across the community. Community-wide surveys and investigations of the historic properties were undertaken, and a historic preservation plan created to guide the effort.[67]

The Donze's preservation efforts included their sons Michael and Jack who also worked at the property. Michael stacked wood for the fireplace year-round, as it was the main heat source for the museum.

Conversations with the brothers indicate that their parents enclosed the back or north gallery in the early 1960s, soon after acquiring the building, in part to accommodate Frances Donze's antiques, which were displayed for sale on shelves built into the north wall window openings. Michael also remembers a few old fruit trees behind the House where the driveway curved around the property. They also may have dug out the caveau to store root crops. They would cut ice

62 Felix Joseph Amoureux Last Will and Testament, June 25, 1909. Ste. Genevieve County Courthouse, Book 72 Page 154.

63 Personal Property Tax Book for Ste. Genevieve County. 1900-1923 on microfilm at Ste. Genevieve Public Library.

64 "William Gisi Loses Life In Explosion." *The Perry County Sun* (Perryville, Missouri: September 11, 1924) 1.

65 Historic American Building Survey, 1937 and 1956.

66 "Ste. Genevieve to get ARA Help on Restoration." The Daily Journal (Flat River, Missouri; 14 December 1964) 1.

67 "Modern Planning in an Old town: Federally Sponsored Study Aims at Both Progress and Restoration in Ste. Genevieve." *St Louis Post-Dispatch* (St. Louis, MO: 16 July 1967) 48.

Figure DH-23. Photograph from the Donze era. (Source: From the Donze family collection.)

Figure DH-24. Photograph from the Donze era. (Source: From the Donze family collection.)

from the frozen river, carry it to the caveau, and pack items in sawdust for refrigeration. The Donzes added the flagstone walk from the basement entry to St. Marys Road. They also replaced much of the wood on the south porch because so much was decayed when they acquired the property. Modifications were made to the interior, including the addition of a lavatory at the northwest corner of the house and removal of a mid-19th century partition wall in the main room. The vertical log gift shop, a separate structure built immediately west of the House, has since been demolished, but the footprint of the concrete foundation is still in place.

In 1993, the Missouri and Mississippi Rivers experienced catastrophic flood levels. Although damage to Ste. Genevieve proper was limited by emergency measures; the caveau of the Bauvais-Amoureux House was flooded. The flooding exacerbated differential settlement issues at the first floor and attic floor. In response, shoring was installed in the caveau, which is still in place to support the first-floor structure. Although some evidence of settlement in the attic floor can be seen in 1986 HABS photos, the settlement is significantly more pronounced today. The Donzes maintained the property as a visitor attraction until 1994, when the Friends of Vieilles Maisons Françaises purchased the Bauvais-Amoureux House and donated it to the State of Missouri. Missouri Department of Natural Resources (DNR) managed it as part of the Felix Vallé State Historic Site.

The Missouri DNR began to research and investigate the properties they acquired and conducted an archeological study in 1996. The study uncovered a penny dated 1862 in soil fill just west of the existing wall, which provides a "no earlier than" date but cannot be used to conclusively date the existing west wall without further archeological study.

Figure DH-25. Photograph from the Donze era. (Source: From the Donze family collection.)

The west end wall was reconstructed with a mix of circular and vertically-sawn lumber. Circular-sawn lumber was available in the mid-1800s, particularly along the Mississippi River. However, the construction of the east end wall with hand-hewn pole framing and cut nails is consistent with the construction of the galleries, indicating that a later construction date can be applied to the west wall with some confidence.

Under the Missouri DNR's stewardship, other maintenance projects were undertaken, including replacement of the exterior siding and roofing with new cedar products in

2007. In 2001, The Bauvais-Amoureux House was listed as contributing to the Ste. Genevieve Historic District. The first bill for a feasibility study for establishing a National Park unit at Ste. Genevieve was also introduced at the state level. Bills were later introduced in 2003 and 2005. The study was finally completed in 2016 and a bill introduced at the federal level to establish a park. Also in 2016, Wilma Gisi Zarinelli sold the house on lot #4 to Henry Johnson. In 2018, the NPS acquired the House along with other historic properties to form the Ste. Genevieve National Historical Park in 2020.

Figure DH-26. The Bauvais-Amoureux House underwater during the Great Flood of 1993. (Source: Bill Nager, *Ste. Genevieve: A Leisurely Stroll Through History*, p. 151)

# Statement of Significance

## CONTEXT FOR ESTABLISHING SIGNIFICANCE

### 1960 / 1970 National Historic Landmark District

In 1960, the Ste. Genevieve National Historic Landmark District was recognized for the national significance of its collection of extant French vernacular vertical log architecture and was designated under the theme of "French Exploration and Settlement." As one of the earliest NHL districts, the nomination specifically identified only eight structures believed to have 18th century construction dates but established no specific period of significance. When the NHL district nomination was revised and expanded in 1970, the district boundaries were established, and the number of contributing resources was kept at eight but slightly revised to include the Bauvais-Amoureux House (called the "St. Gemme-Amoureux House").

### 2002 National Register District

The 2002 designation of the Ste. Genevieve National Register District included overlap with the 1960 / 1970 NHL district but was generally broader to encompass buildings also significant at the state and local level. The National Register district was nominated under the following criteria:

- Criterion A (Event) in part for association with an "ethnically diverse population including French, Anglo-Americans, African Americans, and Native Americans."
- Criterion C (Design/Construction) in part for its "French vertical log architecture" that "represents the early French and French Canadian settlement of the community."
- Criterion D (Information Potential) in part for the "potential for significant archeological deposits" related to the "French, German, Anglo-American and African American communities." (Note: The National Register nomination does not identify pre-European or Native American resources under this criterion as the majority of these resources are located outside the district boundaries.)

The period of significance for the National Register district was given as 1790 – 1951, approximately the founding of "New Town" Ste. Genevieve to the minimum age requirement of 50 years at the time of nomination. The Bauvais-Amoureux House (called the "Jean Baptiste St. Gemme Beauvais House") is listed as resource number 93.

## 2016 Special Resource Study

Public Law 109-319, the Ste. Genevieve County National Historic Site Study Act of 2005 tasked the NPS with studying the historic resources of Ste. Genevieve for potential inclusion in the national park system. The study culminated in a 2016 report that found the Ste. Genevieve district to be nationally significant under the following criteria:

- Criterion 4 (Architecture) for the district's "large and rare collection of French vernacular vertical log houses."
- Criterion 1 (Broad Patterns of United States History) for French colonial settlement, which also includes reference to the vertical log structures. Included also under this criterion is a discussion of the ethnic diversity of Ste. Genevieve, stating: "The richness of the town's cultural heritage is further amplified by the fact that several French vertical log houses had owners and occupants who were free people of African heritage in the years before the Civil War ended slavery in the United States."

The Special Resource Study identified a period of significance for the district of 1750 – 1846, approximately the founding of "Old Town" Ste. Genevieve to the construction date of the last French vertical log structure in New Town.

## 2018 Ste. Genevieve National Historical Park

In 2018, Ste. Genevieve National Historical Park was established as the 422nd Unit of the National Park Service. Though precise dates for significance are not associated with the federal acquisition of properties, the Ste. Genevieve National Historical Park enabling legislation was authorized by the Consolidated Appropriations Act of 2018 on March 23 to "preserve, protect, and interpret for the benefit of present and future generations the themes of French settlement, vernacular architecture, and community form and farming on the frontier associated with Ste. Genevieve.[68]

## 2021 Archeological Overview and Assessment

This report identifies a timeframe of c. 1770 – 1860 as the period of significance, representing the major time of "French influence and associated cultural expressions" in Ste. Genevieve.

The report emphasizes the importance of investigating the "archeology of race and race relations" at the Bauvais-Amoureux House (called "Amoureux House"), citing the importance of the story of Pélagie Amoureux to the context of freed African Americans in pre-Civil War Missouri and the ethnic diversity of Ste. Genevieve.

# SIGNIFICANCE OF THE BAUVAIS-AMOUREUX HOUSE

## Criterion C (Design/Construction)

The Bauvais-Amoureux House is primarily significant under National Register Criterion C, at the national level, for embodying the distinctive characteristics of a late 18th-century French vernacular vertical log structure in the poteaux-en-terre style. As one of only five known extant poteaux-en-terre structures in North America, the Bauvais-Amoureux House is a rare example of this construction methodology. Alterations made during the period of significance include construction of the north and south porches (or galleries), modification of the east wall foundation, and reconstruction of the west wall. With these changes, the current building form from the c. 1847 - c. 1852 time period is intact and envelopes the c. 1792 construction. The house retains a high level of integrity of the original c. 1792 fabric including the post-in-ground vertical logs and Norman truss roof structure, as well as modest levels of integrity for the fabric of the nineteenth century alterations.

## Criterion A (Event)

The Bauvais-Amoureux House is also significant under National Register Criterion A, at the national level, for its contribution to the patterns of French colonial settlement, as well as to African American ethnic heritage in Ste. Genevieve. The house plays an important role as one of several sites that tells the story of African American history and culture in the eras immediately before and after the Civil War, including the challenges faced by freed persons, race relations and the struggle for social equality, and the complex nature of mixed-race relationships.

## Criterion D (Information Potential)

The Bauvais-Amoureux House is also significant under National Register Criterion D, at the local level, for its potential to contribute our understanding of human history and prehistory. Colonial and Pre-Civil War era deposits are believed to be present at the site. This criterion should be revisited after completion of further archaeological study.

68 National Park Service. Ste. Genevieve National Historical Park Legislation and Map. https://parkplanning.nps.gov/docu-ment.cfm?parkID=155&projectID=31496&docu-mentID=86827, accessed 3 May 2021.

## PERIOD OF SIGNIFICANCE

The period of significance for the nationally significant historic district in Ste. Genevieve begins about 1750 with the establishment of the town and extends through 1846 when the last vertical log house was built in the new Ste. Genevieve.[69] This temporal boundary encompasses the significant archeology of the original townsite as well as the built environment. The National Register of Historic Places Ste. Genevieve Historic District nomination identifies the period of significance as 1790 to 1951. This period begins with the construction of the oldest buildings in the district and extends to the 50-year recommended cut-off date (from the time written in 2001) as established by the National Register. The nomination incorporates discussions of all aspects of the history of the community and architectural styles including ranch houses.

Though precise dates for significance are not associated with the federal acquisition of properties, the Ste. Genevieve National Historical Park enabling legislation was authorized by the Consolidated Appropriations Act of 2018 on March 23 to "preserve, protect, and interpret for the benefit of present and future generations the themes of French settlement, vernacular architecture, and community form and farming on the frontier associated with Ste. Genevieve."[70]

This historic structure report is specific to the Bauvais-Amoureux House and recommends a period of significance that begins in 1792, the presumed construction date of the House by Jean Baptiste St. Gemme Bauvais, and extends through 1923, the year Frank Boynton Amoureux sells the House. Frank was the grandson of Pélagie and Benjamin Amoureux and the last Amoureux family member to occupy the House. Between the years of 1792 and 1923, the House effectively had only two family occupants: the Bauvais Family and the Amoureux Family.[71] These two families formed much of the significant history of the House. Its exceedingly rare architectural style and evolution from its construction through 1852 is credited to the Bauvais Family. Physical features to their credit include a possible new roof configuration, galleries surrounding the House, fencing, and outbuildings (no longer extant). Under Amoureux ownership the residence continued its evolution with a new footprint when the west end was removed as well as corresponding interior alterations. Additionally, their family story and its significance, as well as the supporting documentation, represents important events in American history worthy of interpretation.

Beyond the architectural fabric, the proposed period of significance from c. 1792 – 1923 takes into consideration the major themes identified by previous documents: patterns of French settlement and African American Ethnic Heritage.

69 New Ste. Genevieve is known as the current town site that replaced the first French village that was closer to the river. The original townsite was significantly damaged after a disastrous flood in 1785 resulted in the gradual relocation of the town.

70 National Park Service. Ste. Genevieve National Historical Park Legislation and Map. https://parkplanning.nps.gov/document.cfm?parkID=155&projectID=31496&documentID=86827 accessed 3 May 2021.; National Register nomination.

71 Though the house legally changed hands several times as is documented in previous text and the property timeline, it effectively remained in the hands of these two families for 131 years from 1792 to 1923. Following the death of Jean Baptiste *fils* in 1811, his sons inherited the property and remained there until 1852 when it was sold to Benjamin Amoureux. Amoureux and his wife Pélagie raised their children in the House and it remained occupied by Amoureux family members until Felix's death in 1923.

# The Question of the Galleries

Was the Bauvais-Amoureux House originally constructed with galleries? This historic structure report hoped to provide a definitive answer to this important question through the detailed physical investigation and the historical research. Historical sources and French vernacular building practices of the time suggest that the house would likely have had galleries; however, the physical evidence remains inconclusive.

Many of the vertical log structures in Ste. Genevieve have clear physical evidence that they were originally constructed with galleries, including the Bequette-Ribault House (c. 1807), Louis Bolduc House (c. 1793), Janis-Ziegler House (Green Tree Tavern) (c. 1800), and the Guibourd-Vallé House (c. 1807); all of which were visited in the course of preparing this report. There are significant differences in the top of wall construction between these structures and the Bauvais-Amoureux House. These framing techniques, while different, all involve some physical evidence that would support the existence of galleries on one or all sides if the original gallery structures were to be removed.

- At the Louis Bolduc House, the gallery joists are pinned in place through mortises in the vertical logs *(Figure GL-01)*. The tenon end of the joists are visible in the attic because the ceiling beams sit at a much lower elevation than the top of the log walls *(Figure GL-02)*.
- At the Bequette-Ribault House, the gallery joists are also pinned in place with a wood trenail through a tenon, but the joist bears in a notch on the side of the vertical log rather than a mortise pocket *(Figure GL-01)*.
- The Guibourd-Vallé House galleries are framed similarly to the Bolduc House *(Figure GL-03)*. Additionally, the galleries at the north and south end walls were permanently removed at some point in the past, and the abandoned mortises in the vertical logs are still in place as evidence that gallery framing once existed.
- Although constructed within a few years of both the Bolduc and Bauvais-Amoureux Houses, the framing of the Janis-Ziegler House (Green Tree Tavern) differs greatly from both. The top plate here is a double member that sandwiches the bearing ends of the ceiling beams and gallery joists; however, the plates are not tightly fit like at the Bauvais-Amoureux House, creating a gap between the upper and lower members *(Figure GL-04)*.

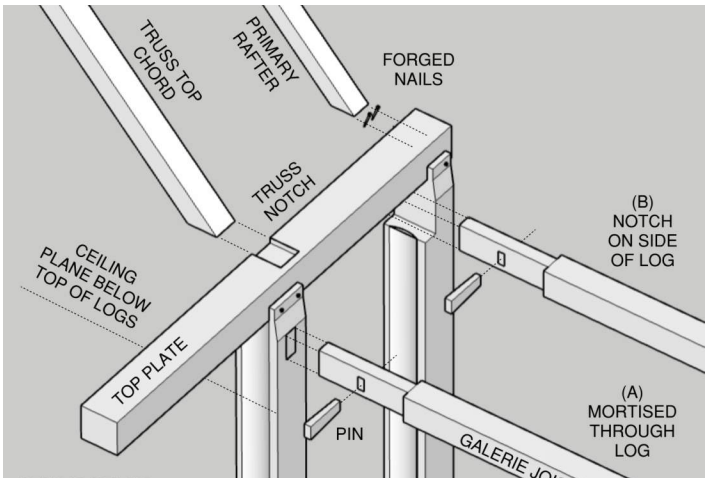



Figure GL-01. Diagram showing gallery and roof framing at the (A) Louis Bolduc House and the (B) Bequette-Ribault House. The gallery joists at the Guibourd-Vallé House connect in a similar manner to the Bolduc House.

Figure GL-02. Porch joist tenon at the Louis Bolduc House, pinned in place through a mortise in the vertical log (Source: Laura Johnson, NPS).

## PHYSICAL EVIDENCE

At the Bauvais-Amoureux House, physical evidence supporting the presence of galleries as part of the c. 1792 construction has not yet been clearly defined.

### GALLERY FRAMING

The vertical logs of the original exterior wall are completely exposed inside the enclosed north gallery, but no notches or mortise pockets in the logs are present. The beams for the existing galleries are attached to the outside face of the lower top plate member *(Figure GL-06)*. These beams appear to be hewn oak. However, both galleries were significantly reconstructed in the 1960s, and it is unclear if these beams

Figure GL-03. Gallery joist tenon at the Guibourd-Vallé House, pinned in place through a mortise in the vertical log; also note the truss top chord bears directly on the top plate in a notch. At the north and south end walls, the galleries were removed, but the abandoned mortises and notches in the top plate are still in place.

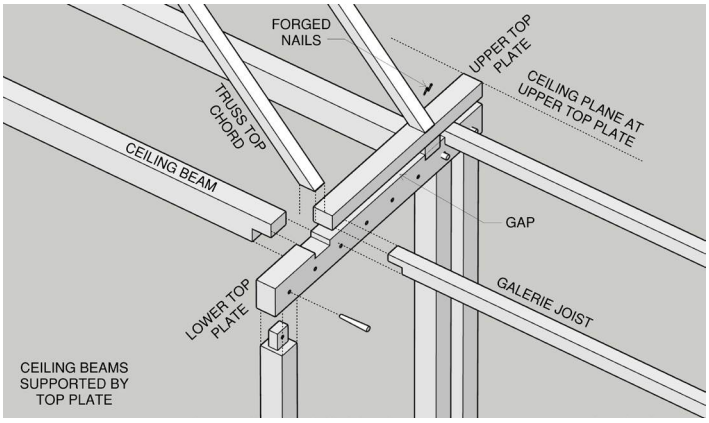



Figure GL-04. Diagram showing gallery and roof framing at the Janis-Ziegler House (Green Tree Tavern). Note that the ceiling beams and gallery joists sit between the upper and lower top plate members, creating a gap.

are original, historic alterations, or modern alterations. Further physical investigation, potentially to include the removal of ceiling and wall finishes, is needed to determine what evidence of original galleries might be concealed, particularly at the east wall, and dendrochronology is recommended for what framing members appear to be historic fabric.

## Forged Nails

The c. 1792 construction made extensive use of forged nails for the roof framing, wall framing, and ceiling boards. These nails are large diameter framing nails, approximately 3-inches long with a rectangular shaft tapered on all four sides to a point and irregular hammered heads. Forged nails would only have been used in a narrow window of time at the house due to the rising availability of cut nails after about 1800.

Curiously, multiple primary rafters have one or two forged nails on the east face of the member near the top plate, and others have nail holes or discoloration, indicating that each primary rafter originally had something attached near its bearing end *(Figure GL-07)*. These nails are not driven flush, suggesting that at one time, a smaller wood member extended from the rafters. These nails may be evidence of now missing *coyaux* or sprockets (extensions to the end of the rafters) that would have formed a projecting eave, sometimes with a slight flare (*Figure GL-05*). Coyaux would have helped protect the roofing material, whether thatch or shingle, and walls from water infiltration at the eave and were common features of French timber-framed structures. The evidence of original coyaux would support the lack of large, covered porches or galleries as part of the original construction but would not preclude the presence of smaller covered porches or enclosed *appentis* structures.

## Cut Nails

The secondary rafters appear to be attached to the primary rafters with cut nails, suggesting that the existing galleries are not original. Cut nails came into use in the early nineteenth century and remained in common use until after 1900.[72] The rafter nails could be observed in only limited areas where gaps between the framing members partially exposed the nail heads or shafts, and further investigation is necessary to confirm this condition, particularly while these areas are exposed during roofing replacement work. Further analysis of the nails is also recommended, as changes in cut nail manufacturing occurred around 1820 which may help date the construction.

## Hewn Timbers and Pole Framing

The gallery roofs are framed with pole rafters with hewn top faces to receive the spaced sheathing. The east gable wall was also framed with poles and cut nails. The use of pole framing suggests that the galleries may have been constructed before sawn lumber was an economical material in Ste. Genevieve, especially given the financial standing of the Bauvais family. Other vertical log houses in Ste. Genevieve indicate

72 Henry Mercer, "The Dating of Old Houses." *A Collection of Papers Read Before the Bucks County Historical Society*, V (1926): 536-549; and Lee Nelson, "Technical Leaflet 48: Nail Chronology as an Aid to Dating Old Buildings." United States: American Association for State and Local History, *History News*, Vol. 24, No. 11 (1968).

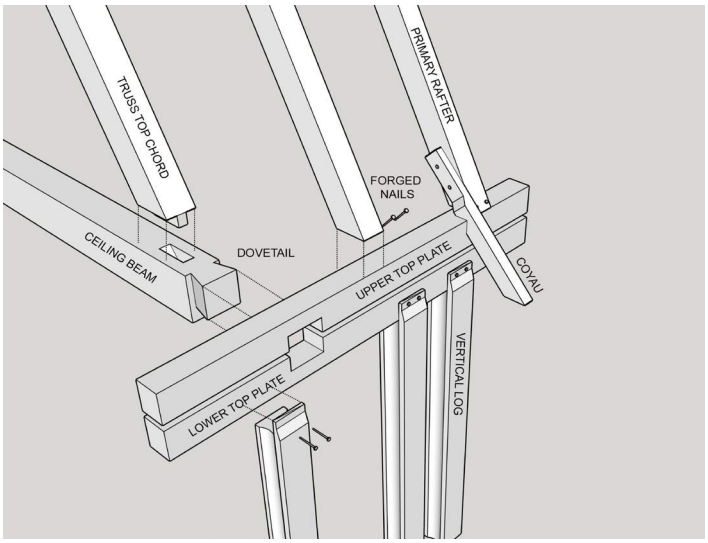



Figure GL-05. Diagram showing c. 1792 gallery and roof framing at the Bauvais-Amoureux House. Note the double top plate with a notch to receive the dovetail end of the ceiling beams which support the trusses. The rafters may have had extensions or coyaux.

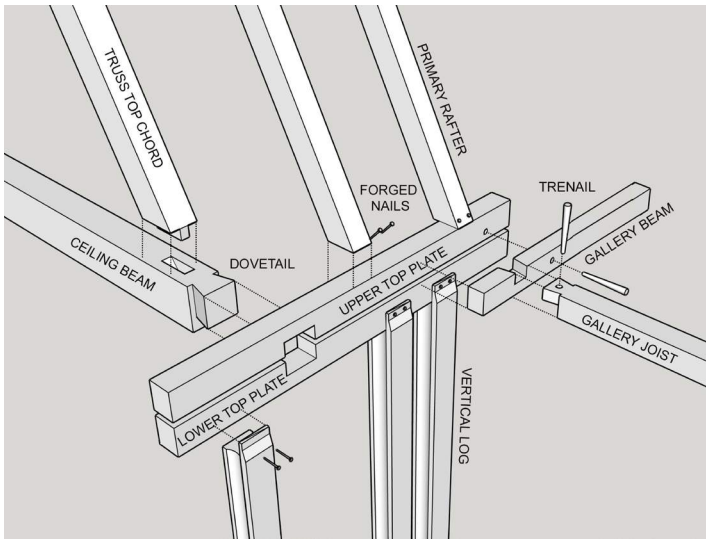



Figure GL-06. Diagram showing c. 1847 gallery and roof framing at the Bauvais-Amoureux House. The gallery roof framing is outboard of the top plate, indicating it was likely applied after the original construction.

that sawn lumber was available very early. The roof framing and ceiling beams of the Pierre Dorlac House (c. 1806) were formed entirely of vertically sawn lumber[73]; however, the dendrochronology analysis of the timbers also identified mineralization marks on the wood, possible evidence that the wood had been floated on the river to Ste. Genevieve from another location.[74]

Sawmills, both horse and water-powered, had been established regionally as early as the 1770s. Early mills appeared to not have been commercially successful, and building contracts continued to call for hand-hewn lumber.[75] Other local mills described in historical references were likely sugar or grist (flour) mills. By middle of the 19th century, widespread adoption of steam-powered sawmills increased the availability of lumber and lowered its cost significantly,[76] suggesting the existing galleries may have been constructed somewhat before that time.

Figure GL-07. Forged nails in the east face of the primary rafters that may be evidence of rafter extensions or coyaux before the galleries were constructed (circled in yellow chalk).

## Floor Framing

In addition to the top plate and roof framing conditions, the connection of the gallery floor framing to the vertical log walls can provide critical evidence of the early presence of a porch or gallery. At the north and south walls of the Bauvais-Amoureux House, no notches or pockets cut into

73 Lauer and Francis, *Vanishing French Heritage*, 150-152.

74 Richard Guyette. "Tree Ring Dating of French Colonial Vertical Log Houses in St. Genevieve, Missouri." University of Missouri – Columbia (1986 [n.d.]), 15.

75 Louis Houck. *A History of Missouri*, 371-372 and 385; Charles Peterson. *Colonial St. Louis: Building a Creole Capital*. United States: Missouri Historical Society, 1949, 26-27; and summary of research on contracts, estates, and deeds describing structures with galleries in Kaskaskia and Ste. Genevieve between 1725 – 1797, provided by Robert Mueller on June 1, 2021.

76 Charles Peterson, "Sawdust Trail, Annals of Sawmilling and the Lumber Trade from Virginia to Hawaii via Maine, Barbados, Sault Ste. Marie, Manchac and Seattle to the Year 1860." *Bulletin of the Association for Preservation Technology*, 5, No. 2 (1973), 84-153; and James Elliott Defebaugh, *History of the Lumber Industry of America*. United States: American Lumberman, 1906. Elliott provides industrial census data on mills and lumber production in the United States from 1810 through 1900. For reference, in the 1810 census, Elliott reports only nine sawmills in all of the Territory of Louisiana, but by 1850, 393 sawmills were counted in the State of Missouri alone.

the logs are present, suggesting that the gallery floors were not attached to the walls in a manner similar to that at the Bequette-Ribault House. However, the 1960s reconstruction of the galleries may have disturbed evidence of the original floor attachment. Additionally, the alteration of the east wall foundation may have removed architectural evidence of any gallery framing; further investigation under the wood siding is recommended.

### HISTORICAL DOCUMENTATION

The historical documentation reviewed to date is silent on whether the house was originally been built with or without galleries.

## Building Contracts

Numerous building contracts exist that describe vertical log houses in the Illinois Country from the mid and late-18th century. These contracts provide a wealth of detail for understanding the size, floor plans, furnishings, and the construction methodology. The contracts often reference galleries, porches, or lean-to structures (*appentis*) but in many cases are silent the particular features of the house, delineating only the overall dimensions and general framing.[77]

## Personal Accounts

In his account Recollections of Persons and Places in the West, Brackenridge described the home of Vital Bauvais in approximately 1801 as "a long, low building, with a porch or shed in front, and another in the rear."[78] Brackenridge does not further describe the porches, so their size and length are unclear. The roof framing of the Vital Bauvais House has been heavily altered by later additions to the home, but investigation of the remaining historic fabric would provide a useful counterpoint to the Bauvais-Amoureux House, as it is believed that these two houses were built at the same time and have very similar structural systems.

## Historical Imagery

An illustration of a "Maison francaise au Pays des Illinois (French house of the Illinois Country)" on Victor Collot's 1796 map of the Ohio River depicts a vertical log house galleried on all four sides, similar to the Bequette-Ribault and Louis Bolduc Houses *(Figure GL-08)*. The earliest historical photographs of vertical log structures also typically show porches or buildings with deep eave overhangs. For example, a

Figure GL-08. Victor Collot, Carte générale du cours de la rivière de l'Ohio, dated 1796. SourceL Bibliotheque nationale de France, https://gallica.bnf.fr/ark:/12148/btv1b55013299j).

Figure GL-09. Jacques Noise (Alexander McNair) House, before 1870, in St. Louis, Missouri (Source: Missouri Historical Society, https://mohistory.org/collections/item/N17103.)

c. 1865 photograph of the Jacques Noise (Alexander McNair) House in St. Louis (c. 1780, no longer extant) shows a poteaux-en-terre house with a steeply pitched hipped roof and an overhanging eave that springs from the top plate *(Figure GL-09)*; however, historical photographs of poteaux-en-terre houses without galleries also exist, such as the Bienvenue

77 Peterson, *Colonial St. Louis*, 8 and 35-37; Natalia Maree Belting, *Kaskaskia Under the French Regime*. (Urbana: Southern Illinois University Press, 1948) 33-36.

78 Brackenridge, *Recollections*, 25.

Figure GL-10. Bienvenue House, c. 1786, in St. Louis, Missouri (Source: Missouri Historical Society, https://mohistory.org/collections/item/N17097)

House (c. 1786, no longer extant) *(Figure GL-10)*.[79]

## Direct Documentation

During the lengthy probate process following Raphael St. Gemme's death in 1836, a receipt was submitted against the estate on January 14, 1847, in the amount of $13.50. The payment was marked as received by Nicolas Thomur (Thomure) and witnessed by Auguste St. Gemme (*Figure GL-11*). The receipt language indicated:

> *Received, Ste. Genevieve, January 14th. 1847, of Augustus St. Gemme Administrator of Estate of R. St. Gemme died, the sum of thirteen and 50/100 dollars for making a Gallery to said R. St. Gemme's house and for one load of posts making in all the above sum.*
> *Nicolas Thomur X his mark*
> *Witness A. St. Gemme*

While this receipt does not indicate whether the work was related to replacing an older gallery or adding an entirely new gallery to the house, the 1847 date is consistent with the construction of the existing galleries, which were certainly later additions to the c. 1792 structure. The "load of posts" may refer to the pole rafters. Nicolas Thomure was born in Kaskaskia and listed as a farmer in Ste. Genevieve in the 1850 census.

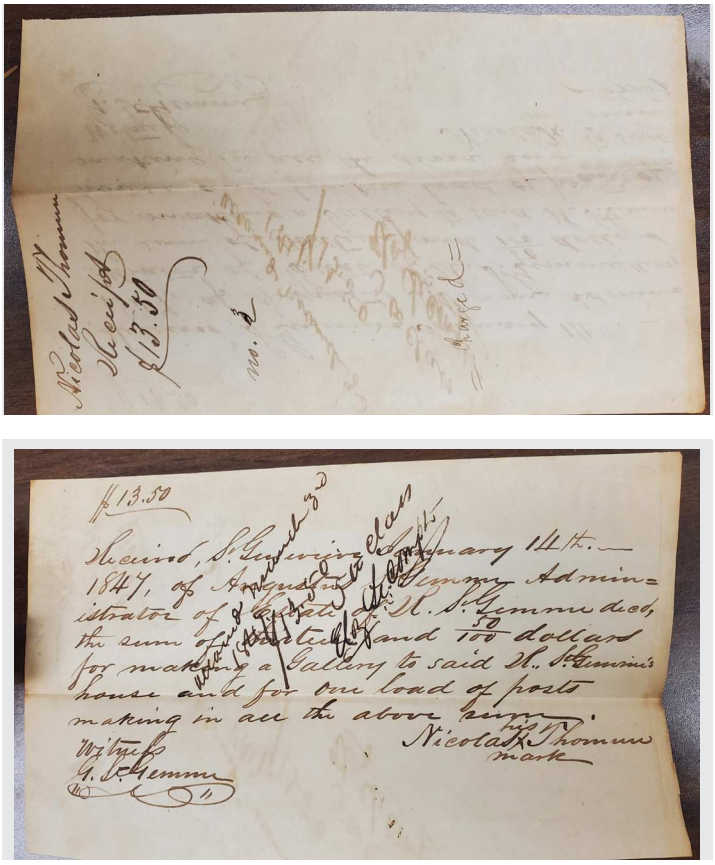


Figure GL-11. Reverse (top) and front (bottom) of the January 14, 1847 receipt to Nicolas Thomur for "making a Gallery to said R. St. Gemme's house." (Source: Raphael Bauvais estate inventory, Ste. Genevieve County Courthouse Probate and Estate Records)

## Archeological Evidence

In 1996, archeological studies were performed under both the north and south galleries in an effort to determine if there were previously smaller galleries or steps to the original doorway.[80] The excavations and wire probing documented abandoned limestone piers at the north and south, buried roughly in line with the existing gallery posts.

It was suggested that these may be foundations for early structures of sizes approximately the same as the existing galleries. No evidence that suggested smaller galleries was identified by this study. Based on the early photographs and the 1956 HABS measured drawings, both galleries have since been heavily altered, likely during the 1960s restoration when the gallery posts were replaced and relocated. The piers found by the archeological study may be those for the posts seen the early photographs which were likely in the

79 Peterson, *Colonial St. Louis*, 31, pl. 6, and pl. 7.

80 No author. “Preliminary Report on Excavations at the St. Gemme Beauvais/Amoureux House, Ste. Genevieve, Missouri.” 1996.

original post locations.

### CONCLUSIONS

While certainly not representative of every building typology in 18th century Ste. Genevieve, these sources document that porches or galleries were common to French vernacular houses of the time but were not universally present. However, it may have been unusual for the Bauvais-Amoureux House to have been originally built without galleries, especially given their presence at Vital Bauvais's house on Main Street. If small or lean-to gallery structures were originally in place, they may have left little physical evidence behind after their removal.

Historical documentation providing specific evidence for the Bauvais-Amoureux House's early appearance is limited. The only known source that makes mention of galleries is the note on Raphael's estate records. Given the probate settlement timeline and the physical evidence, an approximate date for the existing galleries is here suggested to be c. 1847. Further research and investigation, as well as additional dating through dendrochronology, may be able to narrow and refine these dates.

# To Thatch or Not to Thatch

The nature of the original roofing for the Bauvais-Amoureux House is the subject of much debate. Architectural historians who have studied the house and other vertical log structures disagree whether the c. 1792 roofing was more likely thatch or wood shingle. Very few of the vertical log houses in Ste. Genevieve have retained artifacts of their early roofing systems,[81] and no historical documentation specific to the Bauvais-Amoureux House has yet been found that describes the roofing.

In *Vanishing French Heritage*, the authors propose that the remnants of the liteaux on the primary rafters and the original steeply-pitched hipped roof of the Bauvais-Amoureux House are characteristic of thatch rather than shingles as the original roof covering.[82] Others have posited that thatch was no longer a preferred roofing material for houses of quality by the mid-18th century, and the later construction date of the

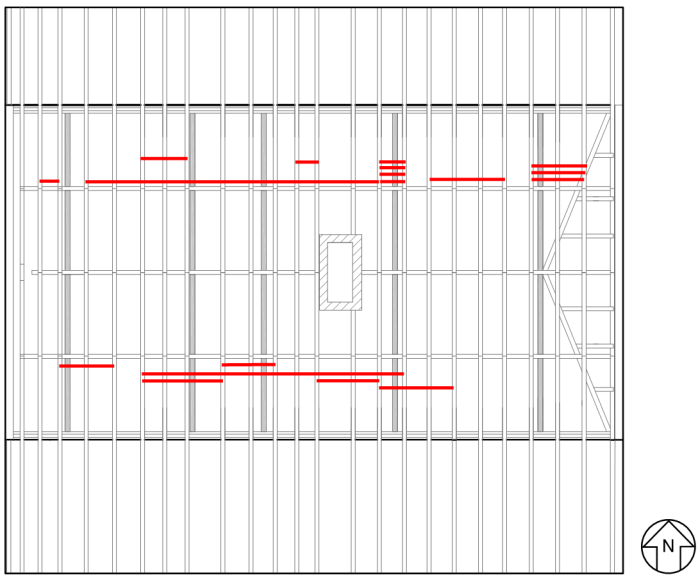



Figure TH-01. Extant liteaux in attic (indicated in red).

House supports wood shingles as the more likely original roofing. The question of whether the House originally had galleries also weighs in on this issue, as thatch would not have been a weathertight covering for a broken-pitch roof.

### HISTORICAL DOCUMENTATION

Estate inventories and deeds from late 18th century Ste. Genevieve and the surrounding communities indicate that while thatching was still in use in 1792, it was rare and more commonly applied to utility structures like sheds, barns, and stables.[83] Houses were typically described with shingled roofs when the roofing was given. This is consistent with building contracts of the time in Illinois Country, which often required shingles on buildings of better quality since at least the 1730s.[84]

### PHYSICAL EVIDENCE

Narrow wood straps or battens (liteaux) are extant in a number of places in the attic *(Figure TH-01)*. The liteaux are hand-riven, approximately 2-inches wide, spaced approximately 6-inches apart, and are attached to the outside face of the primary rafters with forged nails *(Figure TH-02)*. The liteaux are primarily still in place just under the roof line of the galleries where they are protected. In a few locations,

81 For example, at the time of writing *Vanishing French Heritage*, the authors documented remnants of the original hand-riven oak shingles in the attic of the Joseph Caron House (c. 1825) (Lauer and Francis, *Vanishing French Heritage*, 138-139.). The shingles had been protected by the roof of a later addition. Other examples likely exist and could be documented through further investigation.

82 Lauer and Francis, *Vanishing French Heritage*, 47.

83 Summary of research on estates inventories and deeds describing thatched structures in Ste. Genevieve between 1766 – 1796, provided by Robert Mueller on June 1, 2021.

84 Peterson, *Colonial St. Louis*, 20-21, 35, and 37; Fredric L. Billon, *Annals of St. Louis in Its Early Days Under the French and Spanish Dominations*. (St. Louis, MO: G. I. Jones and Company, 1886) 58; and Belting, *Kaskaskia Under French Regime*, 35-37.

Figure TH-02. Extant but loose liteaux at the north roof slope at Truss V.

Figure TH-03. Liteaux on south roof slope at Truss II, extending under the gallery rafter bearing end.

the liteaux extend under the bearing end of the gallery rafter, indicating that they were place prior to the installation of the rafters *(Figure TH-03)*. The liteaux do not have holes that would suggest any roofing was ever nailed directly to them.

No liteaux are extant above the gallery roof line; they would have been removed to accommodate the spaced sheathing boards, which were likely added when the galleries were constructed. No liteaux are extant along the lower area of the primary rafters. However, forged nails and a consistent pattern of abandoned nail holes in the rafters indicate that the liteaux were originally installed at regular spacing to the top plate *(Figure TH-04)*. Forged nails and nail holes are also present along the entire length of the hipped roof rafters, indicating that the hipped end also had liteaux. This evidence supports the theory that the original roof was sloped from the ridge to the eave without a change in pitch.

## CONCLUSIONS

The use of forged nails indicates that the liteaux were in place prior to the existing gallery framing and are likely artifacts of the c. 1792 roofing. However, the presence of the liteaux alone does not resolve the question of whether the roofing was originally thatch or wood shingle. Battens of this type were used to support numerous roofing materials; thatch could have been hung from or tied or lashed to the battens (*Figure TH-05*), while wood shakes could have been hung from the battens with wood pegs (*Figure TH-06*). Neither of these methods would leave physical marks on the liteaux.

One factor possibly in favor of thatch is that while nails were widely used in the c. 1792 construction and obviously available for securing wood shingles, the liteaux do not have nail holes. However, forged nails were labor intensive to fabricate and likely expensive; wood shingles would have required thousands of nails. A less costly roofing or attachment method might have been used.

Another factor possibly in favor of thatch are the curious anachronisms used in the construction of the Bauvais-Amoureux House.

- Why would Jean Baptiste *fils* a man of wealth and social standing, build a poteaux-en-terre house when that method was falling out of favor for the more durable poteaux-sur-sole?
- Why would his brother Vital St. Gemme Bauvais do the same, when his immediate neighbors including Jean Baptiste Vallé (c. 1794) and Louis Bolduc (c. 1793) were building more structurally sophisticated houses only a year or two later?
- Why do the two Bauvais houses not have diagonal lateral bracing, a centuries-old construction technique for heavy timber and colombage structures?

It may be that the Bauvais-Amoureux House and its near twin the Vital St. Gemme Bauvais House I were built using traditional knowledge somewhat out of date from other 1790s structures in Ste. Genevieve, including thatched roofs. Further investigation is needed, but the question of thatch or shingle may not be able to be definitively resolved.

Figure TH-04. A consistent pattern of forged nails and abandoned nail holes (marked in yellow chalk) along the hip framing and primary rafter at the northeast corner.

Figure TH-05. Underside of a thatched roof taken in 1938 near Caumont, Normandy, showing liteaux and the attachment of the thatch by lashing to the liteaux and rafters. (Source: Charles Peterson Collection, Box 2, Ste. Genevieve NHP Archives)

Figure TH-06. Underside of a modern wood shingle roof constructed using traditional carpentry practices, showing large wood shingles hung from battens with wood pegs without nails. The shingles must be heavy and properly lapped to resist wind uplift since they are not fastened to the battens. Guédelon Castle, near Treigny, France. (Source: Lurita McIntosh Blank, 2024

# Architectural Antecedents in France and French Canada

> *Creole architecture… represents an amalgam of elements drawn from widely separated cultures and synthesized into something novel, but with clear attachments to its multiple forbears. Though traces of the parental building traditions survive in the newly established forms, they are now synthesized into a unique pattern which cannot be said to represent the patrimony of any single contributing culture. They are, rather, innovations that differ in both form and in social function from their antecedents.*
>
> *Jay Edwards, "Long Distance Implantation of Vernacular Architecture Traditions: The Canadians in Early Louisiana"*[1]

The vertical log structures of Nouvelle France represent an unusual typology that evolved along nearly 300 years of French settlement and culture in North America. In the Illinois Country, building traditions from both Canada and Lower Louisiana were woven together, responding to the extremes of both cold, wet winters and hot, humid summers. These competing needs created the characteristic form of the houses in Ste. Genevieve: a house with a massive fireplace and a steeply sloped roof to shed snow, surrounded by open galleries to provide shade and ventilation. Multiple architectural historians have researched the genesis and evolution of vertical log structures in much detail, highlighting how unique these buildings are to the New World, particularly poteaux-en-terre structures, which do not appear to have a direct corollary in France.

## Pan-de-Bois

The origins of vertical log structures are found in the *pan-de-bois* structures of France (*Figure FR-01*). Pan-de-bois is a type of post and beam construction that uses heavy timbers as the load bearing structure for the walls, floors, and roof. The voids between the timbers are infilled with colombage of straw and clay, brick, tile, or stone, depending on regional practices. The colombage is not structural, but provides insulation, weatherproofing, and pest proofing. For aesthetic purposes, the timber frame is often left exposed and the colombage may be colorfully painted.

Figure FR-01. Decorative pan-de-bois facade from the mid-18th century, located in Eu, Normandy, France. (Source: Lurita McIntosh Blank, 2024)

Called "half timbering" in English and "*Fachwerk*" in German, pan-de-bois construction in Europe began in the early medieval period and continued under common use until the latter half of the 19th century, when dimension lumber and frame construction became more prevalent. Surviving examples of pan-de-bois structures in France typically date to the 15th century and later, although buildings from as early as the 13th century survive, at least in part.

## Structures in France

Pan-de-bois structures vary greatly in size, ornamentation, and sophistication of the structural system, with some buildings exhibiting multiple corbeled stories and ornate wood carving. The simplest pan-de-bois structures are single-story vernacular or agricultural buildings; these will typically be stud construction, meaning constructed with many vertical timbers, and will have steep gabled or hipped

1 Edwards, "Long Distance Implantation of Vernacular Architecture Traditions: The Canadians in Early Louisiana," *Material Culture Review / Revue de la culture matérielle* 88-89 (2018): 45-78.

roofs covered with tile, slate, or thatch. These smaller,

Similar to the houses in Ste. Genevieve, many roofs are king post trusses with an elevated collar tie member - the

Figure FR-02. 17th century barn near Livet-sur-Authou, Normandy, France showing close-stud pan-de-bois construction and a steeply-pitched thatch roof. The form is similar to how the Bauvais-Amoureux House may have originally appeared, but the construction technique is closer to poteaux-sur-sole. (Source: Lurita McIntosh Blank, 2024)

rural structures share many characteristics with vertical log houses and provide much insight into the knowledge and skill of the early settlers of the Illinois Country (*Figure FR-02*).

Straw and mud infill on lath, woven wattle, or torchis is commonly seen, as is stone or brick infill (*Figure FR-03*). Foundations are typically stone with later alterations made in brick. In parts of the country where clay or slate readily available, these will be used for roofing; in other regions, thatch is still often used, especially on agricultural buildings. Many roofs have also been replaced with 20th century materials like asphalt shingles or metal panels.

"Norman" truss (*Figure FR-04*).

## Early Structures in New France

The vertical log structures of the Illinois Country were influenced by a wide variety of sources and exhibit an amalgam of building traditions. During the 17th century, residents of Normandy, Brittany, and Poitou comprised the majority of the French who immigrated to Canada, settling particularly around Quebec. It is from these émigrés that the many of early settlers of Kaskaskia and Ste. Genevieve can trace their family lines. Other settlers arrived directly from France and the Caribbean. Additionally, there were significant cultural exchanges with settlers from other home

Figure FR-03. Torchis and bousillage infill in a pan-de-bois house Saint-Cyr-la-Campagne, Normandy, France. (Source: Lurita McIntosh Blank, 2024)

Figure FR-04. "Norman" style king post truss at an 18th century carriage house in Gouy, Normandy, France. (Source: Lurita McIntosh Blank, 2024)

countries, particularly the English, who also had a shared tradition of half-timbered construction.[2]

With the earliest structures in Quebec, the influence of building types from northern and western can be readily seen. In an early description of house construction, written in 1621 by Samuel de Champlain, a French explorer and founder of Quebec City, he describes a structure to be built in Cap -Tourmente as "made of wood and earth in the manner of those built in the villages of Normandy." Champlain spends the next several paragraphs describing the measurements, materials, and skilled labor required for the work.[3]

The house described by Champlain likely followed a building form seen throughout Normandy, with a simple, rectangular form, small windows, and a steeply pitched roof. A similar extant example is the Maison Lamontagne, built in 1744 in Rimouski, Quebec, today one of the oldest half-timbered structures in Quebec (*Figure FR-05*).[4]

Figure FR-05. Maison Lamontagne, built in 1744 in Rimouski, Quebec, one of the oldest half-timbered structures in Quebec, following pan-de-bois building tradition. (Source: Site Historique de la Maison Lamontagne, https://maisonlamontagne.com)

## Poteaux-en-Terre and Earthfast Construction

While poteaux-en-terre structures were well-known in New France starting in the 17th century, there does not appear to be a clear architectural antecedent in French vernacular construction. Charles Peterson made extensive research into the subject in the 1940s, and much of his correspondence is available in the Charles Peterson Collection in the Ste. Genevieve NHP archives. In Peterson's research, he identified a few structures in Canada that appeared to have been constructed in poteaux-en-terre (*Figure FR-06*), but his research was not able to identify any French structures or construction tradition that had a clear line of evolution into poteaux-en-terre. To date, there are no known poteaux-

2 Edwards, "Long Distance Implantation of Vernacular Architecture Traditions," 47 and 50.

3 Robitaille, Andre. *Habiter en Nouvelle-France, 1534-1648*. Quebec: Publications MNH, Inc., 1996: 230-231; and Champlain, Samuel de. *Les voyages de la Nouvelle France occidentale, dicte Canada, faits par le sr de Champlain*. Paris, France: Chez Pierre Le Mur, 1632: 113-114.

4 Site Historique de la Maison Lamontagne, https://maisonlamontagne.com/. Accessed August 12, 2024.

Figure FR-06. Poteaux-en-terre cabin in Windemere, British Columbia, built by the Hal Bavin's father and grandfather, possibly in the 1920s, photograph likley taken in the 1950s. Per the Bavin family, the ruins of the cabin may still be present at the site. (Source: Charles Peterson Collection, Box 2, Ste. Genevieve NHP Archives and email correspondence with Bavin Family)

Figure FR-07. Earthfast lodge near Allonnes, Pays de la Loire France, photographed in 1979. (Source: Ministère de la Culture regional inventory, Mérimée, Ref. No. IA00114078)

Figure FR-08. "Pony stable built by Frederick Philip Grove at Ashfield, Manitoba 1920." (Source: University of Manitoba, Archives and Special Collections, ID No. UM_pc002_A78-054_001_0003_007_0001)

en-terre structures extant in France, but wood earthfast construction was not an unknown construction method.

The use of wood earthfast construction, meaning structures formed from logs or posts set directly into the ground, dates back to pre-history and is shared in some form by nearly every culture. It is one of the simplest construction methods, and many types of earthfast structures can be readily built without access to skilled labor or sophisticated tools. As such, they are often used for temporary shelters, defensive or military construction, or agricultural use.

Wood palisade construction, called *piquette*, may have been a highly influential factor on the evolution of poteaux-en-terre construction. Palisade construction has thousands of years of use and walls made of vertical stakes can be seen in maps and illustrations of French settlements in North America, which were regularly fortified. This method could have been easily adapted into what later became called poteaux-en-terre.

Another type of earthfast construction known in France were *loges en bruyère* (heather-covered lodges) that have been used to shelter animals and protect goods since at least the 11th century (*Figure FR-07*). The lodges are simple structures and lightly framed, either pole rafters or planted post construction, and covered in thatch. As recently as the mid-20th century, lodges were still being used and maintained in the Anjou-Touraine region, along the Loire River Valley; some of these structures are still extant.[5] Similar shelters were also built by North American farmsteaders well into the 20th century (*Figure FR-08*).

5 Epaud, Frédéric. "Approche ethnoarchéologique des charpentes à poteaux plantés : les loges d'Anjou-Touraine," *Archéologie médiévale*, 39 (2009): 121-160.

# Chronology of Development and Use

Through the historical research and assisted by the physical evidence of changes over time documented during the physical investigation, a tabular chronology and graphical timeline have been prepared on the following pages to organize the major historical events, important people, and alterations that have influenced the Bauvais-Amoureux House and its site as they currently exist.

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| Jean Baptiste St. Gemme *père* (father) is born in Montreal. He marries Marie Louise Lacroix and among their children are Jean Baptiste Bauvais *fils* (son) born in 1746 in Kaskaskia. Jean Baptiste *père* died in 1773, as evidenced by his estate inventory file in the SGE-SHSMO File 117 | **1698** | |
| | **1720s** | Phillippe François Renault brought the first enslaved people from the French colony of Saint-Domingue to colonial Missouri to work as forced labor at Mine la Motte. |
| | **1750s** | Ste. Genevieve is established and noted as the oldest European settlement in Missouri. The original townsite was approximately three miles south of the current location. Significant research has been conducted on the founding date of the community, and no specific evidence exists to support a precise founding date. Ekberg's Colonial Ste. Genevieve explores the likely settlement dates and suggests it was more likely a fluid settlement from Kaskaskia to the west side of the river. The first known maps to identify Ste. Genevieve are from 1755. |
| | **1752** | First census in Ste. Genevieve identifies eight heads of household and 23 individuals. |
| | **1762** | France cedes land to Spain through the Treaty of Fontainebleau, and Spain controls the territory until 1800 when it is retroceded back to France. |
| | **1785** | A severe Mississippi River flood causes the residents of Ste. Genevieve to temporarily relocate to the hills with a later, permanent relocation to the new (current) town site. The move was gradual and by 1795 was largely complete. |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| | **1787** | The Northwest Ordinance prohibits slavery in American territory north of the Ohio River. Some French enslavers move west of the Mississippi River into Spanish controlled territory to avoid losing their enslaved people.<br><br>Eleven inhabitants are documented at the new Ste. Genevieve townsite, although this number is disputed and maybe somewhere closer to 13 or a few more residents. |
| | **1788** | Ste. Genevieve floods again. |
| Jean Baptiste *fils* arrives in Ste. Genevieve between 1789 and 1791. Baptismal records of his children indicate the move likely occurred in 1789. J. B. Bauvais III (son of Jean Baptiste *fils*) was born in Kaskaskia in 1789. The next child, Auguste Bauvais was born in 1791 in Ste. Genevieve. | **1789-1791** | |
| Jean Baptiste *fils* completes construction of his residence. The vertical red cedar log poteaux en terre construction most likely had a steeply pitched thatched roof with a rectangular floor plan. Construction date supported by dendrochronology study. | **c. 1792** | |
| Mathurin Michael Amoureux (Benjamin Amoureux's father) leaves France due to the French Revolution | **1793** | |
| Benjamin Amoureux born in Frankfort, Kentucky | **c. 1797** | |
| Jean Baptiste *fils*'s daughter Marie-Louise marries Louis Bolduc, son of Louis Bolduc *père* owner of the Bolduc House. | **1797** | |
| | **1800** | Control of the Louisiana Territory returns to France. |
| | **1803** | The United States acquires the territory as part of the Louisiana Purchase, which doubles the size of the United States. |
| | **1803-1804** | The Corps of Discovery (the Lewis and Clark Expedition) begins from St. Charles, Missouri, approximately 75 miles north of Ste. Genevieve. Lewis and Clark likely passed through Ste. Genevieve during their 1803 visit to Fort Kaskaskia. |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| | **1804** | The original five districts of Missouri are identified as Cape Girardeau, New Madrid, St. Charles, St. Louis, and Ste. Genevieve, by proclamation from William Henry Harrison, then governor of the Indiana Territory which held administrative control over the District of Louisiana. |
| Pélagie Vital born in Ste. Genevieve. Her baptismal record is available at the church archive. | **1805** | |
| Estate inventory for Jean Baptiste *fils* from January 23, 1811, describes the property to include the "the house in which he lives, with his moiety of the lot on which there are a negro cabin and several fruit trees." Moiety is defined as two parts of a lot. A lane that ran east/west in front of the House divided the House from the lot. Valued at $750. | **1811** | |
| | **1811-1812** | New Madrid Earthquakes, a series of three severe earthquakes from December through February, cause widespread, regional damage and are today recognized as some of the most intense seismic events experienced in North America since the time of European settlement. Ste. Genevieve experiences minor damage. |
| Mathurin Michael Amoureux arrives in Ste. Genevieve. | **1812** | |
| | **1814** | First American Missouri census is taken in October 1814. |
| | **1820** | The "Missouri Compromise," passed by Congress on March 3, 1820, allows Maine to enter the United States as a "free state" and Missouri to enter as a "slave state." The compromise, which maintained the balance between states where slavery was legally allowed and those states where it was prohibited, was a temporary patch on the increasingly volatile issue of slavery. |
| | **1824** | The Missouri Supreme Court ruling on Winny v. Whitesides, the first freedom suit before the court, establishes the precedent of "once free, always free." The precedent stands for nearly 20 years before being overturned. |
| Joseph Antoine Felix Amoureux, called Felix, is the first child born to Benjamin Amoureux and Pélagie on January 7. Pélagie and her son Felix were both enslaved to Félicité Janis, wife of Vital Bauvais, the brother of Jean Baptiste *fils*. | **1831** | |
| Pélagie and Felix are manumitted. | **1832** | |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| Jean Baptiste *fils* dies and the household goods including enslaved people and property are sold by order of the court. The lot and house are purchased by his son Raphael Ste. Gemme Bauvais. | **1833** | |
| | **1835** | "An act concerning free negroes and mulattoes" is passed by the State of Missouri, requiring all free people of color to apply for freedom licenses to remain in the state. The act was part of a series of efforts to reduce and control the population of free people of color in the state.<br><br>Applicants were required applicants to prove that they were born in Missouri or residents as of 1825, that they were "of good character and behavior," and capable of supporting themselves through employment. A prohibitively high fee, often in the hundreds of dollars, was also typically required. |
| Pélagie is registered in the Register of Free Negroes and Mulattoes and is described as a "33 year old mulatto woman, five feet four inches high, and a defective nose."<br><br>Auguste Ste. Gemme Bauvais, son of Jean Baptiste *fils* and brother of Raphael, purchases the House upon Raphael's death. | **1836** | |
| Auguste Ste. Gemme estate inventory from Raphael Ste. Gemme completes the probate file for "a house and lot containing six arpents more or less and being the same on which the said deceased resided at the time of his death." | **1844** | |
| Alterations to property may include addition of the galleries, reconfiguration of the roof line, and re-proportioning of the interior rooms. | **c. 1847** | |
| | **1846** | Dred and Harriet Scott, an enslaved couple in St. Louis, sue for their freedom the "once free, always free" law previously passed by Missouri Supreme Court, on the basis that their enslaver moved them to the free territory of Wisconsin before returning to Missouri. The jury finds against the Scotts on a technicality. A long series of legal proceedings would follow over the next 10 years before the case finally reached the United States Supreme Court. |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| | **1847** | Missouri General Assembly passes a law that prohibits the education of Black people, free or enslaved. It also includes a provision that prohibits free people of color from immigrating into the state. Although against the Missouri state constitution which stated that the State could not pass laws that impaired the privileges and immunities of any U.S. citizen, such laws were used to control and subjugate people of color. |
| Benjamin Amoureux purchases the residence from Auguste Ste. Gemme Bauvais. The September 12, 1852, deed record shows the purchase for $700 including the 2x3 arpents of land. | **1852** | |
| | **1854** | Kansas-Nebraska Act passes, repealing the Missouri Compromise of 1820 and allowing "popular sovereignty" in determining if a territory would be free or permit slavery. This spurs years of violence between pro- and anti-slavery forces along the Missouri-Kansas border. |
| | **1857** | U.S. Chief Justice Roger B. Taney hands down the decision in the case of Dred Scott v. Sanford. He rules against Scott, citing that Scott lacked U.S. citizenship and in Taney's opinion, enslaved people as well as free people of color, would never become U.S. citizens. As such, Scott had no standing to sue in a court of law. In his ruling, Taney further reinforced the rights of each state to determine the status of enslaved people and stated that Congress exceeded its powers in forbidding slavery in certain areas of the Louisiana Purchase, rendering the Missouri Compromise unconstitutional. |
| Benjamin Amoureux loses the House due to an unpaid debt. Fidel Hettig purchases it for payment of the promissory note on April 19, 1859. | **1859** | |
| The House is sold at Sheriff's sale for a debt of $962.72 on November 24, 1859, and is purchased by J. Felix St. James, brother of Auguste and Raphael and son of Jean Baptiste *fils*. | **1859** | |
| Pélagie and her son Felix, who were both born into slavery, file Manumission papers in Ste. Genevieve. | **1860** | |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| Felix Amoureux, identified as a free man of color, purchases the property from J. Felix St. James for $150 through a quitclaim deed on April 19, 1860. It could be assumed that St. James owned the property as a pass through ownership to clear the record of the debt and hold prior to selling outright to Felix Amoureux. The House remained occupied by the Amoureux family through this period. | **1860** | |
| Felix Amoureux sells to Jacob Stuppy through a mortgage deed on September 13, 1860, in the amount of $2,400. | **1860** | |
| | **1861** | Following the secession of South Carolina and six other states, the Missouri State Convention votes against seceding in a 98-1 vote on March 19.<br><br>The Civil War officially begins with the Battle of Fort Sumter on April 12.<br><br>By June, Union forces would occupy Jefferson City, Missouri, and the state was fully embroiled in the war. Ste. Genevieve is spared the worst of the fighting but the war is divisive among the citizens. |
| | **1861** | General John C. Frémont, commander of the United States Army Department of the West, enacts martial law in Missouri and issues a proclamation that emancipates the enslaved people of Confederate supporters in Missouri.<br><br>The Frémont Emancipation was later revoked by President Abraham Lincoln on September 11, and Frémont was removed from command. The Civil War raged within a divided state. |
| Fidel Hettig (trustee) sells lot through a default warranty deed at a courthouse sale to Jacob Stuppy for $600 on June 17, 1862 | **1862** | |
| Jacob Stuppy sells through a five year note agreement to Felix Amoureux for $2,600 on June 19, 1862. | **1862** | |
| | **1863** | President Abraham Lincoln issues the Emancipation Proclamation on January 1, proclaiming enslaved people freed in portions of seceded states not in Union control. Because Missouri did not secede, Missouri enslavers were not affected. |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| | **1865** | An ordinance that abolishes slavery in Missouri passes on January 11. Three weeks later, the U.S. Congress proposed the Thirteenth Amendment to the Constitution to abolish slavery. Missouri became the 8th state to ratify the Thirteenth Amendment to the U.S. Constitution on February 6. The amendment would finally go into effect on December 6, 1865. |
| | **1865** | Missouri adopts their second Constitution, known as the Drake Constitution, that bans enslavement without exception and includes the "Ironclad Oath" that requires teachers, clergy, judges, and others to promise they had not committed disloyal acts. |
| | **1865** | Black Missouri leaders organized the Missouri Equal Rights League in St. Louis, which was considered the state's first Black political activist organization. The League fought for legal equality, with an emphasis on education and voting. |
| Jacob Stuppy sells to Felix Amoureux for $1,400 on May 13, 1868. From 1859 when Benjamin Amoureux defaults on the property through the multiple owner transfers up to this date, the Amoureux family remained in the House whether as a renter or again as eventual owner when Felix finally secured the mortgage in 1868. | **1868** | |
| Benjamin Amoureux dies on January 21. | **1878** | |
| | **1870** | Missouri ratified the Fifteenth Amendment to the U.S. Constitution that prohibits the federal government and each state from denying a [male] citizen the right to vote based on their "race, color, or previous condition of servitude." Despite this amendment, Black citizens would face innumerable legal challenges and obstacles to excising their right to vote in the following decades. |
| | **1875** | Missouri's third Constitution is adopted, removing the Ironclad Oath and other limits placed on former Confederates and Confederate sympathizers. Racially biased institutional structures, such as legalized segregation of schools, were introduced in this Constitution, ensuring the continued repression and disenfranchisement of Black citizens. |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| | **1875** | The Civil Rights Act of 1875 was signed into law to protect the "equality of all men before the law." The Act prohibited racial discrimination in public accommodations, the right to sit on juries, and other affirmations of equality regardless race, color, or "previous condition of servitude" The Act was poorly enforced and ultimately would be ruled unconstitutional in 1883. |
| Though the dates are currently unconfirmed, a major renovation is undertaken that includes demolishing the original vertical log wall on the west end. The new west wall is constructed of sawn dimension lumber infill with brick nogging on a limestone foundation. The western most roof truss is permanently removed and the roof framing enclosed with new lumber. A new brick chimney is constructed inside of the new wall. Original vertical log wall at the east is also modified to rest on a limestone foundation. | **1880s- c. 1900** | |
| Pélagie Amoureux dies on November 11, and the House continues in Amoureux ownership under Felix Amoureux. | **1890** | |
| Felix Amoureux files his last will and testament on June 25, 1909. The will details somewhat extensive holdings including land and property as well as cash. | **1909** | |
| Felix Amoureux dies, and the estate is divided among his children. | **1910** | |
| Alfred Amoureux and wife Emma Vallee grant property to Frank Boynton Amoureux. | **1910** | |
| Felix Henry Amoureux dies. | **1914** | |
| Frank Boynton Amoureux dies. | **1923** | |
| The Bauvais-Amoureux House is purchased by William Gisi from Frank Boynton Amoureux who is unmarried at his death in 1923. This marks the end of the Amoureux tenure and stewardship of the property. | **1923** | |
| William Gisi dies in a mining accident leaving his wife Elizabeth Behr and two children. | **1924** | |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| Elizabeth Gisi receives a settlement from the accident and builds a modern residence (Craftsman style bungalow) next door to the Bauvais-Amoureux House. She marries Frank Jacobs and moves into the new house with her family. The Bauvais-Amoureux House is rented out. | **1925-1931** | |
| HABS documentation of property showing that the south porch has been partially reconstructed, the north porch is not enclosed, and remnants of the c. 1910 lattice skirting are still in place. Additionally the roof is corrugated metal. | **1936-1940** | |
| Measured drawings are prepared by HABS. | **1956** | |
| Norbert and Frances Donze purchased the House in 1963 and began to renovate and operate it as a House museum. They reconstruct the south porch. The north porch framing is also significantly reconstructed and enclosed with a frame wall and multi-lite windows. An interior partition wall dividing the east great room is removed. 19th century plaster ceilings may have been removed. They install HVAC with ductwork in the attic and ceiling vents to the first floor. The attic is insulated | **1960s** | |
| The Great Flood inundates the House. The caveau is under water, and flood damage raises concerns about structural issues with the vertical logs, floor framing, and roof trusses. Shoring is installed, a sump pump and foundation drain system installed in the cellar, ventilation introduced into the cell by opening a small area of brick infill under the porch, repairs to masonry piers and foundations walls are performed, foundation logs treated with borate rods, and plaster interior finishes are repaired and painted. A steel angle is installed along the inside face of the logs just under the flooring for stabilization. | **1993** | |
| The Friends of Vieilles Maisons Françaises purchases the House and donates it to the State of Missouri | **1994** | |

| HISTORICAL EVENT | DATE | HISTORICAL CONTEXT |
|---|---|---|
| Missouri Department of Natural Resources performs exterior restoration projects and numerous maintenance projects. These include replacing the corrugated metal roof with cedar shakes, center chimney restored to limestone, siding replaced with new cedar lap siding, HVAC system is removed and ceiling vents left in place, insulation and biological contaminants in attic abated, electrical wiring and panel are replaced, termite deterrent system (Terminix) installed, brick chimney at the west end is partially demolished. | **2004-2017** | |
| The House is donated to the NPS as part of the new Ste. Genevieve National Historical Park. | **2018** | |

# Illinois Country and Ste. Genevieve in Context

## 13,000 BP and after

People begin to occupy the Illinois County as early as 13,000 BP (Before Present) with the arrival of the first Paleoindians, who settle on the east and west banks of the Mississippi River.

By the arrival of the first Europeans, the local American Indian communities are members of the Illinois Confederation, a collection of 12 or 13 tribes.

American Indian from the Nation of Kaskaskia, from "Carte générale du cours de la rivière de l'Ohio," map by Victor Collot dated 1796 (Bibliothèque nationale de France, https://gallica.bnf.fr/ark:/12148/btv1b55013299j#)

The earliest permanent European settlements in the Illinois Country of New France are founded by French settlers.

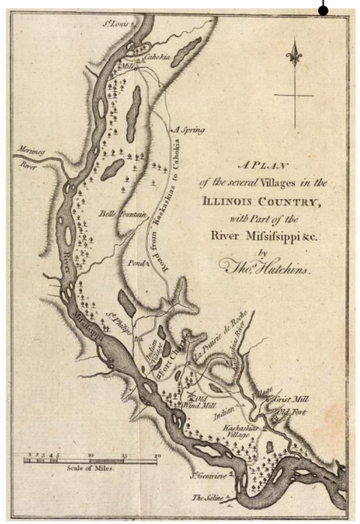
- c.1699 Cahokia
- c.1703 Kaskaskia
- c.1720 Fort de Chartres
- c.1722 Prairie du Rocher
- c.1764 St. Louis

Cahokia Courthouse, photo c. 1900 (Illinois Historic Preservation Agency) from J. Edwards , "Creole Architecture: A Comparative Analysis...," *International Journal of Historical Archaeology* 10 (3), 2006.

The French settlers bring with them building traditions from both French Canada and Lower Louisiana. A common building form in the Illinois County is the vertical log house with a broken-pitch roof and open galleries.

## 1690s

Ste. Genevieve is founded by French settlers moving from Kaskaskia, becoming the earliest permanent European settlement west of the Mississippi River.




"A Plan of the Several Villages in the Illinois Country...," map by Thomas Hutchins dated 1778 (David Rumsey Historical Map Collection, https://www.davidrumsey.com/maps5570.html).

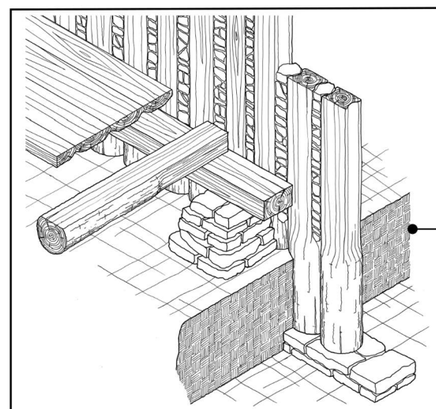
"French Habitation in the Country of the Illinois," 1826 etching after a 1796 map illustration by Georges Collot (The JCB Archive of Early American Images, https://jcb.lunaimaging.com).

## c.1740

Ste. Genevieve comes under Spanish control through the Treaty of Fountainbleau and the Treaty of Paris, which transfered the territory of Louisiana to Spain and lands east of the Mississippi River to Britain.

"An accurate map of North America. Describing and distinguishing the British, Spanish and French dominions...," map by Emanuel Bowen dated 1763 (Library of Congress, https://lccn.loc.gov/74693869)

## 1762-1763



Excerpt from the HABS drawings for the Vital St. Gemme Beauvais House, showing the poteaux-en-terre construction. This house's construction is similar to the Bauvais-Amoureux House (From Library of Congress, https://www.loc.gov/item/mo0249/).

## 1785

***L'année des grandes eaux***

After a major flood, the original site of Ste. Genevieve is abandoned, and the town is relocated to higher ground at its present location

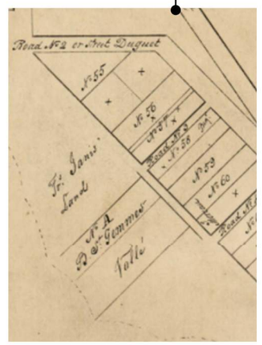
[Translation]

. . . . a house of posts in the ground thirty feet long and twenty-two feet wide, with a lean-to at one end of the said house an a double chimney of stone between the house and the lean-to; the whole to be roofed with shingles. The main posts—that is to say, those at the corners and openings in the wall—shall be of mulberry of suitable dimensions, as shall be the frames of the doors and windows in the said house. There shall be four windows so placed as to allow beds in the corners. The balance of the posts shall be of white oak, well seasoned and squared up. The said house shall be floored and ceiled with boards well planed [?] and grooved, with a partition in which shall be placed one door at the end near the main room. The main room shall be sixteen feet long with two doors cut opposite each other and two windows. There shall be two similar windows in the bedroom. The lean-to shall have one door and one window and shall be floored and ceiled with grooved boards. In addition there shall be excavated under the said house a cellar twenty feet long, fourteen feet wide and six feet deep. The said house shall be well plastered and whitewashed inside and out and the lean-to as well. The said house shall have a ceiling height of eight feet, the floor raised one foot above ground level and the lining of the cellar well made. The lumber for construction shall be subject to examination by experts. All the lumber of the said house shall be of white oak and walnut. The doors and the windows shall be well fitted with the necessary hardware. . . .[95]

Excerpt from a 1769 builder's contract to construct a poteaux-en-terre house in St. Louis, from Charles Peterson, *Colonial St. Louis: Building a Creole Capitol* (Saint Louis : Missouri Historical Society, 1949).

## c.1789

Jean Baptiste St. Gemme Bauvais, fils (son), moves his family from Kaskaskia to Ste. Genevieve and purchases land along New Bourbon Street across from the Common Field.




Excerpt from an 1825 plat map of Ste. Genevieve showing the "Beauvais St. Gemmes" land holding on New Bourbon Street.

## c.1792

Jean Baptiste, fils, constructs a poteaux-en-terre (posts in the earth) house, measuring approximately 26-feet wide by 60-feet long on the site. As originally constructed, the house likely did not have the galleries or broken-pitch roof currently present.

Although no historical documentation for Jean Baptiste, fils,'s house has been yet found, contracts exist for the building of similar structures which help understand how these buildings were constructed and their original appearance.

Model of original structure of the Bauvais House in the Ste. Genevieve welcome center.

# Changes Over Time - The Bauvais House

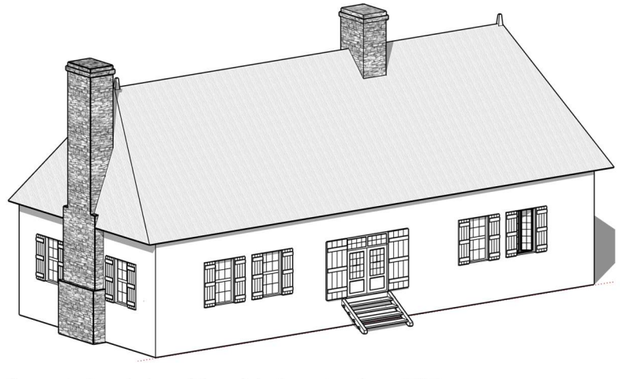
Changes to roof framing that likely date to c. 1847 to c. 1852, with the construction of the existing galleries and gable end walls (in red)

## c.1792

The original house is constructed of hewn vertical cedar logs set directly into the ground (poteaux-en-terre).

- The roof is a steeply-pitched hip and possibly thatched initially.
- The roof structure is formed with hewn white and red oak Norman (king post) trusses and rafters.
- Two stone chimneys are present, one in the center of the house that is still in place and one on the west end that has since been removed. The exterior is whitewashed per historical descriptions of the town. Windows are casements.

Few alterations to the house appear to have been made during the Bauvais Family ownership.



Conceptual rendering of the original construction c.1792

## 1800

### A Period of Swift Change for Ste. Genevieve

1800 Treaty of San Ildefonso
1803 Louisiana Purchase
1812 Territory of Missouri
1821 State of Missouri

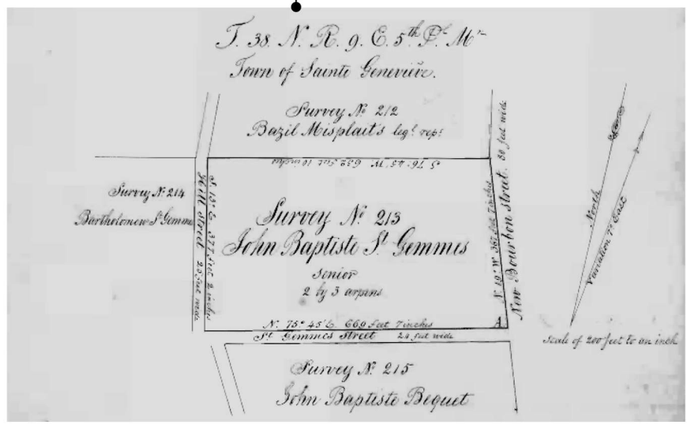
Ste. Genevieve returns to French control but shortly after is sold to the United States as part of the Louisiana Purchase and becomes the Missouri Territory, then later the State of Missouri.

"Missouri territory formerly Louisiana," map by Mathew Carey dated 1814 (Library of Congress, https://www.loc.gov/item/2001620466/).

## 1811

In the first known estate inventory in 1811, the property is described as about 6 arpents (acres) in size, with a "Negro cabin," garden, barn, and several fruit trees, valued at $700.

These features and ancillary structures are no longer standing, and no contemporary surveys survive that indicate the site features.




An 1845 property survey showing the "Jean Baptiste St. Gemmes" property along New Bourbon Street (St Genevieve County Courthouse deed records).

### New Madrid Earthquakes 1811-1812

A series of three major earthquakes from December 1811 to February 1812, considered the largest earthquakes in recorded historyeast of the Rocky Mountains. Ste. Genevieve survives with minor damage.

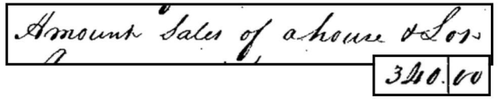
## 1833-1836

The house passes down through the Bauvais family after a series of deaths.

1833 - Jean Baptiste, fils, dies, and the House is purchased by his son Raphael Ste. Gemme.

1836 - After Raphael's death, it is purchased by his brother Auguste Ste. Gemme in 1836. At this time the house and lot are valued at $340.

1844 - An inventory on Raphael's estate describes the property as "a house and lot containing six arpents more or less and being the same on which the said deceased resided at the time of his death."

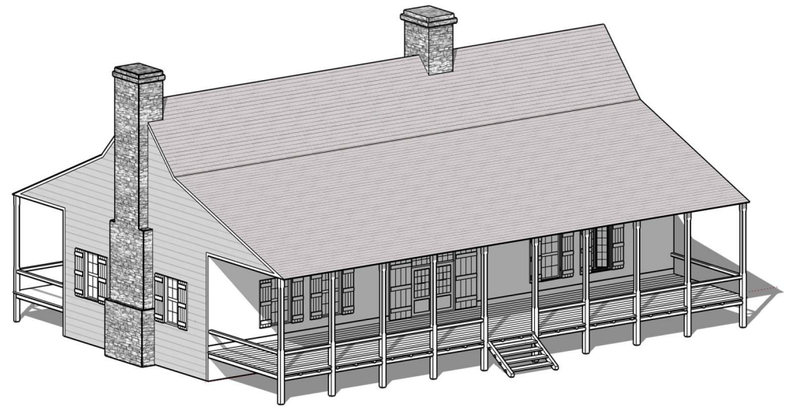



"Amount sales of a house & lot - 340.00," from the 1836 estate statement (St Genevieve County Courthouse records).

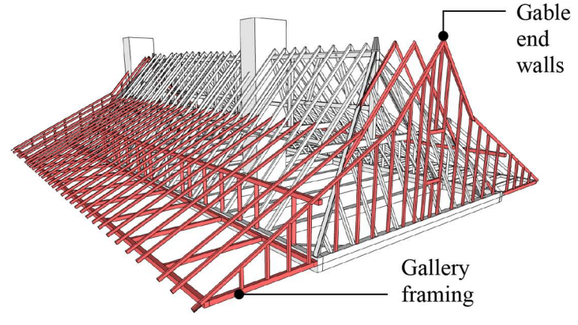
## c. 1847 - c. 1852

The first major alterations to the house occur during this era, likely after the death of Raphael in 1836.

- Galleries are constructed on the north and south walls.
- Rafters are added to create the broken-pitch gable roof.
- The rafters are partially hewn poles in a mix of local hard and softwoods.
- Gables are constructed on the east and west ends of hewn pole framing.
- The roofing is likely with wood shake. Wood weatherboard siding is added to the north, east, and west walls, and the south wall remains plastered.



Conceptual rendering of the c. 1847 alterations.



# Changes Over Time - The Amoureux House

## 1852

Benjamin C. Amoureux purchases the house and 6 acre lot and resides there with his wife Pelagie, their children, and other extended family members. The house will remain in the Amoureux family through 1923.

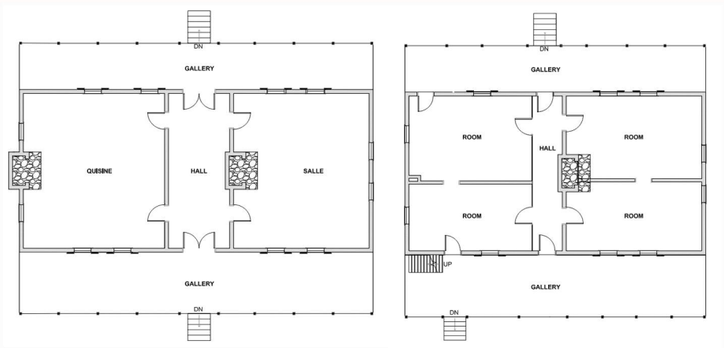
A nineteenth-century photograph believed to be members of the Amoureux family (possibly with Pelagie seated third from the right), from "Pelagie Vital" on www.familysearch.org

## 1859-1868

A second period of major alteration occurs during the Amoureux Family ownership, likley in the 1870s or 1880s.

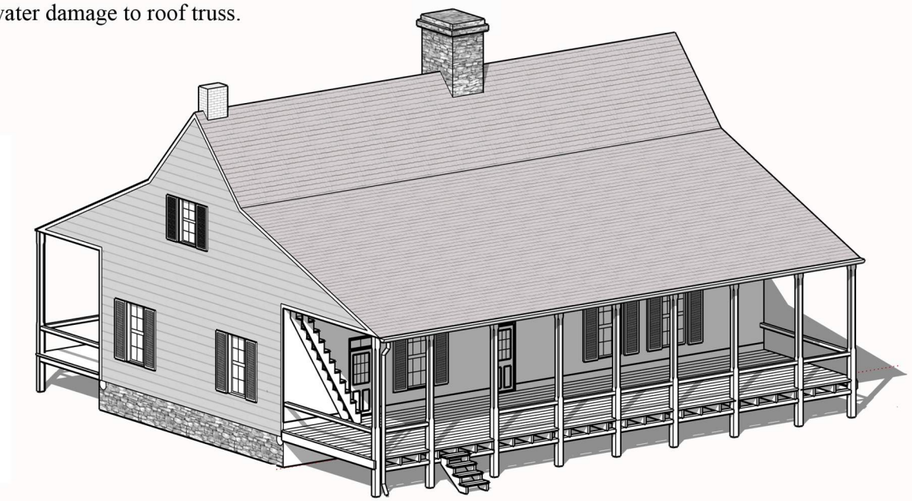
- The west log wall, the west chimney, and the first roof truss are removed, permanently shortening the structure by 8 to 12 feet.
- A new west wall is constructed from dimension lumber infilled with brick nogging on a limestone foundation.
- A new brick chimney is constructed inboard of the west frame wall.
- The east log wall is also modified to sit on a limestone foundation.
- Contemporary photos show a picket fence on a stone retaining wall along the road, and a swinging gate at the north drive; these features are no longer present.
- The existing windows are replaced with six-over-six hung window with louvered shutters.
- By 1916, the central chimney has been partially reconstructed with brick.

The reasons for these alterations are unknown but are likely be related to deterioration of the foundation logs and water damage to roof truss.




c. 1847 floor plan (left) and c. 1880 floor plan (right), showing changes to the overall house length and interior organization under the Amoureux Family ownership. Note the loss of the first truss bay on the west, which shortened the structure and the subdivision of the house into multiple rooms.

## 1870s - 1880s



Conceptual rendering of the 1870s-1880s alterations, showing removal of the western end of the house. The interior plan was also likely reconfigured at this time, along with relocation of the central door. At an undetermined date, the south gallery steps were also relocated.

## 1910

Felix Amoureux dies and the property was subdivided between his sons. This was the first major property division since the Amoureux purchase in 1852. The two photos at right may represent views of the house shortly before and after this transition in ownership.

Undated (c. 1900) photograph from the Felix Vallé House State Historic Site collection, likely the earliest known photograph of the house, showing the north wall and taken after the west end was altered.

## 1923

The house and its lot are sold to William Gisi, ending the Amoureux Family ownership.

### Early Views of the House

Undated (c.1900) photograph from Richard Deposki, *Ste. Geneviève (Images of America),* (Charleston, SC: Arcadia, 2008), showing the stone chimney still in place. Note the condition of the property compared to the 1916 photo below.

"Residence of the Ammoureaux Family" dated November 1916 (Missouri Historical Society, https://mohistory.org/collections/item/N38681). Based on this photograph, the house appears to have been recently repaired and painted white. The figures in the photo are believed to be Amoureux family members but are unidentified.

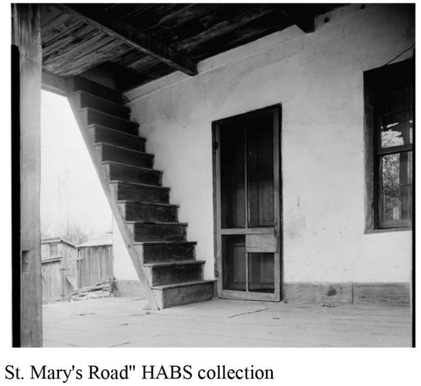
# Changes Over Time - Into the Twentieth Century

## 1936-1940

After William Gisi's death, his widow Elizabeth Gisi maintains the house as a rental property. She marries Frank Jacobs in 1925.

By the 1930s HABS photos, the house is in poor repair and may be only partially occupied.

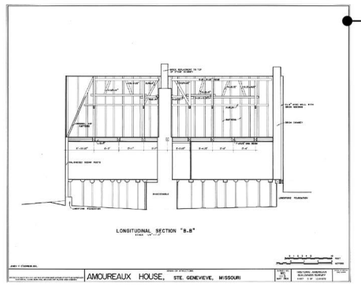
- The south galerie has been partially reconstructed. The stairs to the south galerie align with the west entry, not the center door.
- The north galerie is not enclosed. Remnants of the c. 1916 lattice skirting are still in place. The roofing is corrugated metal.
- A garden is partially visible to the west of the house.
- The stone retaining wall along St. Mary's Road is in ruins, and the picket fence along the road and swinging gates are missing.
- Wood picket and wire fences are visible along the north and south property lines.



1936 to 1940 photographs from "Amoureaux House, 327 St. Mary's Road" HABS collection (https://www.loc.gov/pictures/item/mo0247/)

## 1956

The Historic American Building Survey (HABS) produces the first measured drawings of the house, but no contemporary photographs are taken.




1956 section from "Amoureaux House, 327 St. Mary's Road" HABS collection (https://www.loc.gov/pictures/item/mo0247/)

## 1963

The house is purchased by Norbert and Frances Donze in 1963. The Donzes renovated the house and operated it as a historic house museum until 1993. During the renovations, alterations are made to the interior and exterior.

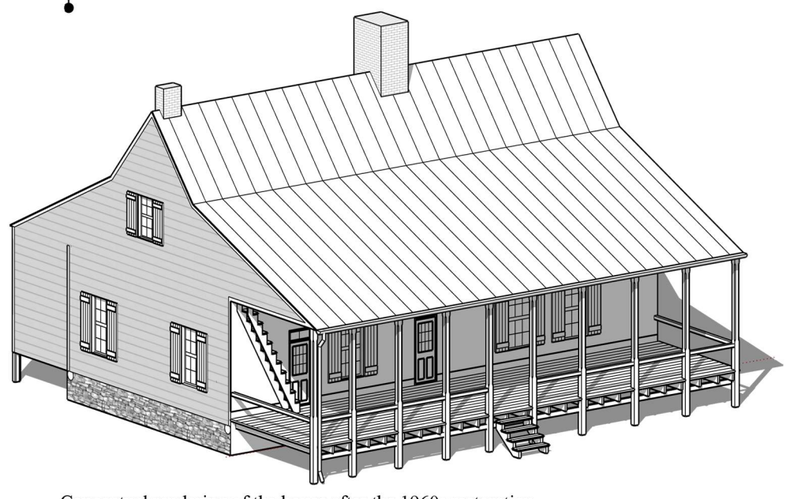
- The north and south galleries are entirely reconstructed, and the north gallery is enclosed with a frame wall and multi-lite windows.
- The south gallery stairs are relocated to their present location.
- An interior partition wall dividing the east great room is removed.
- Nineteenth-century plaster ceilings may have also been removed.
- HVAC is installed, including ductwork and insulation in the attic with ceiling vents through the first-floor ceiling.

c.1990 photography from the Donze Family collection, showing the interior of the house museum.

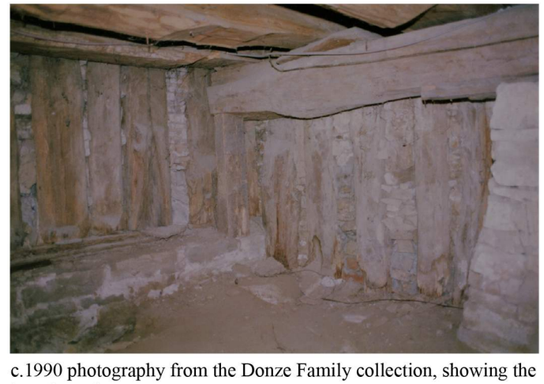
## 1970

**National Recognition 1970**

In 1960, Ste. Genevieve is recognized as a National Historic Landmark district. An amendment to the nomination in 1970 specifically identifies the Amoureux House as a contributing property.



Conceptual rendering of the house after the 1960s restoration.



c.1990 photography from the Donze Family collection, showing the logs from the caveau.

## 1993

The Great Flood of 1993 damages the house.

Shoring and foundation drainage are installed in the caveau, along with other repairs.

Flood levels at the Beauvais-Amoureux House, from Bill Nager, *Ste. Genevieve: A Leisurely Stroll Through History* (Ste. Genevieve: Merchant Street Publishing, 1998).

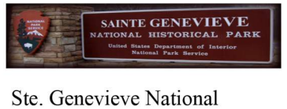
## 1994-2017

In 1994, the house is donated to the Missouri DNR who maintains the house as a visitors attraction until 2017.

Missouri DNR performs repairs and maintenance work, including replacement of the roofing and siding in 2007.

## 2018-2020

2007, shortly after roofing and siding replacement (Courtesy of Engine House No. 1).




Ste. Genevieve National Historical Park is established and the house is acquired by the National Park Service.

# Setting, Site, and Landscape Features - Then and Now

## SETTING

The Bauvais-Amoureux House is located at 327 St. Marys Road in Ste. Genevieve, Missouri. The property falls within the Ste. Genevieve Historic District, listed in the National Register of Historic Places, and designated a National Historic Landmark (c. 1960s, as expanded 1970). The district has been proposed for further expansion in a draft National Historic Landmark nomination update (2001) *(Re: Figures DH-SITE-01 and DH-SITE-02)*. The 0.12-acre property also falls within the authorized boundary of Ste. Genevieve National Historical Park *(Re: Figures DH-SITE-03 and DH-SITE-04)*.

Visitors to the Bauvais-Amoureux House arrive via St. Marys Road, a two-lane, two-way, asphalt paved public road *(Re: Figure DH-SITE-05)* The 24-foot-wide road corridor is flanked to the west by a gravel shoulder that is often used by visitors for parking *(Re: Figure DH-SITE-06)*. The road near the House is edged to the east by a 5-foot-wide strip of concrete paving. A commercial boat repair business is located along the road east of the House ("F") *(Re: Figure DH-SITE-07)*.

The house sits on an elevated terrace set a few feet above St. Marys Road. To the north of the Bauvais-Amoureux House is a residential property ("G") *(Re: DH-SITE-04)* that includes a dwelling, a gravel access drive to the south, and outbuilding to the west. The access drive closely edges the Bauvais-Amoureux House. It cuts through the steep slope that edges the terrace and is edged by steep slopes to either side as it passes

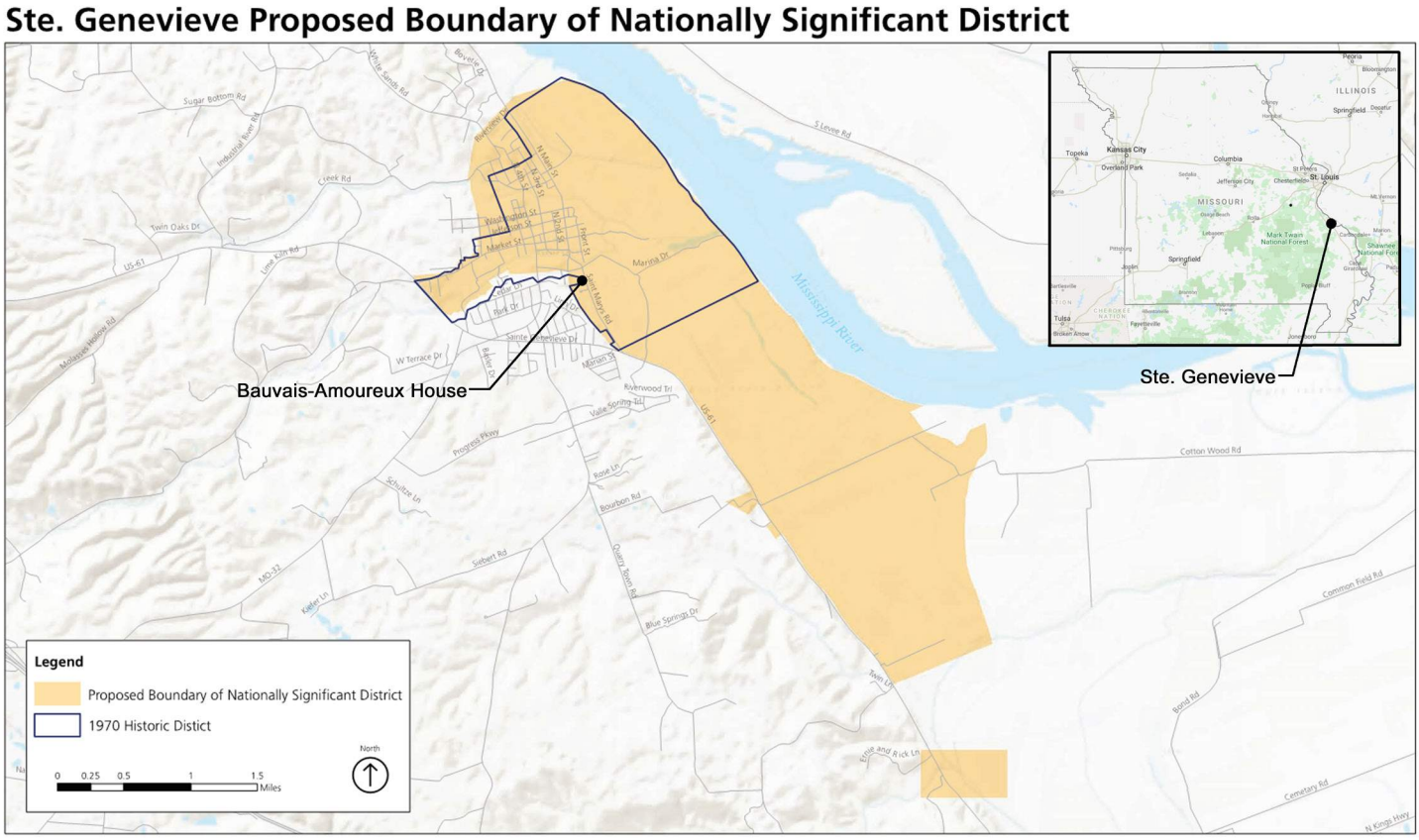



Figure DH-SITE-01. Map of the 1970 Ste. Genevieve National Historic Landmark property, and proposed expanded district based on a 2001 draft nomination update. (Source: National Park Service, Special Resource Study, 17)

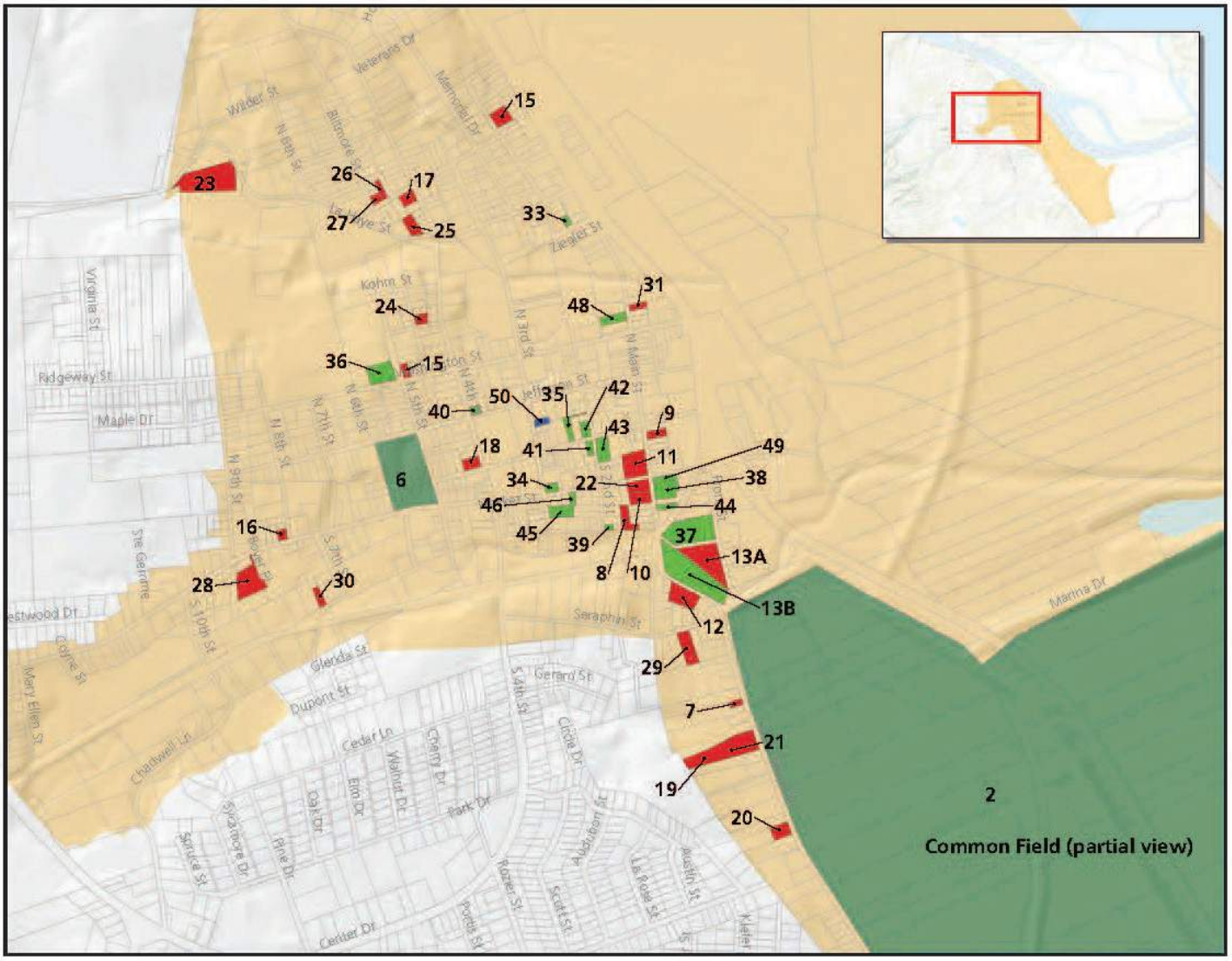



Figure 10. Ste. Genevieve and surrounding area.
(See Chapter 6: Property Inventory for a key to this map.).

Figure DH-SITE-02. Detail of the expanded National Historic Landmark district indicating contributing properties. The Bauvais-Amoureux House is #7. (Source: National Park Service, Special Resource Study, 16)

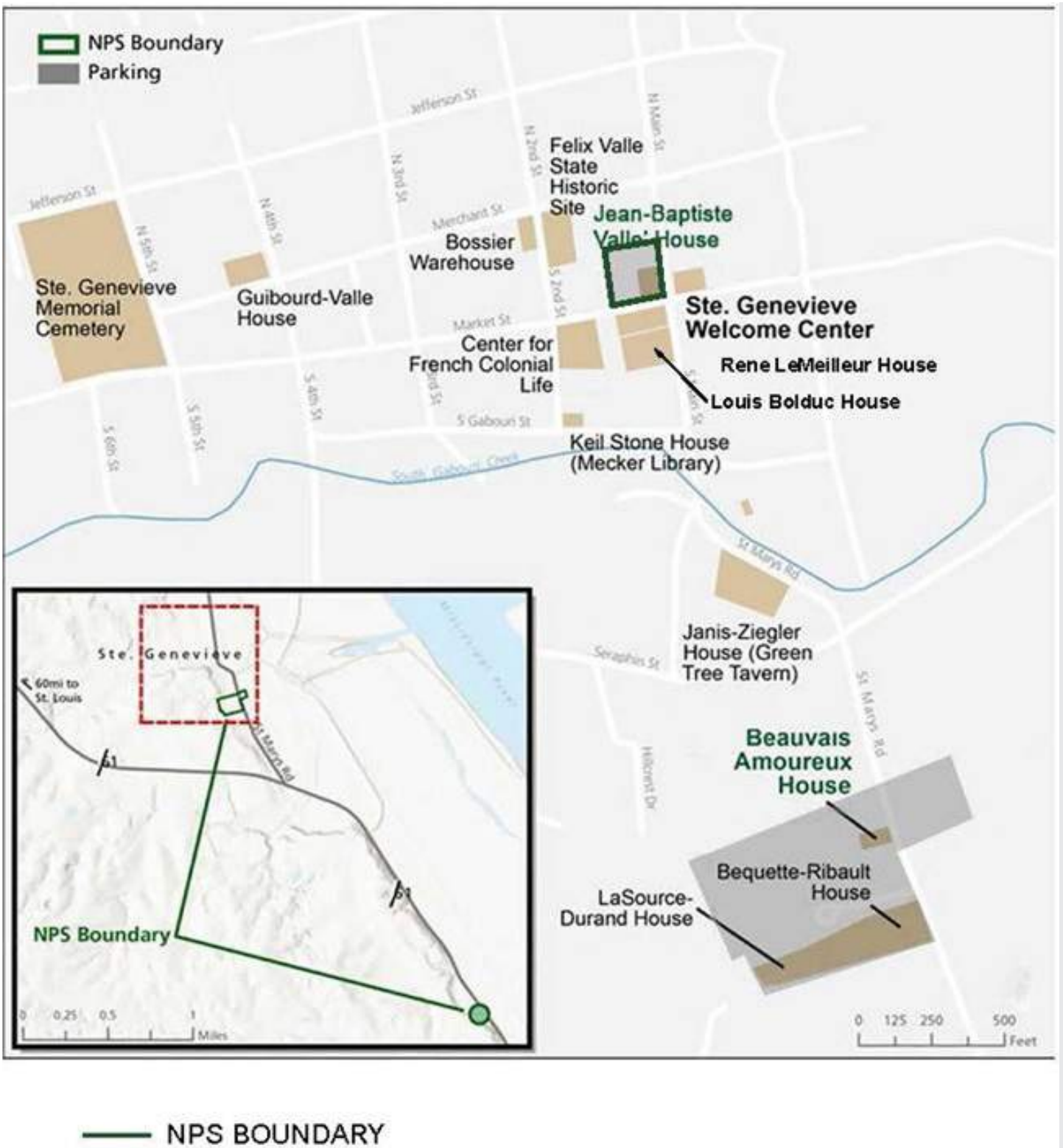



Figure DH-SITE-03. Ste. Genevieve National Historical Park park map. (Source: National Park Service, Ste. Genevieve National Historical Park website, available at https://www.nps.gov/stge/planyourvisit/maps.htm)

the Bauvais-Amoureux House to the north. The driveway and an open area adjacent to the outbuilding are used with permission by NPS to access the Bauvais-Amoureux House but is not designated for use by the public.

Another 20th-century dwelling is located to the south of the Bauvais-Amoureux House that faces St. Marys Road ("C") *(Re: DH-SITE-04)*, while a large 20th century dwelling fronted by a circular driveway is located to the southwest set back from the road ("D") *(Re: DH-SITE-04)*. The Bequette-Ribault House ("B") *(Re: DH-SITE-04)*, a c. 1808 property of French cultural influence, also falls within the park authorized boundary to the south of the Bauvais-Amoureux House along St. Marys Road. Along with the Bauvais-Amoureux House, it is one of the three surviving examples of *poteaux-en-terre* architecture within Ste. Genevieve.

The Bauvais-Amoureux House property *(Re: DH-SITE-07)* sits atop a level terrace west of St. Marys Road. A relatively steep slope forms the edge of the terrace east of the House. Access to the terrace occurs via a flight of stone steps that lead to a stone walk extending along the south façade of the House. From atop the terrace, views are afforded of the Common Field, a large open space that was established to serve community agricultural needs during the 18th century. Reference Appendix B for existing boundary and site survey.

Landscape features associated with the parcel include the terrace and slope along St. Marys Road, the stairs leading up the slope to a walkway that provides access to a cellar door in the east façade and connects to a second walkway that edges the south porch façade of the dwelling, a well or cistern, concrete foundation, concrete pad, and an identity

Figure DH-SITE-04. Authorized boundary of Ste. Genevieve National Historical Park located along St. Marys Road. The Bauvais-Amoureux House is "E". (Source: National Park Service, Special Resource Study, 40)

Figure DH-SITE-05. View south along St. Marys Road. (Source: LSHLA 2020)

Figure DH-SITE-06. View of the gravel shoulder used by visitors to park near the Bauvais-Amoureux House. (Source: LSHLA 2020)

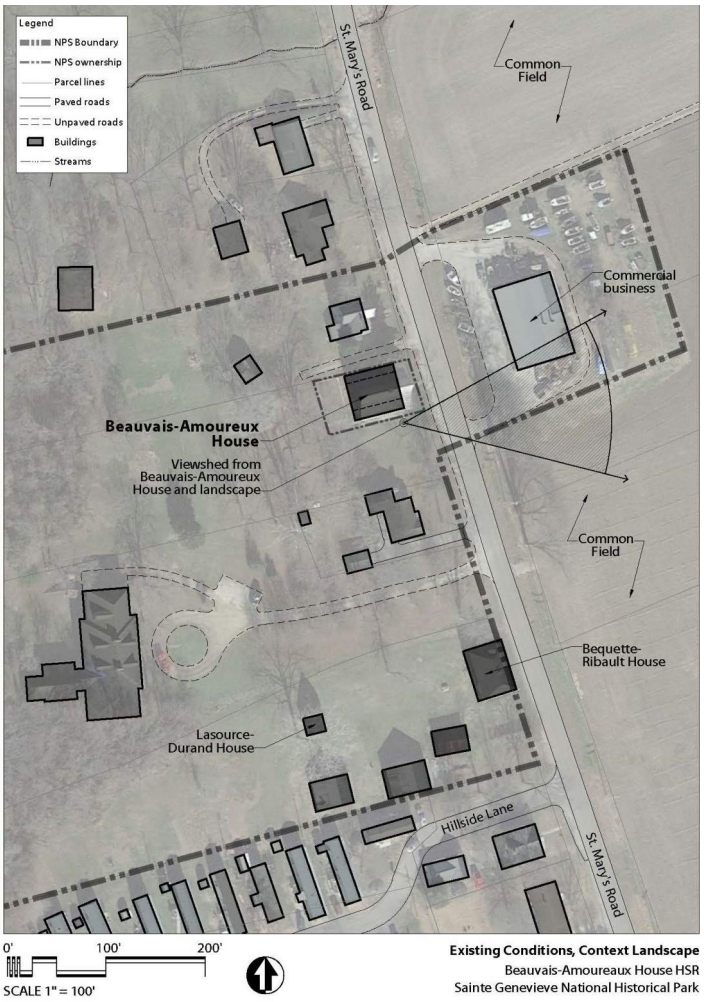



Figure DH-SITE-07. Site plan of the Bauvais-Amoureux House and environs. (Source: LSHLA, 2021, from aerial photography)

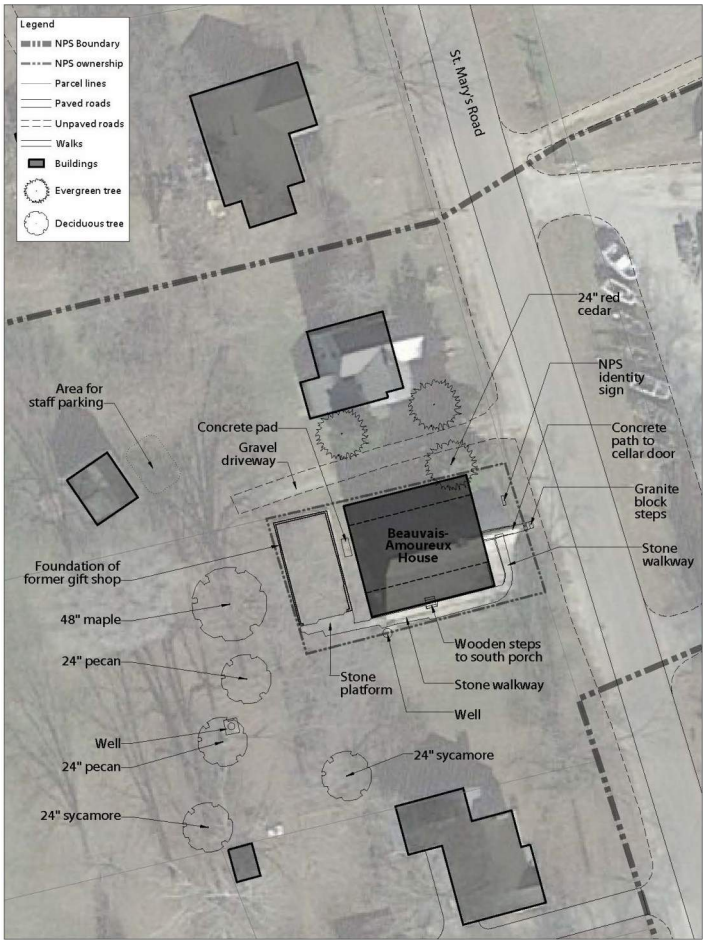



Figure DH-SITE-08. Site plan of the Bauvais-Amoureux House parcel and surrounding properties. (Source: LSHLA, 2021, from aerial photography)

Figure DH-SITE-09. Landscape west of the House. (Source: LSHLA, 2020)

Figure DH-SITE-10. Landscape east and north of the House. (Source: LSHLA, 2020)

Photographs illustrating change over time around the Bauvais-Amoureux House since c. 1900 (figures DH-SITE-11 through 31)

## VIEW SOUTHWEST TOWARD THE EAST AND NORTH FACADES OF THE BAUVAIS-AMOUREUX HOUSE

Figure DH-SITE-11. Excerpt from the c. 1900 photograph showing the parcel edged by a stone wall along St. Marys Road, wooden picket fencing, and a gate at the road leading along the north side of the House. A tree is in the yard east of the House. (Source: Richard Deposki, *Ste. Genevieve: Images of America*, p. 24)

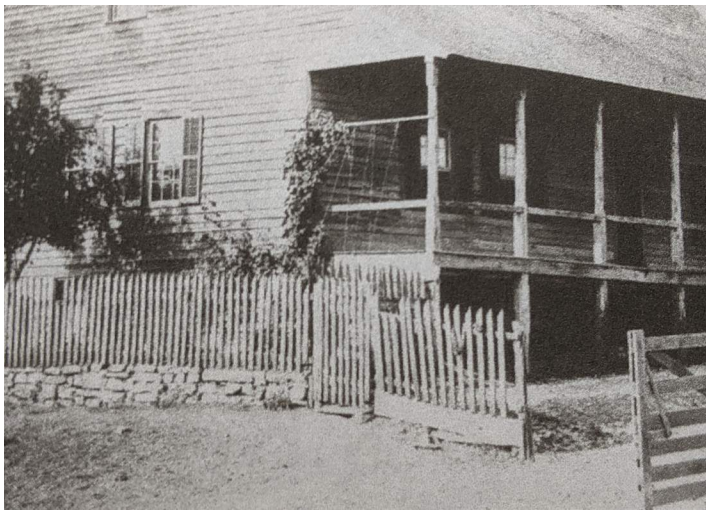


Figure DH-SITE-12. Excerpt from the c. 1916 photograph of the house from a similar angle showing the stone wall, wooden picket fence, gate at the north drive, adjacenttree, and the addition of lattice underneath the north porch. (Source: Missouri Historical Society, https://mohistory.org/collections/item/N38681)

Figure DH-SITE-13. A similar view taken during the HABS photographic documentation in 1986 showing the access road to the east, shrub and ground cover plantings, vines growing on the east façade, and signposts between the house and St. Marys Road. The north porch is enclosed.

Figure DH-SITE-14. The view, 2020, showing the access road and the maturing eastern redcedar tree north of the house. No evidence of earlier wall, fence, or gate features remain.

## VIEW WEST TOWARD THE EAST FACADE OF THE BAUVAIS-AMOUREUX HOUSE

Figure DH-SITE-15. C. 1937 photo looking west toward the east façade of the House showing the north and south porches and the slope west of the road. Electrical lines run parallel St. Marys Road.

Figure DH-SITE-16. A similar view, 2020, showing the bank cleared of vegetation and the north porch enclosed, a power line pole, and the NPS identity sign.

Figure DH-SITE-17. View toward the House from St. Marys Road c. 1990s while it was being operated as a museum and gift shop by the Donzes.

Figure DH-SITE-18. A similar view, 2020, showing the walk leading toward the east façade with a different handrail configuration, removal of shutters, changes in signage, the maturation of the cedar tree to the north, and the loss of boxwood to the south.

## VIEW NORTHWEST TOWARD THE SOUTH FACADE OF THE BAUVAIS-AMOUREUX HOUSE

Figure DH-SITE-19. C. 1937 photo of the south façade of the House showing the adjacent house, and a fence between the two. A walnut or ash tree is along the road.

Figure DH-SITE-20. Photograph of the House from the 2001 NRHP nomination showing the former road leading into the property, the boxwood plantings, stair along St. Marys Road, and view of the adjacent house to the north.

Figure DH-SITE-21. A similar view, 2020, showing that the fence, road, walnut tree, and boxwood plantings are no longer present, although the walk and handrail survive. The sloped topography has been reestablished and the driveway is no longer present.

## VIEWS NORTHWEST TOWARD THE SOUTH AND EAST FACADES OF THE BAUVAIS-AMOUREUX HOUSE

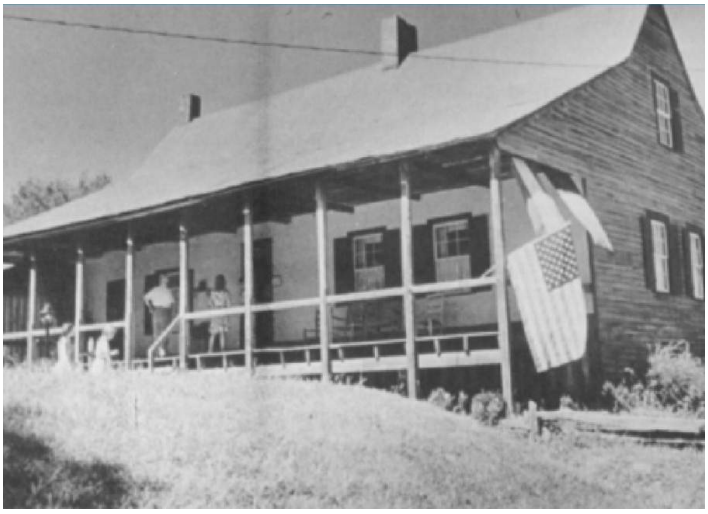


Figure DH-SITE-22. View northwest toward the Bauvais-Amoureux House c. 1970s that includes the c. 1960s-1990s gift shop to the left as well as a driveway following the south façade of the House. Wood stairs lead to the porch, while a low fence and plantings appear to edge the House to the east. The House has two chimneys.

Figure DH-SITE-23. The same view taken as part of the HABS photographic documentation in 1986 showing the south façade of the House edged by boxwood plantings. A tree appears to edge the House to the east, while a two-track driveway leads into the property from St. Marys Road. The wood stairs continue to lead to the porch. The gift shop appears west of the House. The shadow of a house on the adjacent lot to the south is visible. The House continues to feature two chimneys.

Figure DH-SITE-24. A similar view in 2020. Shown is a stone walkway edging the south side of the House. The road, boxwood plantings, gift shop, and plantings east of the House are no longer present, and the House has only one chimney. The wood stairs remain present.

## VIEW NORTH TOWARD THE SOUTH FACADE OF THE BAUVAIS-AMOUREUX HOUSE

Figure DH-SITE-25. A HABS photo from 1986 shows the south façade of the House, the driveway, wood stairs, boxwood plantings, stone walk, well, and eastern wall of the gift shop. Electrical lines edge St. Marys Road.

Figure DH-SITE-26. The Bauvais-Amoureux House looking north toward the south facade, 2020. The stone walk, wood stairs, and well remain present, while the driveway and boxwood plantings have been removed. Electrical lines continue to edge St. Marys Road.

## VIEW NORTHEAST TOWARD THE SOUTH AND WEST FACADES OF THE BAUVAIS-AMOUREUX HOUSE

Figure DH-SITE-27. A HABS photograph from 1986 shows the south and west façades of the House, driveway, wood stairs, boxwood plantings, stone walk, and well shown with a wooden bucket, with the boat repair shop in the background.

Figure DH-SITE-28. A similar view, 2020. The stone walk, wooden stair, and well remain present. The driveway and boxwood plantings have been removed.

## VIEW NORTHEAST TOWARD THE WEST AND SOUTH FACADES OF THE BAUVAIS-AMOUREUX HOUSE

Figure DH-SITE-29. A similar view c. 1940 showing the wood stairs leading to the south porch and more of the adjacent house to the north.

Figure DH-SITE-30. A similar view c. 1990s showing the adjacent gift shop built c. 1960s, the south walkway, the boxwoods, and the driveway.

Figure DH-SITE-31. View looking northeast, 2020, showing the foundation where the gift shop once stood, and the site without the boxwood plantings and driveway. Where the driveway once led to St. Marys Road, the slope has been re-graded.

sign marking the property as part of Ste. Genevieve National Historical Park that faces St. Marys Road *(Re: DH-SITE-08)*. Turf lawn and a grove of deciduous trees edge the parcel to the south and west. A gravel driveway and eastern red cedar tree edge the property to the north *(Re: DH-SITE-09 & -10)*.

# Assessment of Integrity

Assessment of integrity is based on an evaluation of the existence and condition of the physical features which date to a property's period of significance, taking into consideration the degree to which the individual qualities of integrity are present. The seven aspects of integrity as defined in the National Register Criteria for Evaluation are location, design, setting, materials, workmanship, feeling, and association. As noted in National Register Bulletin 15: *How to Apply the National Register Criteria for Evaluation*:

> Location is the place where the historic property was constructed or the place where the historic event occurred. . . . Design is the combination of elements that create the form, plan, space, structure, and style of a property. . . . Setting is the physical environment of a historic property. . . . Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property. . . . Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory. . . . Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. . . . Association is the direct link between an important historic event or person and a historic property.

National Register Bulletin 15 defines integrity as "the ability of a property to convey its significance." The essential physical features that define its character and convey its historical significance must be present for the building to be significant. These features are those that define both why a property is significant (National Register Criteria) and when it was significant (period of significance). The tangible features of both the interior and exterior must be preserved to express the building's significance.

The primary historical significance of the Bauvais-Amoureux House is for its time period of construction in c. 1792 and for its use of poteaux-en-terre construction techniques. The House is one of only three known surviving poteaux-en-terre style houses in Ste. Genevieve and one of only five known in the United States. It is also significant for its modifications in c. 1847 - c. 1852 which added north and south galleries, altering the original roof configuration, exterior material modifications, fenestration design changes, and numerous interior configuration and layout modifications. With these changes, the current building form from c. 1847 - c. 1852 time period is intact and envelopes the c. 1792 construction. Though the House has been altered, it retains integrity and is a critical contributing structure to the Ste. Genevieve National Historical Park.

The discussion below considers each of the seven aspects of integrity as they relate to the Bauvais-Amoureux House. The integrity of the House is evaluated below in terms of the most important physical aspects of the building that convey its historic character.

## Integrity of Location

The Bauvais-Amoureux House retains a high degree of integrity of location in relationship to its site. The building location has remained unchanged since its original construction in c. 1792.

## Integrity of Design

The Bauvais-Amoureux House retains a high degree of integrity of design. As mentioned previously, this building is significant for its original construction in c. 1792 and also for its significant alterations c. 1847 - c. 1852 and again during the 1890s to c. 1900. During this later time period, the western most bay of the House was removed and a new west facade was built. The appearance of the House remains consistent with its significant changes during these alterations and currently holds the same form and configuration from 1890's to c. 1900. The form, plan, space, structure and style are generally present from the period of significance.

## Integrity of Setting

The Bauvais-Amoureux House retains its integrity of setting. The integrity has been diminished due to changes in land use, but the historical significance of the House and site is retained. In its original c. 1792 construction time period, the site and surrounding area was used for a significantly different purpose and configuration than is evident today. With that said, the subsequent time periods, within the period of significance, have evolved and elements of these changes exist. One main feature contributing to the setting are the views from the Bauvais-Amoureux House toward the Common Field to the southeast, which was present by the early 19th century. This visual connection provides an important historical association for the property related to agricultural and residential land use patterns representative

of French agricultural villages during the period. The Common Field is maintained in open space and continues to be cultivated today. There are non-contributing 20th century residential houses and buildings nearby the House. There is also the contributing Bequette-Ribault House, a c. 1808 property of French cultural influence, adjacent to the Bauvais-Amoureux House as well.

### Integrity of Materials and Workmanship

The Bauvais-Amoureux House retains a high degree of integrity of materials and workmanship. The c. 1792 heavy timber trusses and the poteaux-en-terre foundation are extraordinarily intact for their age. The dominant exterior materials from the major alteration of the c. 1847 - c. 1852 time period are conveyed in the wood siding, window fenestration design, stucco surfaces, central stone chimney, and wood shingle roofing.

The interior materials from both time periods are also intact in the timber ceiling beams, wood flooring, wood ceiling boards, plaster surfaces and general plan configuration.

### Integrity of Feeling

Integrity of feeling is expressed in the aesthetic or historic sense of the period of significance. The Bauvais-Amoureux House retains a high degree of integrity of feeling. Despite changes to the site and the surroundings, the House still conveys the historic and aesthetic feeling of the period of significance.

### Integrity of Association

Association is the conveyance of the important historic activities that occurred at the site and are sufficiently intact to convey the activity. The Bauvais-Amoureux House retains a high degree of integrity of association, as a structure in continual residential use since its original construction.

# Character-Defining Features

An explanation of "character" and how to identify character defining features is described by Preservation Brief 17: Architectural Character—Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character as:

Character refers to all those visual aspects and physical features that comprise the appearance of every historic building. Character-defining elements include the overall shape of the building, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment.

Identifying character defining features assists the owner or steward of the property, researchers, design professionals, and others involved in the alteration, maintenance, and interpretation of the property to protect "those features or elements that give the building its visual character and that should be taken into account in order to preserve them to the maximum extent possible" (from Preservation Brief 17). Character defining features can be as broad as building massing or site orientation, or as specific as moulding and trim details, depending on the specific conditions of the structure being evaluated.

There are numerous important features that contribute to the historic character of the Bauvais-Amoureux House. From a site perspective, the orientation of the residence on the property and its views to the Common Field are important features, as they are from its c. 1792 time period and still maintain integrity.

The form and configuration of the current house are also some of the primary character defining features as well. The house has been changed from its original c. 1792 configuration with modifications made c. 1847 - c. 1852 that are also significant and important in its history. In c. 1852, the current interior room configuration and wall additions, exterior facade shape and materials, the north and south galleries and roof configurations are all contributing features. Both of these significant eras and changes in the house development are important in its history and tell a story as to its development and adaptation over time. The c. 1792 structural frame with the Norman trusses and the poteaux-en-terre construction methodologies are also extremely important. These elements exist today inside of the c. 1847 – c. 1852 exterior facades.

There are numerous interior materials (ceiling beams, wood ceiling boards, trim and moulding, and wood flooring) that contribute to the changes over time. Elements from multiple periods from the 18th and 19th centuries are exposed and in view within the same room, as well as later elements which can be seen with wall, door, and flooring additions. Further analysis to ascertain the dating of the elements will be needed in order to rehabilitate and preserve the house in its layout and material use that are from these main contributing time periods.

A summary of the Bauvais-Amoureux House's character defining features is as follows, developed from the guidance provided by Preservation Brief 17.

## OVERALL VISUAL ASPECT

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| **Setting and Context** | Relationship to St. Marys Road and contextual relationship with other contributing properties along St. Marys Road | *c. 1792 with later alterations*<br><br>The existing orientation of the House, with the short east wall facing St. Marys Road (formerly New Bourbon Street), maintains the same orientation as the original construction in relation to 18th-century New Bourbon Street. Other extant historic properties also contribute to the French vernacular character of the New Bourbon Street corridor, including the Janis-Zeigler House (Green-Tree Tavern), the Bequette-Ribault House, and the Pierre Dorlac House. The Bauvais-Amoureux House's contextual relationship with these properties and the road is a key character defining feature of the overall site.<br><br>Contributing features include:<br><br>• The alignment of St. Marys Road/New Bourbon Road<br>• The alignment of the House along the road trace to the south<br>• Remnants of the stone masonry retaining wall along St. Marys Road<br>• Turf lawn areas around the house |
| **Setting and Context** | Viewshed to and across the Common Field | *c. 1792 with later alterations*<br><br>The farmland to the east of St. Marys Road was historically the Grand Champ or Common Field for Ste. Genevieve. Today, this area remains cleared, agricultural land. Removal of the non-contributing property immediately across the street from the House will restore the historic character of the view both from the House and across the Common Field toward St. Marys Road.<br><br>Contributing features include:<br><br>• The House and its proximity to the Common Field to the east |

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| **Shape and Massing** | Broken-pitch, gable roof with galleries | *c. 1847 – c.1847*<br><br>The double or broken-pitch roof featuring gable ends and galleries on the long walls represents a building alteration common to French vernacular structures in Ste. Genevieve in the mid-19th century. Similar alterations at the Bequette-Ribault House and Bolduc House have been removed to restore the structures to an earlier form, but the Bauvais-Amoureux House maintains this character defining massing that documents the House's significant changes over time.<br><br>Contributing features include:<br><br>• Long, rectangular massing, with the long side forming the primary facade<br>• Broken-pitch roof form with the gable end walls<br>• Open gallery on the south wall (extant) with wood plank decking and wood plank ceilings<br>• Open gallery on the north wall (currently enclosed) with wood plank decking and wood plank ceilings Chamfered wood gallery posts<br>• Board railings at galleries<br>• South gallery stairs aligned with main entry (extant)<br>• North gallery stairs aligned with rear entry (not extant)<br>• Exterior stair to the grenier at the south gallery |
| **Openings** | Exterior windows and doors | *c. 1900, 1960s, and later alterations*<br><br>On the south wall, the majority of the existing wood windows appear to be in the original locations established during initial construction c. 1792; one window near the stairs changed location, likely with the addition of the door and alteration of the west wall in the late 19th century. The original north exterior wall is now an interior wall; the original window openings are present in the east room, but have been infilled in the west room. The windows generally align on the north-south axis, consistent with houses laid out in the en filade plan. Further investigation is needed to determine if the east wall windows are original. The west wall windows are likely in the original locations as established by the 19th century alterations to that wall.<br><br>All existing windows are 20th century replacement units that are compatible with the window style present during the later half of the period of significance. The north gallery windows date to the 1960s and post-date the period of significance. |

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| | | The central doors on the south and north walls have been altered, shifted to the east to be centered after the west end wall was altered and the house was shortened.<br><br>The c. 1792 windows were likely casements with divided lites, similar to the historic windows still in place at on the rear gallery of Guibourd-Vallé House. The c. 1792 doors may have been simple wood panel doors.<br><br>Contributing features include:<br><br>• Asymmetrical primary facade with its rhythm of window and door openings<br>• Alignment of window and door openings on the north-south axis<br>• Double-hung sash windows with 6-over-6 lites<br>• Wood batten casement shutters<br>• Wood batten-style, single-swing shutters on the attic windows<br>• Solid wood panel door on the south wall<br>• Wood panel doors with upper divided lites and transom at the main entrance on the south wall<br>• Wood batten-style doors on the basement level |
| **Construction Methodology** | Poteaux-en-terre exterior wall framing | *c. 1792*<br><br>The Bauvais-Amoureux House is one of only three extant poteaux-en-terre structures in Ste. Genevieve and one of only five in the United States. The vertical log walls set directly in the earth with their pierrotage infill are a key character defining feature, representing a rare and valuable construction methodology with national historical significance. Further, the poteaux-en-terre walls are unusual in that they do not contain the diagonal lateral bracing typical of vertical log structures. Several horizontal members are present, but additional analysis is needed to determine if these members act as lateral bracing.<br><br>Contributing features include:<br><br>• Timber vertical logs with pierrotage infill forming the wall framing that are set directly into the earth on the north and south walls<br>• Timber vertical logs with pierrotage infill forming the wall framing that bear on a limestone foundation<br>• Wood stud construction with brick infill on the west wall on a limestone foundation<br>• Timber framing for galleries |

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| **Construction Methodology** | First-floor framing | *c. 1792*<br><br>The unique framing of the first-floor structure and its independence from the exterior walls represents a key character defining feature for the building structure that is relatively rare among extant French vernacular vertical log structures, likely seen only in the Bauvais-Amoureux House and Vital St. Gemme Beauvais House.<br><br>Contributing features include:<br><br>• Puncheon floor framing members<br>• Longitudinal beams bearing on masonry piers<br>• Masonry piers that support the floor structure independent of the exterior walls |
| **Construction Methodology** | Caveau | *c. 1792 with later alterations*<br><br>The presence of a caveau or earthen cellar under an elevated first floor is a shared feature for many French vernacular vertical log structures and represents a space important to understanding the domestic needs of the early residents.<br><br>Contributing features include:<br><br>• Accessible cellar or caveau space instead of a full-height basement |
| **Construction Methodology** | Norman roof trusses | *c. 1792 with later alterations*<br><br>The modified king-post roof trusses, called Norman trusses, are characteristic of French vernacular construction in the New World. At the Bauvais-Amoureux House, the Norman roof trusses with their exposed ceiling beams are important features for the building structure and contribute to the national significance of the construction methodology. Each member of each Norman truss is inscribed with a Roman numeral, II through VI, suggesting that the trusses were fabricated and pre-assembled prior to being lifted into place. Similar marks have been found on numerous other vertical log structures in Ste. Genevieve. These marks provide important insight on the construction methodology of the House.<br><br>Contributing features include:<br><br>• Timber framing for first floor structure<br>• Norman truss roof framing with continuous longitudinal ridge truss<br>• Extant hip rafters at the east end wall<br>• Carpentry and marriage marks on the timbers |

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| **Materials** | Roofing and exterior wall covering materials | *c. 1847 – c. 1852, modern replacement materials*<br><br>Wood shingles were the roof covering for much of the House's history, since at least c. 1847 and possibly earlier, and are characteristic of the roofing treatment for French vernacular vertical log structures in Ste. Genevieve since the 18th century. Weatherboard lap siding and plaster were also common exterior wall finishes in Ste. Genevieve.<br><br>The existing cedar wood tapersawn shake roofing, cedar lap siding, and exterior lime plaster are modern replacement materials that maintain a character defining appearance aligned with the character defining massing.<br><br>Contributing features include:<br><br>• Wood shingle roofing<br>• Wood weatherboard siding on the gable end walls<br>• Extant remnants of liteaux or battens for original roofing<br>• Exposed rubble stone masonry foundation wall on the east and west walls<br>• Plaster or limewash treatment of the vertical logs on the south wall (extant) and north wall (not extant due to enclosed gallery) |
| **Projections** | Central Chimney | *c. 1792*<br><br>The central stone masonry chimney is original to the c. 1792 construction. It represents a significant feature where it projects above the roof line.<br><br>Contributing features include:<br><br>• Stone masonry chimney |

## VISUAL CHARACTER AT CLOSE RANGE

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| **Craft Details** | Four-sided dressed and puncheon (one-sided dressed) hewn structural members | *c. 1792 and c. 1847 – c. 1852*<br><br>The structural members for the original c. 1792 construction and c. 1847 – c. 1852 gallery and east gable wall alterations were fabricated by hand with an axe which created a distinctive hewn surface, in contrast to later 19th century and 20th century wood framing members which were sawn. In some locations, such as the gallery rafters, gable wall framing, and first floor joists, the puncheon members were hewn flat on the top surface only, leaving the other sides as undressed logs or poles.<br><br>These techniques provide valuable insight into the hand-crafted and labor-intensive nature of building construction in early Ste. Genevieve.<br><br>Contributing features include:<br><br>• Hewn wood surfaces visible on the vertical log wall members, gallery framing members, roof framing, and floor framing members in the basement |
| **Craft Details** | Mortise and tenon wood connections | *c. 1792*<br><br>The original c. 1792 construction of the Norman truss roof framing employed finely formed mortise and tenon connections with trenail pegs between the primary roof members. Later alterations to the House roof framing, including the gallery roofs, used nails. Similar to the hewn surface of the original members, these details provide important information in the design and construction of early wood structures in Ste. Genevieve.<br><br>Contributing features include:<br><br>• Carpentry joinery using traditional methods with wood pins (without metal fasteners), including mortise-and-tenon, half lap, scarf, and dovetail joints<br>• Marriage marks visible on the roof framing members |

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| **Craft Details** | Double top plate, truss, and ceiling beam connection | *c. 1792*<br><br>While dovetail connections were commonly used in vernacular timber architecture, the double top plate at the Bauvais-Amoureux House represents an unusual form compared to other contemporary structures in Ste. Genevieve. The phased and labor-intensive installation this detail requires provides important insight on the variety of construction methodologies available to the inhabitants of Ste. Genevieve. Further study into this detail may also be able to suggest if other building influences in addition to French vernacular styles contributed to the construction of the Bauvais-Amoureux House.<br><br>Contributing features include:<br><br>• Timber ceiling beams and top plates with dovetail connections |

## INTERIOR VISUAL CHARACTER

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| **Interior Features** | Central chimney and fireplace | *c. 1792*<br><br>The central fireplace in the *grand salle* (great room) on the east, is original to the c. 1792 construction. At this time, it is not known if the fireplace surround and stone hearth are original. The placement of the central fireplace, along with other interior finishes, plays an important role in suggesting the original floor plan of the House and the primary interior spaces.<br><br>Contributing features include:<br><br>• Stone interior firebox and hearth<br>• Wood mantle and fireplace surround (existing is compatible but likely not original) |

| ELEMENT | FEATURE OR ELEMENT | COMMENTARY |
|---|---|---|
| **Exposed Structure** | Ceiling beams and ceiling planks | *c. 1792*<br><br>Ceiling beams are located at each roof truss and at approximately midspan between trusses. At the interior, these beams are exposed to view. In the east great room, the ceiling beams have a carved beaded detail along the arises, suggesting that this room was hierarchically more prominent than the rooms on the west end. This room also features ceiling planks that were hand-planed, which suggests they were intended to be exposed and not plastered<br><br>Little information is currently known on the changes over time for the interior, and the exposed structure in the east great room is the strongest physical evidence of an original or very early interior finish.<br><br>Contributing features include:<br><br>• Exposed wood plank ceilings<br>• Exposed beaded wood ceiling beams<br>• Exposed wood ceiling beams in other rooms |
| **Interior Finishes** | Wood flooring, wood trim, wood and plaster wall surfaces | *c. 1792, 1880-1923, 1960s, 1960s-2000s*<br><br>The finishes utilized throughout the interior all contribute as the character defining features of each room. Even though most of the elements are of unknown date at this time, these materials convey the periods of time that contribute to the houses characteristic elements and should be maintained.<br><br>Contributing features include:<br><br>• Hardwood flooring (compatible but not original)<br>• Plaster wall finishes (compatible but not original)<br>• Door and window casing<br>• Baseboards and wall trim<br>• 6-panel wood panel interior woods with period hardware<br>• Wood plank partition wall |

# Physical Description

## DEFINITIONS

The following terms define subjective ratings used in this part to apply a sliding scale of condition rating, deficiency of the component and priority of the repair, as developed from Sections 7.2 and 7.4 of the "Field Operations Manual, Volume 1", United States National Park Service, Washington, D.C., 1985.

### CONDITION RATING

**Good** The element is intact, structurally sound, and performing its intended purpose. There are few or no cosmetic imperfections, and the elements need no repair and only minor or routine maintenance.

**Fair** There are early signs of wear, failure, or deterioration, though the element is generally structurally sound and performing its intended purpose. There is failure of a sub-component of the element. Up to 25 % of the element or replacement of a sub-component is required.

**Poor** The element is no longer performing its intended purpose. The element is missing. Deterioration or damage affects more than 25% of the element and cannot be adjusted or rebuilt. The element shows signs of imminent failure or breakdown. The element requires major repair or replacement.

**Failed** The element is no longer performing its intended purpose and has deteriorated to a point where it presents a life-safety hazard or is contributing to damage to other elements. Full replacement of the component may be required to restore function and service.

### REPAIR PRIORITY

**High** There is advanced deterioration which has resulted in the failure of the building element or will result in the failure of the building element if not corrected within two years; and/or there is accelerated deterioration of adjacent or related building materials as a result of the element's deficiency; and/or there is a threat to the health and/or safety of the user; and/or there is failure to meet a legislative requirement.

**Moderate** There is deterioration which, if not corrected within two to five years, will result in the failure of the building element, and/or; a threat to the health and/or safety of the user may occur within two to five years if the deterioration is not corrected, and/or; there is deterioration of adjacent or related building materials and/or systems as a result of the element's deficiency.

**Low** Standard preventative maintenance practices and building conservation methods have not been followed, and/or; there is a reduced life expectancy of affected or related building materials and/or systems, and/or; there is a condition with long-term impact beyond five years.

## CONTRIBUTING ELEMENTS

At the Bauvais-Amoureux House, both the site and the building's physical elements were evaluated for those characteristics that demonstrate the type, period, and method of construction for the House and those elements distinct to the Bauvais-Amoureux House that highlight its value as a nationally significant site.

During the field inspection, each element was noted as either Contributing or Non-Contributing to the historic character and integrity of the overall district or building as follows:

**Contributing** An element is Contributing to the historic significance of a building is one which by location, design, setting, materials, workmanship, feeling and association adds to the property's sense of time and place and historical development, and falls within the Period of Significance.

**Non-Contributing** An element Non-Contributing to the historic significance of a building is one which does not add to the property's sense of time and place and historical development; one that does not fall within the Period of Significance; or one where the location, design, setting, materials, workmanship, feeling and association have been so altered or have so deteriorated that the overall integrity of the element has been irretrievably lost

**Not Assessed** In some instances, when an element could not be properly assessed or additional research or physical investigation is needed to understand its probable construction date or integrity, the element may be indicated as Not Assessed, indicating that further research is needed to determine whether the element is contributing or non-contributing to the property

## DESCRIPTION

The Bauvais-Amoureux House is located at 327 St. Marys Road in Ste. Genevieve, Missouri. The House is recognized as one of only five extant poteaux-en-terre (meaning "post in the earth") vertical log structures in the United States; of which three are located in Ste. Genevieve. In its current form, the House is of the "Mississippi Valley French Colonial" style with modern alterations, having a broken-pitch gable roof, an open gallery (porch) on the south, an enclosed gallery on the north, a walk-out caveau (cellar), and an unfinished grenier (garret or attic) accessible from an exterior stair. The main entrance is centered on the south wall, and the east wall faces St. Marys Road (historically called New Bourbon Street). The House is currently partitioned in a center-hall plan, with a narrow central passageway flanked by rooms on the east and west. A c.1792 stone masonry chimney is located in the wall between the central hall and the great room to the east, and a partially deconstructed 1880s – c. 1900 brick masonry chimney is located on the inside of the west wall.

The exterior walls at the north, east and south are 12 inch wide vertical cedar logs with pierrotage in between. The vertical logs are placed directly into holes or a trench in the ground. The east logs no longer extend to the ground and now bear on a limestone foundation wall. This structure is covered on the majority of the building with horizontal, weatherboard siding. On the south wall, where it is protected by the porch, the structure is covered with painted stucco.

The roof is a steeply pitched gable with shed roofs protecting porches on the north and south walls. Originally thatched with local reeds, the roofing material was later changed to wood shingles, similar to those used today. Later, a metal roof was installed. This roof was replaced with cedar shingles in 2007. Originally the House had two chimneys, the west chimney being removed at an early date. Currently, the House has a central chimney straddling the ridge of the gable and roughly centered in the rectangular floor plan. An abandoned brick chimney at the west wall has been removed to the level of the attic floor. The roof has closed eaves and verges.

The main entrance door is centered on the main facade, although the placement of the door appears to have been modified from its original location. There is a secondary exterior door on this same wall and another door into the cellar at the east. The main entrance door has multi-paned glazed upper panels with two recessed panels below. This door also has a glazed transom. The secondary door on

although the placement of the door appears to have been modified from its original location. There is a secondary exterior door on this same wall and another door into the cellar at the east. The main entrance door has multi-paned glazed upper panels with two recessed panels below. This door also has a glazed transom. The secondary door on the south facade has four recessed panels. The doors have flat openings with plain wood moldings and surrounds. The windows are 6 over 6 multi-paned double hung wood frames or 12 light fixed windows set in flat openings with plain wood moldings and surrounds similar to the doors. The window sills are wood slipsills. The windows on the south facade are flanked by wood shutters. The windows, doors and frames are all painted wood.

The most dramatic alterations to the structure date to the 1880s – c. 1900 when the House was shortened and subdivided. The visible portion of the extant chimney was changed from stone to brick and a new brick chimney was built on the modified west wall. It is believed the siding, doors, windows, trim, and stucco date to this modification. Additional exterior modifications occurred c. 1963 with the reconstruction of the north and south porches, with the north porch being completely demolished and enclosed in its current configuration.

Major interior alterations occurred during the renovation in c. 1852. Plaster and wood partitions subdivided the House into four rooms with a center hall. A plaster ceiling is believed to have been installed throughout the first floor ceilings and were removed in c. 1960. Further changes to the House and grounds are noted in the assessment sections of this report.

# Condition Assessments

## ASSESSMENT METHODOLOGY

In the execution of this scope, the project team performed the following:

- Reviewed documentation on the Bauvais Amoureux House provided by NPS and from other sources, as well as available documentation on similar structures in Ste. Genevieve, Missouri; Natchitoches, Louisiana; and Pascagoula, Mississippi.
- Performed a physical investigation of the House from the interior and exterior to observe and document the conditions of the structure, architecture, finishes, building systems, and other components.
- Field verified select dimensions and measurements to confirm conditions as documented by others.
- Assessed the condition and construction methodology of the vertical log walls, first-floor framing, roof trusses, rooms and interior finishes, and site features.
- Performed limited sampling and material analysis, including wood species identification of structural members.
- Performed a level survey using a laser level on the main floor and attic floor to aid in future study of the building physiology and to serve as a benchmark for long-term monitoring for future differential settlement.
- Surveyed and sampled interior materials to identify asbestos containing materials and lead based paint locations.
- Performed a site survey to document topographical, architectural, and utility features on the site.

Further information can be found in the appendices to this report.

# Summary Condition Assessment Table

| SUMMARY OF CONDITION ASSESSMENT RATINGS & REPAIR PRIORITIES | | | | | | |
|---|---|---|---|---|---|---|
| **Category** | **Topic** | **Code** | **Subtopic** | **Assessment** | | |
| **SITE AND LANDSCAPE** | | | | | | |
| **G** | **BUILDING SITE WORK** | | | **Condition Rating** | **Deficiency Rating** | **Repair Priority** |
| **G10** | **SITE PREPARATION** | | | | | |
| | **G1022** | **SITE COMPONENTS FOR DEMOLITION** | | | | |
| | | G102201 | Abandoned Foundation | Good to Fair | Minor | Low |
| | | G102202 | Concrete Pad | Good | None | Low |
| | **G1036** | **EMBANKMENTS** | | | | |
| | | G103601 | Embankment at St. Marys Road | Poor | Serious | Moderate |
| **G20** | **SITE IMPROVEMENTS** | | | | | |
| | **G2016** | **MARKINGS AND SIGNAGE** | | | | |
| | | G201601 | Identity Sign | Good | None | Low |
| | **G2022** | **PAVING AND SURFACING** | | | | |
| | | G202201 | St. Marys Road and Parking | Good to Fair | Minor | Moderate |
| | | G202202 | North Driveway | Poor | Serious | High |
| | **G2030** | **PEDESTRIAN PAVING** | | | | |
| | | G203001 | East Walkway | Fair | Minor | Moderate |
| | | G203002 | South Walkway | Good to Fair | Minor | Moderate |
| | **G2033** | **EXTERIOR STEPS** | | | | |
| | | G203301 | East Steps to House | Good to Fair | Minor | Moderate |
| | **G2059** | **OTHER LANDSCAPE FEATURES** | | | | |
| | | G205901 | Cultural Vegetation: Trees | Good | None | Low |
| | | G205902 | View East Toward the Common Field | Fair | None | N/A |
| **G30** | **SITE MECHANICAL UTILITIES** | | | | | |
| | **G3013** | **WELL SYSTEMS** | | | | |
| | | G301301 | Well or Cistern | Good to Fair | Minor | Low |
| | | G301302 | Well or Cistern | Fair | Minor | Low |

## SUMMARY OF CONDITION ASSESSMENT RATINGS & REPAIR PRIORITIES

| Category | Topic | Code | Subtopic | Assessment | | |
|---|---|---|---|---|---|---|
| **EXTERIORS** | | | | | | |
| **B** | **SHELL** | | | **Condition Rating** | **Deficiency Rating** | **Repair Priority** |
| **B20** | **EXTERIOR ENCLOSURE** | | | | | |
| | **B2010** | **EXTERIOR WALL CONSTRUCTION** | | | | |
| | | B201001 | Weatherboard Siding | Fair | Serious | Moderate |
| | | B201002A | Exterior Plaster at South Gallery | Good | Minor | Low |
| | | B201002B | Exterior Plaster Below Gallery Decks | Failed | Serious | High |
| **B30** | **ROOFING** | | | | | |
| | **B3010** | **ROOF COVERINGS** | | | | |
| | | B301001 | Wood Shake Roofing | Poor | Critical | High |
| | **B3016** | **GUTTERS AND DOWNSPOUTS** | | | | |
| | | B301601 | Gutters and Downspouts | Poor | Critical | High |
| **INTERIORS** | | | | | | |
| **B** | **SHELL** | | | **Condition Rating** | **Deficiency Rating** | **Repair Priority** |
| **B20** | **EXTERIOR ENCLOSURE** | | | | | |
| | **B2021** | **WINDOWS** | | | | |
| | | B202101 | Windows | Fair to Poor | Serious | Moderate |
| | **B2030** | **EXTERIOR DOORS** | | | | |
| | | B203001 | Doors | Fair | Minor | Moderate |
| **C** | **INTERIORS** | | | | | |
| **C30** | **INTERIOR FINISHES** | | | | | |
| | **C3010** | **WALL FINISHES** | | | | |
| | | C301001 | Interior Walls and Trim | Good to Fair | Minor | Low |
| | | C301002 | Exposed North Log Wall | Good to Fair | Minor | Low |
| | | C301003 | Visual Evidence of Settlement Issues | Fair to Poor | Serious | High |
| | **C3020** | **FLOOR FINISHES** | | | | |
| | | C302001 | Flooring | Good | Mionr | Low |
| | **C3030** | **CEILING FINISHES** | | | | |
| | | C303001 | Beams and Ceilings | Fair | Serious | Low |
| | | C303002 | Concealed Plaster Ceiling | Fair | Minor | Low |
| **E** | **FURNISHINGS** | | | | | |
| **E20** | **FURNISHINGS** | | | | | |
| | **E2010** | **FIXED FURNISHINGS** | | | | |
| | | E201001 | Fireplace Mantel | Good | None | Low |

| SUMMARY OF CONDITION ASSESSMENT RATINGS & REPAIR PRIORITIES | | | | | | |
|---|---|---|---|---|---|---|
| **Category** | **Topic** | **Code** | **Subtopic** | **Assessment** | | |
| **EXTERIORS** | | | | | | |
| **A** | **SUBSTRUCTURE** | | | **Condition Rating** | **Deficiency Rating** | **Repair Priority** |
| **A10** | **FOUNDATIONS** | | | | | |
| | **A1020** | **SPECIAL FOUNDATIONS** | | | | |
| | | A102001 | Exterior Vertical Log Walls | Fair to Poor | Critical | High |
| **B** | **SHELL** | | | | | |
| **B10** | **SUPERSTRUCTURE** | | | | | |
| | **B1010** | **FLOOR CONSTRUCTION** | | | | |
| | | B101001 | First-Floor Framing System | Failed | Critical | High |
| | | B101002 | South Gallery | Fair | Minor | Low |
| | | B101003 | North Gallery | Good | Minor | Low |
| | **B1015** | **STAIR CONSTRUCTION** | | | | |
| | | B101501 | Grenier Stairs | Poor | Serious | High |
| | **B1020** | **ROOF CONSTRUCTION** | | | | |
| | | B102001 | Norman (King-Post) Trusses | Good to Fair | Critical | High |
| | | B102002 | Ridge Braces Trusses | Good to Failed | Critical | High |
| | | B102003 | Primary Roof Rafters | Good | Minor | Low |
| | | B102004 | Secondary (Gallery) Rafters | Good to Fair | Minor | Low |
| | | B102005 | Skip Sheathing | Good to Failed | Serious | High |
| | | B102006 | Original Roofing Battens | Good to Fair | Minor | Low |
| **B20** | **EXTERIOR ENCLOSURE** | | | | | |
| | **B2011** | **EXTERIOR WALL CONSTRUCTION** | | | | |
| | | B201101 | Exterior Wall Lateral Bracing | Good | none | Low |
| | | B201102 | Pierrotage | Good to Fair | Minor | Moderate |
| | | B201103 | East End Gable Wall | Good | None | Low |
| | | B201104 | West End Frame Wall and Gable Wall | Good | None | Low |
| **B40** | **OTHER STRUCTURES** | | | | | |
| | **B4010** | **CHIMNEYS** | | | | |
| | | B401001 | Stone Masonry Chimney | Good | Minor | Low |
| | | B401002 | Brick Masonry Chimney | Unknown | Unknown | Unknown |

| SUMMARY OF CONDITION ASSESSMENT RATINGS & REPAIR PRIORITIES | | | | | | |
|---|---|---|---|---|---|---|
| **Category** | **Topic** | **Code** | **Subtopic** | **Assessment** | | |
| **MEP-FP SYSTEMS** | | | | | | |
| **B** | **SHELL** | | | **Condition Rating** | **Deficiency Rating** | **Repair Priority** |
| **B20** | **EXTERIOR ENCLOSURE** | | | | | |
| | **B2030** | **EXTERIOR DOORS** | | | | |
| | | B203001 | Gaps at Entry Door | Fair | Minor | Moderate |
| **D** | **SERVICES** | | | | | |
| **D20** | **PLUMBING** | | | | | |
| | **D2010** | **PLUMBING FIXTURES** | | | | |
| | | D201001 | Plumbing Fixtures in House | Fair | Minor | Moderate |
| | **D2090** | **OTHER PLUMBING SYSTEMS** | | | | |
| | | D209001 | Sump Pump at House Caveau | Good | Minor | Low |
| | | D209002 | Abandoned Well and Hand Pump | Poor | Minor | Low |
| | | D209003 | Cistern | Poor | Minor | Low |
| | **D3012** | **GAS SUPPLY SYSTEM** | | | | |
| | | D301201 | Gas Utility Serving Site | Good | Minor | Moderate |
| **D30** | **HEATING, VENTILATING AND AIR CONDITIONING (HVAC)** | | | | | |
| | **D3041** | **HVAC EQUIPMENT** | | | | |
| | | D304101 | HVAC Equipment Removed | N/A | N/A | N/A |
| | | D304102 | HVAC Equipment Removed | Fair | Minor | Low |
| | | D304103 | Portable HVAC A/C Units | Good | None | N/A |

| SUMMARY OF CONDITION ASSESSMENT RATINGS & REPAIR PRIORITIES | | | | | | |
|---|---|---|---|---|---|---|
| **Category** | **Topic** | **Code** | **Subtopic** | **Assessment** | | |
| **MEP-FP SYSTEMS (CONT'D)** | | | | | | |
| **D50** | **ELECTRICAL** | | | **Condition Rating** | **Deficiency Rating** | **Repair Priority** |
| | **D5010** | **ELECTRICAL POWER DISTRIBUTION** | | | | |
| | | D501001 | Electrical Panel in House | Good | Minor | Moderate |
| | | D501002 | Circuit Directory on Panel | Good | Minor | Moderate |
| | | D501003 | Ground Rod Connection | Good | Minor | Moderate |
| | | D501004 | Branch Circuits - MC Cable, Romex, Flexible Conduit | Good | Minor | Moderate |
| | **D5020** | **POWER DISTRIBUTION AND CONTROL DEVICES** | | | | |
| | | D502001 | Receptacles and Switches | Good | Minor | Low |
| | | D502002 | Abandoned Ceiling Outlets | Fair | Minor | Low |
| | **D5022** | **LIGHTING** | | | | |
| | | D502201 | Lighting Fixture Types | Good | Minor | Low |
| | | D502202 | Exit Lighting and Emergency Lighting | N/A | N/A | High |
| | **D5030** | **COMMUNICATIONS AND SECURITY** | | | | |
| | | D503001 | Fiber Optic Service to House | Good | None | Low |
| | **D5037** | **FIRE ALARM SYSTEMS** | | | | |
| | | D503701 | Fire Alarm System | N/A | N/A | High |
| | **D5038** | **SECURITY AND DETECTION SYSTEMS** | | | | |
| | | D503801 | Intrusion Alarm Systems | N/A | N/A | High |
| | **D5090** | **LIGHTNING HAZARD REDUCTION** | | | | |
| | | D509001 | Lightning Protection System | N/A | N/A | High |

| SUMMARY OF CONDITION ASSESSMENT RATINGS & REPAIR PRIORITIES | | | | | | |
|---|---|---|---|---|---|---|
| **Category** | **Topic** | **Code** | **Subtopic** | **Assessment** | | |
| **MEP-FP SYSTEMS (CONT'D)** | | | | | | |
| **G** | **BUILDING SITE WORK** | | | **Condition Rating** | **Deficiency Rating** | **Repair Priority** |
| **G30** | **SITE MECHANICAL UTILITIES** | | | | | |
| | **G3010** | **WATER UTILITY** | | | | |
| | | G301001 | Water Service Entrance from St. Marys Rd | Good | None | N/A |
| | | G301002 | Water Service to House from Meter Pit | Good | None | N/A |
| | | G301003 | Water Service Entrance to House | Good | Serious | High |
| | | G301004 | Water Service Entrance to House | Good to Fair | Serious | High |
| | **G3020** | **SANITARY SEWER** | | | | |
| | | G302001 | Sanitary Utility Serving House | Good to Fair | Minor | Low |
| | | G302002 | Sanitary Utility Serving House | Good to Fair | Minor | Low |
| | | G302003 | Sanitary Utility Serving House | Good to Fair | Minor | Low |
| **G40** | **SITE ELECTRICAL UTILITIES** | | | | | |
| | **G4010** | **ELECTRICAL DISTRIBUTION** | | | | |
| | | G401001 | Outdoor Electrical Service to house | Good | None | Low |
| | | G401002 | Electrical Meter Socket Grounding at Pole | Good | None | Low |

| | | | |
|---|---|---|---|
| **N/A** | **GENERAL** | | |
| **N/A** | **BAUVAIS-AMOUREUX HOUSE** | | |
| | **N/A** | **N/A** | |
| | | **N/A** | N/A |
| | | **Date:** | c. 1792 / c. 1852 |
| | | **Condition:** | See Architectural Assessment. |
| | | **Contributing:** | See Architectural Assessment. |
| | | **Repair Priority:** | See Architectural Assessment. |

## DESCRIPTION

The Bauvais-Amoureux House, built c. 1792, is one of three remaining *poteaux-en-terre* (post-in-ground) houses in Ste. Genevieve, along with the Bequette-Ribault House and the Vital St. Gemme Beauvais House. Only five known examples of this type of house survive within the United States.[1] Original timber Norman trusses and two chimneys remain from the early construction. Continuous porches measuring 10 by 8 feet are on the north and south facades. The north porch was enclosed at some time after 1956. Windows are six-over six double-hung replacements for the original, which were likely casements. Walls are cedar logs sheathed in clapboard and stucco. Alterations occurred c. 1847 and c. 1852. The House was rehabilitated as a house museum c. 1963 and renovated in 2000. NPS acquired the structure in 2018. The House is listed as contributing to the Ste. Genevieve Historic District (NRIS #02000357, April 11, 2002), as well as to the Ste. Genevieve National Historic Landmark.

## COMMENTS

Refer to Context Maps and Architectural Descriptions

Figure L-01: Bauvais-Amoureux House, south façade, edged by stone walkway and turf. (Source: LSHLA, 2020)

1 National Park Service, Ste. Genevieve Final Special Resource Study and Environmental Assessment, Missouri (May 2016), 12.

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G10** | **SITE PREPARATION** | | |
| | **G1022** | **SITE COMPONENTS FOR DEMOLITION** | |
| | | **G102201** | Former Gift Shop Foundation |
| | | **Date:** | 1960s gift shop |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | Recommended for removal |

## DESCRIPTION

A concrete foundation is located 6 feet, 8 inches from the west wall of the Bauvais-Amoureux House. The foundation indicates the location of a former gift shop built in 1968 by Norbert and Frances Donze, who acquired the property in 1963. The Donzes operated the House as a historical museum open to the public until selling the property c. 1994. The gift shop continues to appear in aerial photographs until the mid-2010s.

The foundation measures 22 feet, 1 inch in width and 41 feet, 10 inches in length. At the south end, the foundation is flush with the ground. The foundation rises toward the northwest where it extends to a height of 7 1/2 inches above ground at the corner. Near the northwest corner, the foundation steps down about 1 inch, where it functions as a low retaining wall. The interior of the foundation is turf grass . The concrete foundation is in fair to good condition but exhibits cracking and chipping.

## COMMENTS

The concrete structure exhibits cracking and chipping.

Figure L-02: View southeast toward the foundation west of the Bauvais-Amoureux House. (Source: LSHLA, 2020)

Figure L-03: View south across the foundation. (Source: LSHLA, 2020)

| G | BUILDING SITE WORK | | |
|---|---|---|---|
| G30 | SITE MECHANICAL UTILITIES | | |
| | G3013 | WELL SYSTEMS | |
| | | G301301 | Well or Cistern |
| | | Date: | Undetermined, by 1940 |
| | | Condition: | Good to Fair |
| | | Contributing: | Unevaluated |
| | | Repair Priority: | Low |

## DESCRIPTION

The well or cistern is located south of the House adjacent to the south walkway. The well or cistern is marked by a circular cover composed of a granite slab that measures 3 feet, 9 inches in diameter and 6 inches in height. Short sections of wood boards are attached to the top of the well or cistern cover. The cistern reportedly collapsed and was backfilled sometime prior to NPS acquiring the property. Some settlement in the south gallery framing can likely be attributed to this collapse.

## COMMENTS

The well or cistern cover is chipped in places, and the wood boards are cupping and cracking.

↑ Figure L-04: View of the well cover adjacent to the south walkway.

↑ Figure L-05: View east of the well or cistern alongside the south walkway. (Source: LSHLA, 2020)

←Figure L-06: View of the wood boards affixed to the top of the well or cistern cover. (Source: LSHLA, 2020)

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G30** | **SITE MECHANICAL UTILITIES** | | |
| | **G3013** | **WELL SYSTEMS** | |
| | | **G301301** | Well or Cistern |
| | | **Date:** | Undetermined |
| | | **Condition:** | Fair |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The second well or cistern is located southwest of the Bauvais-Amoureux House within the turf lawn and near a large pecan tree. The well or cistern is covered by a slab of exposed aggregate concrete, rectangular in shape, that measures 5 feet, 1 inch by 5 feet, 10 inches. Set atop the concrete block is a smaller, square, exposed aggregate concrete well or cistern cap covered with several irregularly placed stone blocks of various sizes. A metal pump extends through the top of the concrete block. The well or cistern structure is in fair condition due to deterioration of the concrete.

## COMMENTS

The concrete is pitted and cracked.

↑ Figure L-07: View of the well or cistern near the Bauvais-Amoureux House. (Source: LSHLA, 2020)

↑ Figure L-08: View west of the well or cistern and the trunk of an adjacent pecan tree. (Source: LSHLA, 2020)

←Figure L-09: View east of the well or cistern and the metal pump features. (Source: LSHLA, 2020)

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G20** | **SITE IMPROVEMENTS** | | |
| | **G2033** | **EXTERIOR STEPS** | |
| | | **G203301** | East Steps to House |
| | | **Date:** | c. 1960s |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

To reach the Bauvais-Amoureux House, visitors walk up a flight of stone steps that span the slope of the terrace adjacent to St. Marys Road. The steps are constructed of mortared stone edged by a wooden handrail. The steps lead to a narrow walkway east of the House that leads to a door into the cellar. The steps consist of four treads, 3-feet wide and 15-1/2 inches deep. The risers vary in height with the lowest riser 4 inches high, and the other three 8 inches high. The adjacent wooden handrail is composed of a 1-by-4 plank, 6 feet, 8 inches long, nailed to two 2x4 posts. The steps are in fair to good condition although the granite paving is uneven in places and overgrown with grass in some places. The height of the 8-inch risers is taller than is typically considered desirable for some visitors.

## COMMENTS

The treads are uneven in places and vegetation is growing on portions of the steps.

↑ Figure L-10: View southwest of the stone steps leading from St. Marys Road to top of the terrace slope. (Source: LSHLA, 2020)

↑ Figure L-11: View west toward the steps and the walk leading to the cellar door. (Source: LSHLA, 2020)

←Figure L-12: View northwest of the steps and the handrail. (Source: LSHLA, 2020)

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G20** | **SITE IMPROVEMENTS** | | |
| | **G2030** | **PEDESTRIAN PAVING** | |
| | | **G203001** | East Walkway |
| | | **Date:** | c. 1960s |
| | | **Condition:** | Fair |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

At the top of the east steps is a narrow walkway that leads to the door into the cellar of the House. It intersects the south walkway that leads to the south porch entrance of the House. The walkway measures 3 feet in width and is surfaced with mortared stones. Granite slabs set on the end edge the walk to the north, forming a low retaining wall against the adjacent lawn. The walkway is in fair condition because the stone slabs edging the walk are leaning and unstable.

## COMMENTS

The stones are set on end to retain the slope and are leaning and unstable.

Figure L-13: View west along the east walkway toward the cellar door. (Source: LSHLA, 2020)

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G20** | **SITE IMPROVEMENTS** | | |
| | **G2030** | **PEDESTRIAN PAVING** | |
| | | **G203002** | South Walkway |
| | | **Date:** | Undetermined, two periods of construction represented |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

The front walk arises from the east walkway leading toward the cellar door. A single stone step marks the transition to the south walkway. The walkway continues around the southeastern corner of the House and then parallels the south porch.

The section of the south walkway that parallels the eastern façade of the House measures 3 feet, 3 inches in width and is edged by granite block curb stones. The stone pieces range from 14 to 25 inches in length and are 4 inches wide and 2 1/2 inches in height.

South of the House the walkway is composed of a northern and southern section. The older section to the south is constructed of granite stones used as pavers closely set with fine grained mortar joints. The newer section to the north is paved with larger stones set with relatively wide aggregate cement mix mortar joints of a contrasting color. The original walk measures 3 feet, 3 inches in width, as does the additional section. The walk leads to a flight of wood stairs that provide access to the front porch and main entrance to the House. The wood stairs include five treads that measure 4 feet in width, 12 inches in depth, and rise 6 inches in height. Wooden handrails mounted on wooden posts edge the stair to either side.

West of the front stairs the walkway narrows to 5 feet, 2 inches in width. The paving stones of this section match the newer construction in terms of materials and paving pattern. The front walk ends at the southwest corner of the House near an irregularly shaped concrete platform associated with the foundation of the former gift shop. The front walk is in fair condition due to evidence of cracked and missing mortar. The surface of the walk is uneven. The newer section includes joints in poor condition that expose stone edges that may become tripping hazards.The eastern segment of the walkway is 3 feet, 3 inches wide and edged with granite block curb stones. Curb stone pieces range from 14 inches to 25 inches in length, are 4 inches wide and 2.5 inches in height. An addition to the older section of the walkway expanded the width to 6 feet, 6 inches and encompassed the south porch support posts. Walkway ends west of the House and foundation.

## COMMENTS

Walkway exhibits cracks and missing mortar joints. Surface is uneven and new joints expose stone edges that may be tripping hazards. Some stones cracked.

Figure L-14: View south along the south walkway as it leads around the corner of the House. (Source: LSHLA, 2020)

Figure L-15: View north of the south walkway and the two sections. (Source: LSHLA, 2020)

Figure L-16: View north of the south walkway and the wood stairs leading to the porch. (Source: LSHLA, 2020)

| G | BUILDING SITE WORK | | |
|---|---|---|---|
| G20 | SITE IMPROVEMENTS | | |
| | G2022 | PAVING AND SURFACING | |
| | | G202201 | St. Marys Road and Parking |
| | | Date: | Late 1790s |
| | | Condition: | Good to Fair |
| | | Contributing: | Contributing (corridor alignment) |
| | | Repair Priority: | Moderate |

## DESCRIPTION

The house is located at 327 St. Marys Road (formerly New Bourbon Street). Visitor access to the house is from St. Marys Road heading north or south. The 24-foot-wide asphalt roadway is flanked on the west side by a gravel shoulder used for parking. Visitors must park on the road shoulder and walk up the slope in order to reach the House.

## COMMENTS

Shoulder is gravel and narrow and does not provide sufficient parking capacity or an accessible path to the house.

Figure L-17: View looking south along St. Marys Road with the Bauvais-Amoureux house to the west (right). (Source: LSHLA, 2020)

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G20** | **SITE IMPROVEMENTS** | | |
| | **G2022** | **PAVING AND SURFACING** | |
| | | **G202202** | North Driveway |
| | | **Date:** | Early 1900s |
| | | **Condition:** | Poor |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | High |

## DESCRIPTION

A gravel driveway leads west from St. Marys Road along the north façade of the House. The driveway cuts through the steep slope the edges St. Marys Road to the terrace, and is edged to either side by steep slopes near its intersection with the road. The driveway ends in a small parking area used by NPS with permission. It is not designated for use by visitors. Ruins of a stone wall are present near the east end of the driveway.

## COMMENTS

The gravel is poorly leveled and washed away in some locations. The driveway is deeply rutted by vehicle wheels.

Figure L-18: The driveway north of the House cuts through the slopes that edge St. Marys Road to the west. Park staff use the driveway to access an informal parking area near the small shed in the distance. (Source: LSHLA, 2020)

| G | BUILDING SITE WORK | | |
|---|---|---|---|
| G10 | SITE PREPARATION | | |
| | G1036 | EMBANKMENTS | |
| | | G103601 | Embankment at St. Marys Road |
| | | Date: | Late 1930s |
| | | Condition: | Poor |
| | | Contributing: | Unevaluated |
| | | Repair Priority: | Moderate |

## DESCRIPTION

The slope that edges St. Marys Road to the west is steep enough that steps are needed to access the terrace on which the houses are sited. Historic photographs indicate that a stone retaining wall edged the property in this location during the early 20th century. No evidence of the wall appears to survive today.

## COMMENTS

The slope is steep and may be subject to erosion issues. It also presents limitations related to accessibility to the House.

Figure L-19: View of the slope that edges St. Marys Road to the west. (Source: LSHLA, 2020)

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G20** | **SITE IMPROVEMENTS** | | |
| | **G2059** | **OTHER LANDSCAPE FEATURES** | |
| | | **G205901** | Cultural Vegetation; Trees |
| | | **Date:** | Undetermined, eastern red cedar tree appears in photographs dating to the early- to mid-20th century |
| | | **Condition:** | Good |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | Low |

## DESCRIPTION

There are no trees located within the Bauvais-Amoureux House parcel. Located nearby to the southwest is a grove of deciduous shade trees that include sugar maple, pecan, and sycamore trees. North of the House is a single eastern redcedar tree.

The sugar maple (Acer saccharum) tree measures 48 inches in caliper and is located approximately 52 feet west of the Bauvais-Amoureux House. This is the largest tree within the vicinity of the House.

Nearby are three pecan (Carya Illinoinensis) trees that measure 24 inches in caliper and two sycamore (Platanus occidentalis) trees.

The eastern red cedar (Juniperus virginiana) tree also measures 24 inches in caliper. It is located on the steeply sloped bank between the north façade of the House and adjacent gravel driveway. Erosion of the bank may cause undercutting of the tree roots.

## COMMENTS

All of the trees near the House appear to be in good condition but should be evaluated by a certified arborist.

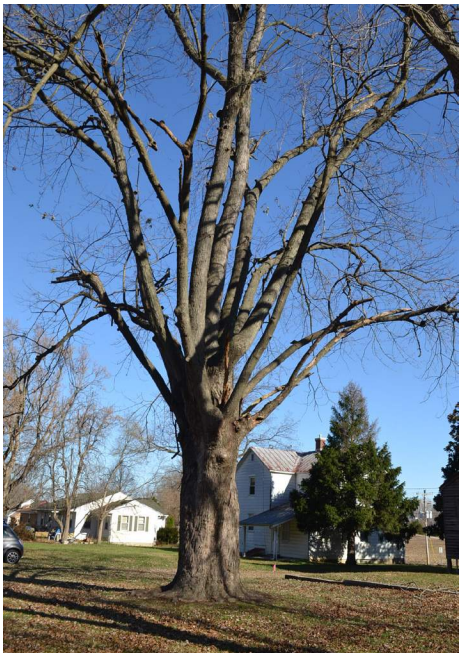


Figure L-20: View of the large sugar maple west of the House. (Source: LSHLA, 2020)

Figure L-21: View east of the eastern redcedar tree near the north porch. (Source: LSHLA, 2020)

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G20** | **SITE IMPROVEMENTS** | | |
| | **G2059** | **OTHER LANDSCAPE FEATURES** | |
| | | **G205902** | View East Toward the Common Field |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Fair |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The view east from the Bauvais-Amoureux House is toward the Common Field, present by the early 19th century. This visual connection provides an important historical association for the property related to agricultural and residential land use patterns representative of French agricultural villages during the period. The Common Field is maintained in open space and continues to be cultivated today.

The settlement pattern of "new" St. Genevieve was composed of a grid layout of streets and a compact residential cluster, with long agricultural parcels to the east in an adjacent "Common Field" *(Re: Figure 30)*. In addition to the village and Common Field were the "commons", which was an area recognized as communal for pasturing and harvesting timber. At Ste. Genevieve, the commons were understood to be any lands outside the village and the Common Field. The village cluster, the Common Field, and the commons is the community arrangement unlike settlement patterns of many other European ethnic groups and fits the settlement type of a "Planned French Village".[1]

The view from the House and from the field toward the House is currently impacted by the presence of a late 20th century commercial building located east of St. Marys Road across the street from the Bauvais-Amoureux House *(Re: Figure 32)*. Associated with the building are parking areas and cars, boats, and other stored vehicles and equipment.

## COMMENTS

The integrity of the view to the Common Field is diminished by the boat repair shop across St. Marys Road to the east.

1 National Park Service, Ste. Genevieve Final Special Resource Study and Environmental Assessment, p 3-7.

Figure L-22: View east toward the Common Field from the lawn south of the Bauvais-Amoureux House. (Source: LSHLA, 2020)

Figure L-23: View east of the adjacent commercial structure with the Bauvais-Amoureux House to the left. (Source: LSHLA, 2020)

Figure L-24: View toward the House from the Common Field. (Source: LSHLA, 2020)

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G20** | **SITE IMPROVEMENTS** | | |
| | **G2016** | **MARKINGS AND SIGNAGE** | |
| | | **G201601** | Identity Sign |
| | | **Date:** | c. 2019 |
| | | **Condition:** | Good |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | Low |

## DESCRIPTION

Following NPS acquisition of the property in 2018, an identity sign was installed to face St. Marys Road east of the House. The sign sits adjacent to the house atop the terrace west of the road. The wooden sign has routed white painted lettering that reads "Amoureux House" and includes the NPS arrowhead logo. The sign face measures 6 feet in length and is 2 feet tall and 1-1/2 inches wide. It is composed of a wooden panel supported by two 2x4 wood posts. The sign face has routed white painted lettering identifying the *"Amoureux House"*. The identity sign is in good condition.

Note: This sign was removed and replaced by NPS in August 2021.

## COMMENTS

The sign is in good condition but may be subject to erosion due to its location atop a slope.

Figure L-25: View west of the NPS identity sign for the House set within the slope facing St. Marys Road. (Source: LSHLA, 2020)

| G | BUILDING SITE WORK | | |
|---|---|---|---|
| G10 | SITE PREPARATION | | |
| | G1022 | SITE COMPONENTS FOR DEMOLITION | |
| | | G102202 | Concrete Pad |
| | | Date: | Undetermined |
| | | Condition: | Good |
| | | Contributing: | Unevaluated |
| | | Repair Priority: | Low |

## DESCRIPTION

A small concrete pad is set in the turf grass between the west façade of the House and the eastern edge of the gift shop foundation. The pad measures 7 feet, 4 inches in length and is 32 inches wide. It ranges from flush with the ground to 2 inches in height.

## COMMENTS

The function of the pad is not known, but it may have been associated with HVAC or other utility features associated with the former gift shop.

Figure L-26: View east of the concrete pad adjacent to the west façade of the House. (Source: LSHLA, 2020)

## DESCRIPTION OF ENVELOPE SYSTEMS — EXISTING CONDITIONS DOCUMENTATION

The exterior walls of the House on the north, east, and west walls are covered with cedar weatherboard (lap) siding and cedar trim boards. The south wall is finished with lime plaster on lath. On the north and south walls below the gallery decks, the vertical logs are exposed and finished with a failed clay parge coat and paint or limewash. The roofing is cedar tapersawn shake.

Further information on the envelope systems is provided in the *Abbreviated Structural and Envelope Assessment* report, included as Appendix C.

| | | | |
|---|---|---|---|
| **B** | **SHELL** | | |
| **B20** | **EXTERIOR ENCLOSURE** | | |
| | **B2010** | **EXTERIOR WALLS** | |
| | | **B201001** | Weatherboard Siding |
| | | **Date:** | 2007 |
| | | **Condition:** | Fair |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

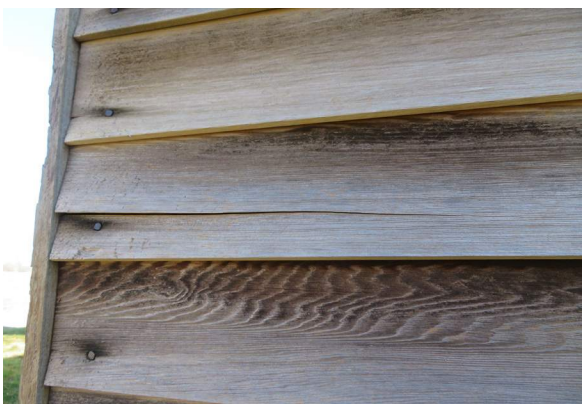
The earliest historic photographs of the House show wood weatherboard (lap) siding on the north, east, and west walls. The south wall does not appear to have been sided historically.

The existing weatherboard siding was installed in 2007 (Figure EN-01). Un-tapered cedar boards were installed at the east and west end walls, and tapered boards installed at the enclosed north gallery. The existing siding has a 5-inch exposed faces, although historically the exposure appeared to have closer spacing, with perhaps 4.5-inch exposures.

The existing siding is unfinished. In the c. 1916 photograph of the House, the east and north walls appear to be painted white or limewashed. It is unclear from the earlier photographs if the siding was finished before c. 1916; a c. 1900 photograph of the Bequette-Ribault House shows unfinished weatherboard siding on the south wall and white plaster on the east wall, suggesting how the Bauvais-Amoureux House may have appeared prior to c. 1916.

The fasteners are reproduction nails. The exposed vertical nail spacing appears to generally follow the nail patterns shown in early photographs. The siding is installed over asphaltic building paper that has been applied over the vertical logs and frame walls; the building paper stops at the top plate and does not continue up the gable end walls. Sheet metal flashing is present at window heads.

The siding is in aged condition. Numerous locations of warped, split, loose siding boards, and missing nails were documented (Figures EN-02 and EN-03). One missing board was observed at the east wall of the north gallery, exposing the building paper underlayment. Animal damage, likely from squirrels, was present on trim board at multiple locations.



↑↑ Figure EN-01. Cedar siding at the west wall, showing vertical pattern of exposed nails.

↑ Figure EN-02. Warped, split, and loose siding boards at the east wall.

→ Figure EN-03. Warped, split, and loose siding boards at the west wall of the north gallery.

| | | | |
|---|---|---|---|
| **B** | **SHELL** | | |
| **B20** | **EXTERIOR ENCLOSURE** | | |
| | **B2010** | **EXTERIOR WALLS** | |
| | | **B201002** | Exterior Plaster |
| | | **Date:** | Unknown (20th Century) |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The south wall above the gallery deck is finished with lime/sand plaster, reinforced with straw, and applied over wood lath. The plaster is of unknown date but appears to either be a fairly modern application or to have been recently heavily repaired, possibly dating to the 1960s restoration with later repairs. The plaster is finished with limewash.

The plaster is in good condition with only minor hairline cracking. No areas of potentially debonded or deteriorated plaster were identified.

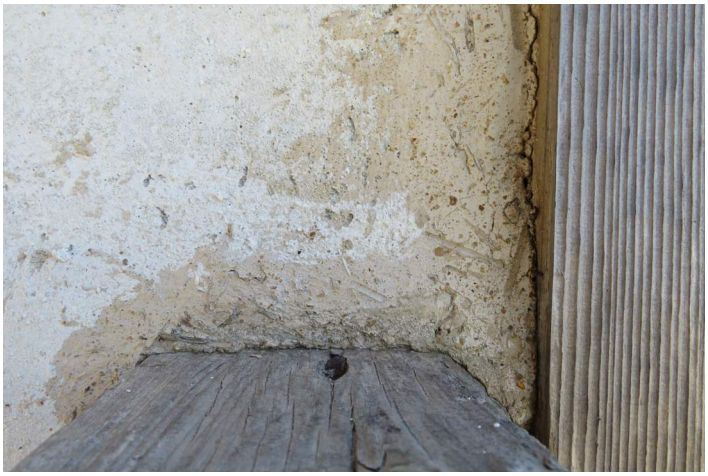


Figure EN-04. Detail of plaster texture at southeast corner at the handrail, showing large aggregate of sand and straw reinforcing.

Figure EN-05. Minor cracking at upper left corner of window.

| B | SHELL | | |
|---|---|---|---|
| B30 | ROOFING | | |
| | B3010 | ROOF COVERINGS | |
| | | B201001 | Wood Shake Roofing |
| | | Date: | 2007 |
| | | Condition: | Poor |
| | | Contributing: | Non-Contributing |
| | | Repair Priority: | High |

## DESCRIPTION

The earliest historic photographs of the House from c. 1900 show wood shingle roofing. Wood shingle roofs were common regional practice by the latter half of the 18th century. If the c. 1792 roofing was thatch, as is supposed based on the extant liteaux and lack of nail holes, it is likely that it was replaced with wood shingles early and that wood shingles have been the primary roofing treatment for much of the House's history.

The existing wood tapersawn shakes were installed in 2007 to replace a metal roof installed c. 1963. The existing tapersawn shakes are cedar, 18 inches long by widths ranging from 3 to 8 inches with an approximately 5-inch exposure. The tapersawn shakes are installed with triple head lap and nailed to the skip sheathing with two concealed nails per tapersawn shake. Concealed roofing felt appears to be interlaced between courses. The ridge detail is a "Boston" style (or capped ridge) with horizontal, lapped tapersawn shakes.

Lead-coated sheet metal flashing is present at the stone masonry chimney. Concealed metal flashing is also present at the ridge and the change in pitch at the gallery roofs.

The existing tapersawn shakes are deteriorated along the eaves and the north gallery roof slope. The exposed faces are eroded, and the tapersawn shakes exhibited warping and splitting. Animal damage, likely from squirrels, was visible along the rake edges and at the ridge. Park staff reports that multiple locations of water intrusion continue to recur despite repairs to the roofing, particularly along the north gallery. Multiple other locations of small leaks and spots of daylight were observed on the underside of the tapersawn shakes from the attic.

↑↑↑ Figure EN-06. Cedar tapersawn shakes at the south gallery roof, looking east.

↑↑ Figure EN-07. Deterioration and erosion of exposed face of cedar tapersawn shake.

↑ Figure EN-08. Deterioration of tapersawn shakes at the south eave.

→ Figure EN-09. Moss and algae growth on the north roof slopes.

| | | | |
|---|---|---|---|
| **B** | **SHELL** | | |
| **B30** | **ROOFING** | | |
| | **B3016** | **GUTTERS AND DOWNSPOUTS** | |
| | | **B301601** | Gutters and Downspouts |
| | | **Date:** | 2007 |
| | | **Condition:** | Poor |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | High |

## DESCRIPTION

A galvanized steel half-round gutter is present at the eave of the south gallery and connects to a round galvanized downspout at the southwest corner. No gutter is present on the north gallery eave.

The gutter appears to be an early-20th century feature. The c. 1900 photographs of the House do not show gutters, but the c. 1916 photograph does show a half-round gutter on the south eave only. The north eave does not appear to have ever had a gutter.

The galvanizing on the steel sheet inside the gutter trough has failed and the steel is corroded. The downspout is currently connected to a partially buried extension that runs along the west wall and daylights near the north drive. The buried PVC piping appears to be damaged, and the downspout extension is leaking at the northwest corner, contributing to the erosion and deterioration of the vertical logs at this area.

⇈ Figure EN-10. Corrosion of the galvanized gutter at the south eave.

↑ Figure EN-11. Corrosion of the galvanized round downspout at the southwest corner.

| | | | |
|---|---|---|---|
| **B** | **SHELL** | | |
| **B20** | **EXTERIOR ENCLOSURE** | | |
| | **B2010** | **EXTERIOR WALL CONSTRUCTION** | |
| | | **B201002B** | Exterior Plaster Below Gallery Decks |
| | | **Date:** | Unknown |
| | | **Condition:** | Failed |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | High |

## DESCRIPTION

Below the galleries on the north and south walls, the exterior log walls are finished with a thin covering of plaster and a white coating (EN-12 and EN-13). The 1936-40 HABS photographs show this area was previously covered with plaster on wood lath; the nail holes for the lath are readily visible in the exposed faces of the vertical logs.

The existing covering is of unknown date but appears to be a fairly modern application. The white coating appears to be a combination of a polymer film-forming coating (like paint) and limewash. There are several applications of the plaster skim coat which appear to be cement-based and lime-based in various places. The plaster and coating have failed, exposing the logs and pierrotage.

Figure EN-12. Failed exterior plaster and limewash at below the south gallery deck.

Figure EN-13. Failed exterior plaster and limewash at below the north gallery deck.

## DESCRIPTION OF ARCHITECTURAL INTERIOR FEATURES AND MAJOR COMPONENTS — EXISTING CONDITIONS DOCUMENTATION

Each element is numbered and coincides with the Architectural drawings, included in Appendix A. All photographs included in this section were taken by BVH Architecture during the field work assessment completed in November 2020.

| | | | |
|---|---|---|---|
| **C** | **INTERIORS** | | |
| **C30** | **INTERIOR FINISHES** | | |
| | **C3010** | **WALL FINISHES** | |
| | | **C301001** | Interior Walls and Trim |
| | | **Date:** | c. 1792; 1880–1923; 1960s; 1960s–2000s |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Contributing and Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The wall surfaces consist of a large variety of materials and time periods. Due to the original time period of the building's construction and the current settlement and deformed beams and structure, the walls are in good condition overall which indicates that they have been repaired in the recent past. There are minimal cracks in the surfaces. These wall repairs and their actual materials and methodologies are unknown and will require some destructive investigation to learn more.

The wall, door and window interior trim also appear to be from multiple time periods. Further analysis of these elements will be required to date the elements in order to ascertain if they are original or reproductions. Where reproductions have been installed, the review of the usage of these for a particular time period should also be considered during the building's interpretive goals.

↑ Figure A-01. 103-Room A, looking East. Wood trim and plaster walls over palisaded c. 1792 wall construction. Chicken wire used as reinforcement in the south wall plaster suggests the plaster dates to the 1960s restoration.

→Figure A-02. 102-Room B, looking West. Wood trim and plaster walls over palisaded c. 1792 wall construction at south and stone chimney. Previous investigations by others in 1994 indicate that the west wall of Rooms A-B is palisaded construction and was plastered over in c. 1845 / during the major renovation of c. 1852.

Figure A-03. 103-Room A (left) to 102-Room B (right) trim connections, looking East. This detail photo indicates, at the left side of the photo, where the wall between Rooms A and B used to be installed (during the 1994 work it was believed to have been installed in c. 1845 / during the major renovation of c. 1847 - c. 1852 and was removed c. 1960). The interesting features here show that the trim in Room A is square edged and has a smaller cove base molding and the elements are painted gray. The trim in Room B has a profiled top edge and different cove base molding and the elements are painted an ocher color. Electrical intrusions are also shown.

Figure A-04. 104-Room C, looking East. This room has multiple wall materials and finishes (vertical natural, wide beaded wood boards and plaster) and multiple trim types and finishes (natural wood and painted wood). Previous investigations by others in 1994 indicate that this wood wall was installed in c. 1845 / during the major renovation of c. 1847 - c. 1852.

Figure A-05. 104-Room C, looking South. This view of this room shows the partial wall construction exposing the wood lathe and plaster next to the brick chimney flue in the corner that once connected to a wood stove (pipe covers still evident). These features are believed by the 1994 study to have been installed in c. 1845 / during the major renovation of c. 1847 - c. 1852. The plaster at the chimney is rough and irregular and not finished well. The walls also appear to be painted over wallcovering.

Figure A-06. 100-Room D, looking East. This room has multiple wall materials and finishes (vertical natural, wide beaded wood boards and plaster) and multiple trim types and finishes (natural wood and painted wood). The wood wall is continuous. The wall between Rooms C and D is of a newer era and was installed prior to 1956 (HABS).

←← Figure A-07. 101-Hall, SW Corner. The hall also has multiple finishes (vertical natural, wide beaded wood boards and plaster) and multiple trim types and finishes (natural wood and painted wood).

← Figure A-08. 101-Hall. The c. 1792 chimney stone has been exposed and the original plaster removed. This is evident at the base of the wall, just behind the wood baseboard trim. You will notice the stone has a precise mortared stone edge for the plaster to be installed.

Figure A-09. 106-North Porch, looking West. This space is not original and was demolished and reconstructed as an enclosed porch with walls (drywall) and windows c. 1963. The original palisaded wood log construction from c. 1792 is intact. All of the original exterior wood siding (1956 HABS) or possible original stucco finish have been removed.

| C | INTERIORS | | |
|---|---|---|---|
| C30 | INTERIOR FINISHES | | |
| | C3020 | FLOOR FINISHES | |
| | | C302001 | Flooring |
| | | Date: | Possibly c. 1792. Possibly c. 1852. With later additions of date unknown. |
| | | Condition: | Good |
| | | Contributing: | Contributing and Non-Contributing |
| | | Repair Priority: | Low |

## DESCRIPTION

The floor materials are all made of wood. Multiple conditions and time periods exist. The wood floor board widths vary depending on the room. There are multiple door, saddle threshold types, and the floor heights vary.

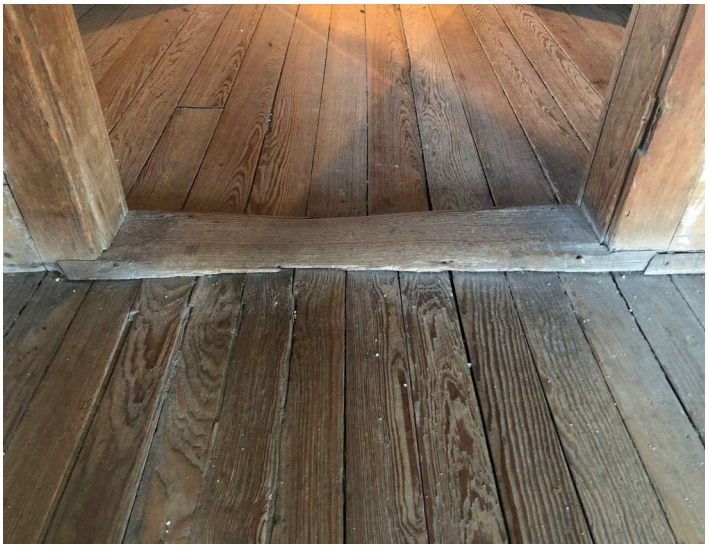
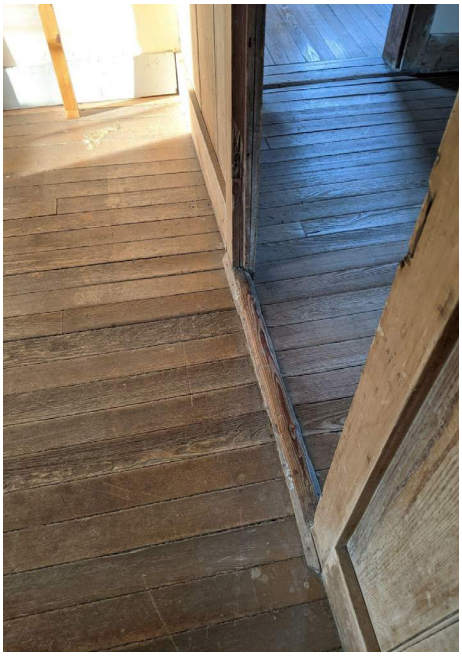


Figure A-10. 102- Room B at bottom to 101-Hall at top. These two rooms are most likely from very early in the building's construction time period and show early connections to the door openings and walls, but further investigations will be required. The wood orientations are consistent, but the board widths do not match.

Figure A-11. 106-North Porch at bottom to 101-Hall at top. The north porch flooring is wood but was installed in c. 1963.



←← Figure A-12. 104-Room C, left to 101-Hall at right. The wood flooring between these two rooms is continuous under the wood wall partition, most likely dating these floors to very early in the buildings construction time periods, they are either original to c. 1792 or previous investigations by others in 1994 indicate that this wood wall was installed in c. 1845, (during the major renovation in c. 1847 - c. 1852) which would indicate the floor is this possible construction date as well. The dating of the wood wall and further investigations will help to determine this.

← Figure A-13. 100-Room D at left to 104-Room C at right, at Door 100B. The wood floor in Room D has been added on top of another floor layer at an unknown date.

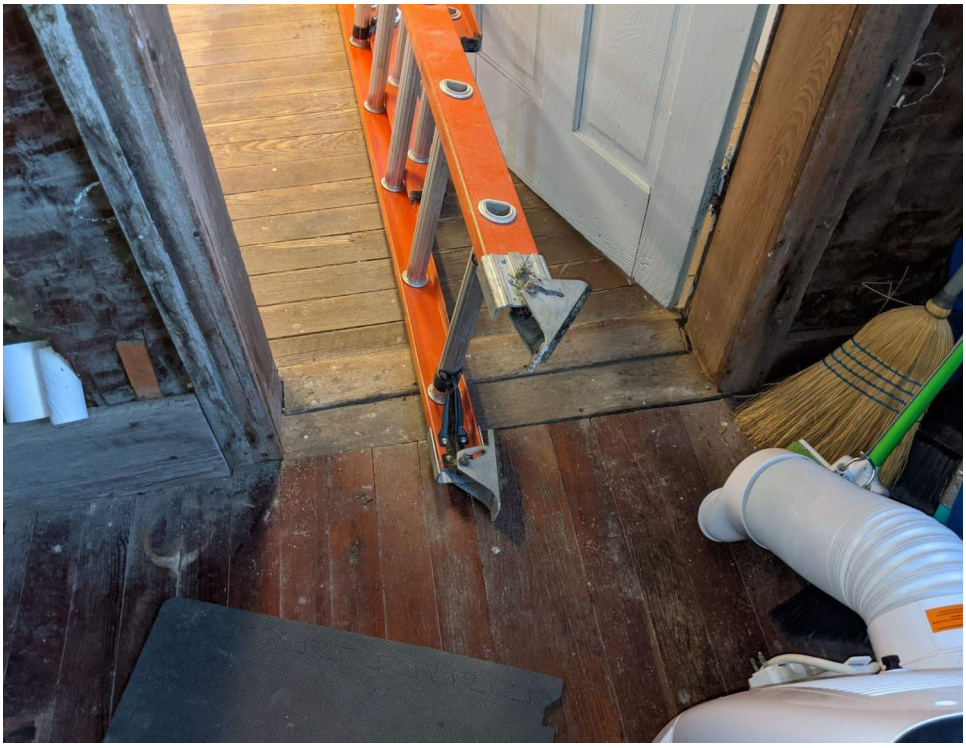


Figure A-14. 107-Restroom at bottom to104- Room C at top. This flooring connection is through an early exterior wall opening dating to at least prior to 1956 (HABS).

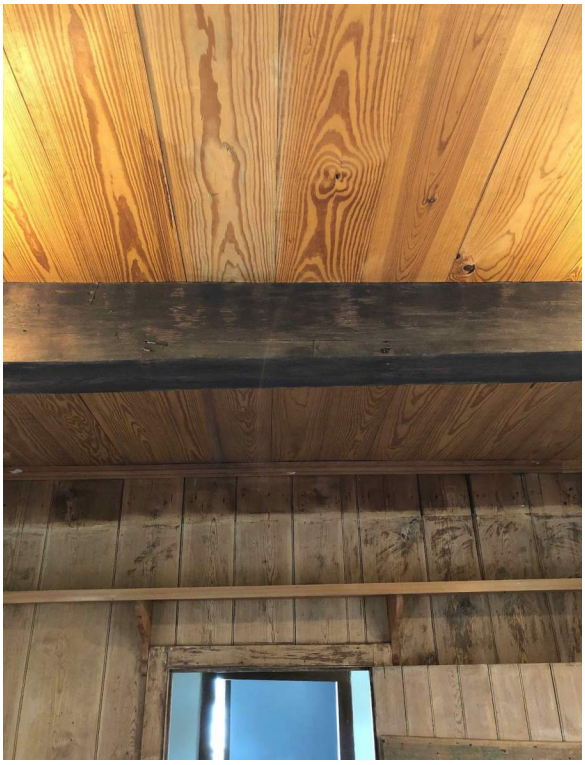
| C | INTERIORS | | |
|---|---|---|---|
| C30 | INTERIOR FINISHES | | |
| | C3030 | CEILING FINISHES | |
| | | C303001 | Beams and Ceilings |
| | | Date: | c. 1792. Unknown dates |
| | | Condition: | Fair |
| | | Contributing: | Contributing and Non-Contributing |
| | | Repair Priority: | Moderate to Low |

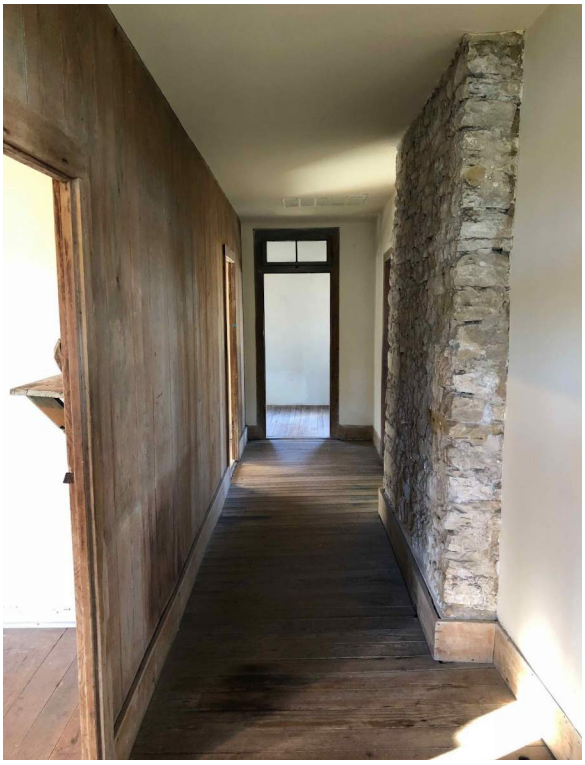
## DESCRIPTION

These components indicate Multiple conditions and time periods with each element having individual detailing. All components are wood but multiple wood types are used. The prior 1994 study indicates that a c. 1840 (or during the major renovation in c. 1847 - c. 1852) plaster ceiling used to be installed throughout the first floor ceilings and was removed in c. 1960.

← Figure A-15. 103-Room A and 102-Room B beaded profile edge timber beams and wood ceiling / attic floor boards appear to be original to c. 1792. The beams are hewn and show a very precise and interesting beaded edge along their full length at both bottom edges. It needs to be noted that if a prior plaster ceiling was installed in this space during the major renovation of c. 1847 - c. 1852, the beaded edge of these beams were covered over in that campaign. The ceiling floor boards are hand planed and secured to the beams with forged nails. The ceiling boards are in Fair condition and are made of random widths and longer inconsistent lengths.

↑ Figure A-16. 04-Room C has square edged timber beams with wood ceiling boards. These ceiling boards / attic floor boards are in much better condition than those in rooms A and B. The boards in Room C are standard consistent lengths that only span from one beam to the next. They are also consistent board widths. The beams are cut and smoothly finished. The beam seen second from left was identified by Jack Luer in 1994 as having hail hole patterns consistent with a (now missing) palisaded wall.





↑ Figure A-17. 100-Room D, square edged timber beams with wood ceiling boards, looking East. The conditions here match those of Room C.

← Figure A-18. 101-Hall, looking North. The ceiling in this hallway is new and appears to be drywall attached to the wood beam framing above. An older plaster ceiling appears to be concealed above the drywall.

↓ Figure A-19. 106-North Porch, looking East. Wood bead board ceiling installed in c. 1963. This ceiling has prior water damage in its entirety.

| | | | |
|---|---|---|---|
| **B** | **SHELL** | | |
| **B20** | **EXTERIOR ENCLOSURE** | | |
| | **B2021** | **WINDOWS** | |
| | | **B202101** | Windows |
| | | **Date:** | c. 1852 design. Most likely created/major repairs in 1960s-2000s |
| | | **Condition:** | Fair to Poor |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

The window fenestration that exists is from multiple time periods. There are some units missing in their entirety. It does not appear that any of the windows contain historic original materials. The conditions vary but overall each unit needs significant repair work.

Figure A-20. South Porch Window 101. Typical window type and configuration. Recreated c. 1852 shutters are fixed to the wall and inoperable.

Figure A-21. East and West Facade Windows at First Floor typical window type and configuration and condition.

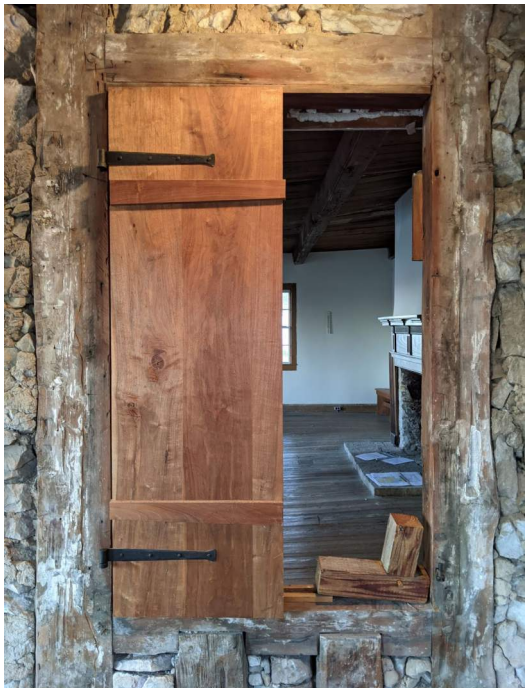


Figure A-22. 106-North Porch, Window opening 106, looking into 103-Room A. This opening shows the c. 1792 timber framed rough opening. This opening has reproduction c. 1792 shutters and hardware installed.

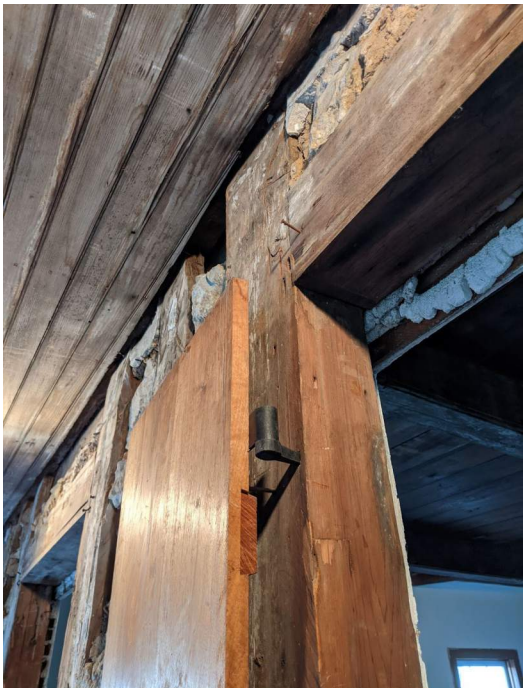


Figure A-23. 106-North Porch Window opening 106. This opening has reproduction c. 1792 shutters and hardware installed. The shutter hardware hinge appears to be in the original framing location.

Figure A-24. 106-North Porch, Window opening 105, looking into Room A. This opening shows the c. 1792 timber framed rough opening.

Figure A-25. Typical 106-North Porch Windows are in Poor condition and were installed in c. 1963.

| | | | |
|---|---|---|---|
| **B** | **SHELL** | | |
| **B20** | **EXTERIOR ENCLOSURE** | | |
| | **B2030** | **EXTERIOR DOORS** | |
| | | **B203001** | Doors |
| | | **Date:** | Some elements are likely from c. 1792, c. 1852, and other modern eras |
| | | **Condition:** | Fair |
| | | **Contributing:** | Contributing and Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

There are multiple door conditions & time periods evident with numerous door & trim styles and missing doors. There are also numerous hardware types and locations with missing hardware and evidence of prior hardware locations.

← Figure A-26. 101-Hall, South Door out to South Porch. Door 101 has numerous prior repairs evident in numerous locations. The door appears to have been adapted / altered to fit this current opening. There are holes through the door on the opposite side for prior hardware lock and handle. Stiles have been cut, exposing mortise interior at edges.

↑ Figure A-27. 106-North Porch, Door 101a, looking South. These two openings may possibly be from c. 1792 due to their central building location and matching elements in transom configuration, meeting rail design and wood trim profiles. But, the actual door and transom and trim date is unknown. These elements have features of very early construction, but further investigation and dating should be undertaken to ascertain dating of these elements.

↑↑ Figure A-28. 100-Room D, South Door out to South Porch. Door date is unknown. This door and Door 104 are very similar but unique to the building.

↑ Figure A-29. 100-Room D, East Door 100A (beyond is Door opening 102 into 102-Room B). This door design is unique to the building and is the only example. It is not clear if this door is a reproduction or is original to c. 1852. In prior notes, dating of this wall will help determine the date of the door as well.

← Figure A-30. 103-Room A, Door 103, west. This opening is within the original c. 1792 timber framing. The door opening is most likely from this era. Destructive investigation of the current plaster will help to determine this. This door opening, along with the opposite one to the south in room B have evidence on the wood jambs of prior hardware types and locations, from which era (possibly c. 1852) is unknown at this time.

| | | | |
|---|---|---|---|
| **E** | **FURNISHINGS** | | |
| **E20** | **FURNISHINGS** | | |
| | **E2010** | **FIXED FURNISHINGS** | |
| | | **E201001** | Fireplace Mantel |
| | | **Date:** | Unknown |
| | | **Condition:** | Good |
| | | **Contributing:** | Unevaluated |
| | | **Repair Priority:** | Low |

A-31. 103-Room A, looking West. Fireplace mantel. The actual dating of this mantel is not known. Due to the significant movement of the structural elements in this room and the current condition of the plaster surfaces, if this mantel dates to very early construction periods, it has been removed from its original location and reinstalled here. It is possible that it is of a much later time period because the 1956 HABS drawings do not note that this mantel exists or that there is a hearth in this space. Also, the HABS drawings show a wall between Rooms A and Room B existed at that time, located almost in the center of this mantel/ chimney location. It should be noted that the detailing of the stone hearth appears to be an added feature. Its connections and detailing to adjacent trim and wall surfaces and the wood flooring is peculiar.

| C | INTERIORS | | |
|---|---|---|---|
| C30 | INTERIOR FINISHES | | |
| | C3010 | WALL FINISHES | |
| | | C301002 | Exposed North Log Wall |
| | | Date: | c. 1792 |
| | | Condition: | Good to Fair |
| | | Contributing: | Contributing |
| | | Repair Priority: | Low |

← Figure A-32. 106-North Porch at east. Exposed c. 1792 wall construction and window framing. The exposure of these elements is one of the character defining features that shows visually why this building is so important. Further study of how much and where this feature should be exposed in the final rehabilitation building use should be carefully considered as part of the interpretive approach.

↑ Figure A-33. Stack of reproduction c. 1792 casement windows and shutters located at the 106-North porch. While these elements are important to see how a building from this very early time period once looked, this particular building has a much longer period of significance. How the building will be interpreted should be studied to ascertain how much visual display will show from each of the significant time periods.

| | | | |
|---|---|---|---|
| **C** | **INTERIORS** | | |
| **C30** | **INTERIOR FINISHES** | | |
| | **C3010** | **WALL FINISHES** | |
| | | **C301003** | Visual Evidence of Settlement Issues |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Fair to Poor |
| | | **Contributing:** | Contributing and Non-Contributing |
| | | **Repair Priority:** | High |

Figure A-34. 102-Room B at left, 103-Room A at right, looking west. The Attic and 1st floor framing deflections are highly visible in the beam and floor bowing, where the chimney and its solid foundation produces a crown in the middle of the building.

Figure A-35. 102-Room B, looking south. Downward bowed Attic Beams and flooring deflections and movement.

↑↑ Figure A-36. 102- Room B, looking South, at Window 102. Evidence of wall cracking starting to return to the surfaces.

↑ Figure A-37. 104-Room C, looking north. These two photos show significant wall cracking. This wall surface is the most deteriorated and cracked of all walls in the entire structure. The wood beam to wall connection joints have pulled away from their original locations approximately 1-½". There is a distinct horizontal crack running the walls entire length at the wood beam line.

← Figure A-38. 104-Room C, looking north at the west corner. Additional wall cracks at the surfaces above the door, horizontally at the wood beam and down the NW corner.

| C | INTERIORS | | |
|---|---|---|---|
| C30 | INTERIOR FINISHES | | |
| | C3030 | CEILING FINISHES | |
| | | C303002 | Concealed Plaster Ceiling |
| | | Date: | Unknown |
| | | Condition: | Fair |
| | | Contributing: | Unevaluated |
| | | Repair Priority: | Low |

## DESCRIPTION

Above the center hall, a plaster-on-lath ceiling is visible under the loose attic floorboards. The lath was supported by dimensional lumber running east-west and secured to the ceiling beams. The date of this ceiling is unknown and requires further study.

Figure A-39. Concealed plaster ceiling over center hall, seen from the attic under the loose floorboards.

Figure A-40. Concealed plaster-on-lath ceiling over center hall, seen near the south wall. Note the lath runs north-south, parallel with the ceiling beams.

## DESCRIPTION OF STRUCTURAL SYSTEMS — EXISTING CONDITIONS DOCUMENTATION

The exterior walls of the House on the north and south walls are constructed of vertical logs embedded in the soil (poteaux-en-terre construction), and the east wall is constructed of vertical logs that have been cut to bear on a wood sill on a stone masonry foundation. The original west wall was also constructed of vertical logs, but this wall has been removed and replaced with a wood frame wall with brick nogging on a stone masonry foundation. The voids between the vertical logs are infilled with stone and clay nogging, called pierrotage. The lateral bracing within the vertical log walls are hewn timbers, set horizontally rather than diagonally.

The first floor is structurally separate from the vertical log walls. The first floor is supported by timber edge beams that span east-west and are supported by stone masonry piers. The partially-hewn log joists spanning north-south bear on the timber edge beams. Multiple supplemental joists have been installed, and shoring has also been installed to provide additional support to the floor framing.

The primary roof framing is a truss system, consisting of "Norman" trusses (a variation of the king-post truss) spanning north-south and bearing on ceiling beams. The ceiling beams are dovetailed into a double top plate that sits on the top of the wall logs. A ridge truss runs east-west to brace the Norman trusses against the central stone masonry chimney. The primary roof rafters span from the ridge beam, are supported at midspan by a continuous purlin, and bear on the top plate. The roof framing for the c. 1847 galleries at the north and south walls is constructed of secondary rafters that align with the primary rafters and are supported at midspan by a purlin on vertical posts. The east end gable wall is constructed from partial-hewn poles, and the west end gable wall is constructed from dimensional lumber.

Further information on the structural systems is provided in the *Abbreviated Structural and Envelope Assessment* report, included as Appendix C.

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|---|---|---|---|
| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B1020** | **ROOF CONSTRUCTION** | |
| | | **B102001** | Norman (King-Post) Trusses |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Good to Fair (damage to some members) |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | High |

## DESCRIPTION

The primary roof framing is formed by Norman trusses (S-01). The truss members are hewn red and white oak, nominally 5 by 7 inches in size. The top chords of the truss are the main diagonal members, and the horizontal collar tie, located at midspan of the top chords, forms the distinctive "A" shape of a Norman-style truss. The king post is the vertical member spanning from the collar tie to the apex of the truss. The top chords bear on the ceiling beams. The connections between members are mortise and tenon with trenails (wood pegs) (S-02). The original hip framing is still present at the east end (S-03), but the west hip framing has been removed.

Carpentry marks were found on each of the timber truss members, numbering the Trusses from II to VI (west to east) (S-04). Truss I is no longer extant, but a fragment of one of the top chord members was located in the caveau, where it was repurposed as a supplemental floor joist.

Termite damage was present at the bearing end of multiple trusses (S-05). At the apex of Truss VI at the east end, the top ends of the truss members and the connection of the hip framing to the king post of Truss VI had significant water damage (S-06).

Figure S-01. View of Truss V, looking west.

Figure S-02. Mortise and tenon connection between truss top chord and collar tie.

Figure S-03. Original hip roof framing still in place at the east end wall.

Figure S-04. Carpenter's mark on a top chord of Truss VI at the east end.

Figure S-05. Termite damage to the bearing end of Truss IIII and the ceiling beam.

Figure S-06. Deterioration of the king post and top chord connection at Truss VI.

| B | SHELL | | |
|---|---|---|---|
| B10 | SUPERSTRUCTURE | | |
| | B1020 | ROOF CONSTRUCTION | |
| | | B102002 | Ridge Braces Trusses |
| | | Date: | c. 1792 |
| | | Condition: | Good to Failed |
| | | Contributing: | Contributing |
| | | Repair Priority: | High |

## DESCRIPTION

The ridge brace trusses are flat trusses, running east-west, that provide lateral bracing for the Norman trusses. The truss members are red oak and are nominally 3 by 5 inches in size. The top chord of the ridge brace truss serves as the roof ridge beam. The ridge beam is connected to the top end of the king post at each Norman truss. The intermediate diagonal struts connect the top and bottom chords. The ridge brace trusses are supported by the central stone masonry chimney. The connections between the wood members are all mortise and tenon with trenails.

Differential settlement of the exterior walls relative to the stone masonry chimney has damaged the ridge brace truss where they pocket into the masonry. At the east side of the chimney, the top and bottom chords are displaced, and the diagonal strut to the truss king post is partially missing (S-07). At the west face of the chimney, the top and bottom chords are displaced, and the bottom chord member has cracked (S-08). The visible displacement of the bottom chord is greater than that of the top chord because the top chords were re-leveled during repairs to the roof performed in 2007.

At the west end of the roof, the ridge brace truss is missing to the west of Truss II and was likely removed at the same time as Truss I, the west hip framing, and the west vertical log wall. The mortise for the connection of one of the missing diagonal struts is partially intact (S-09).

↑ Figure S-07. Ridge brace truss at the east side of the chimney, showing displacement of the bottom chord and partially missing diagonal strut.

□ Figure S-08. Ridge brace truss at the west side of the chimney, showing failed (cracked) bottom chord.

→ Figure S-09. Cut end of ridge beam at the west end of the roof, showing partially intact mortise for now missing diagonal strut.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B1020** | **ROOF CONSTRUCTION** | |
| | | **B102003** | Primary Roof Rafters |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Good |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The primary roof rafters are hewn red oak, nominally 3 by 5 inches. The rafters bear on the ridge beam at the apex of the roof and bear on the top plate at the north and south vertical log walls (S-10). A continuous, hewn oak, horizontal purlin is located approximately at the rafters' midspan. At the ridge beam, the rafters are notched and lapped. The bearing end of the rafters are toe nailed to the top plate with wrought nails. All the extant rafters appear to be original (S-11).

No insect or water damage was observed on rafter members, but several rafters, particularly on the south roof slope were displaced at the bearing end.

At the east end, the original hip rafters are still mostly in place. The center rafter that connected to the apex of Truss VI is missing.

← Figure S-10. Primary rafters and horizontal purlin just west of Truss II.

↑ Figure S-11. Primary rafters bearing on the south top plate with wrought nails.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B1020** | **ROOF CONSTRUCTION** | |
| | | **B102004** | Secondary (Gallery) Rafters |
| | | **Date:** | c. 1847 - c. 1852 |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The secondary rafters span from the primary rafters to the gallery edge beam to form the roofs of the galleries at the north and south walls. The rafters are partially hewn poles, approximately 5 to 6 inches in diameter, and are formed of a mix of locally available hardwoods and softwoods (S-12). The secondary rafters align with the primary rafters but are set at a lower slope to form the distinctive broken pitch roof shape. The secondary rafters are toe nailed to the primary rafters with cut nails and have a "birdsmouth" cut at the bearing end. An intermediate purlin on vertical posts supports the secondary rafters approximately midspan (S-13). The rafter tails extend beyond the gallery perimeter beam approximately 12-inches to form an eave.

Approximately 8 secondary rafters have been partially replaced in kind with a splice connection at the purlin. Multiple rafter tails have also been replaced, likely due to deterioration. Rafter tails that appeared to be original exhibited deterioration of varying severity.

Figure S-12. Secondary rafters at the south gallery, looking west.

Figure S-13. Secondary rafters at the north gallery with the intermediate purlin and vertical posts, looking east.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B1020** | **ROOF CONSTRUCTION** | |
| | | **B102005** | Skip Sheathing |
| | | **Date:** | c. 1847 - c. 1852 |
| | | **Condition:** | Good to Failed (variable) |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | High (with roofing replacement) |

## DESCRIPTION

Open or "skip" sheathing was applied over the primary and secondary rafters to support the wood roof shingles. The boards appear to be nominally 6 to 8 inches wide by 1-inch thick, are typically set with 3 to 4-inch gaps between boards and are a mix of vertical and circular-sawn wood (S-14). Numerous cut and wire nails are visible from the undersides of the boards, evidence of multiple generations of roofing replacement (S-15). The attachment of the skip sheathing boards to the rafters could not be observed from the underside of the roof.

The skip sheathing boards appear to be mostly original or early fabric with limited modern replacement boards. Some boards are severely deteriorated.

Figure S-14. Skip sheathing visible from the grenier interior, showing deterioration of sheathing boards.

Figure S-15. Multiple generations of cut and wire nails from past roofing replacements were present.

| B | SHELL | | |
|---|---|---|---|
| B10 | SUPERSTRUCTURE | | |
| | B1020 | ROOF CONSTRUCTION | |
| | | **B102006** | Original Roofing Battens |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

Several locations of hand-riven liteaux (battens or stripping to which the c. 1792 roofing was attached) are still fastened to the primary rafters with wrought nails on the north and south (S-16 through S-19). All the extant liteaux are located below the line of the current gallery roofs. The placement of the extant liteaux, along with abandoned wrought nails still in place and nail holes on the outside faces of the primary rafters, suggests that the c. 1792 roofing was applied from ridge to top plate without interruption by gallery roof framing.

The original roofing may have been thatch. No evidence of thatching was found during the physical investigation for the historic structure report; however, the liteaux do not have patterns of nail holes to suggest that they once received wood shakes. See sections "A Question of the Galleries" and "To Thatch or Not to Thatch" for additional discussion.

←← Figure S-16. Intact liteaux at the northeast corner of the primary roof, looking east.

← Figure S-17. Partially intact liteaux at the north slope of the primary roof, looking west.

←← Figure S-18. Liteaux in S-16 attached to the primary rafter with wrought nails.

← Figure S-19. Liteaux in S-16 attached to the primary rafter with wrought nails.

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| **A** | **SUBSTRUCTURE** | | |
| **A10** | **FOUNDATIONS** | | |
| | **A1020** | **SPECIAL FOUNDATIONS** | |
| | | **A102001** | Exterior Vertical Log Walls |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Fair to Poor |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | High |

## DESCRIPTION

The exterior walls of the House were originally constructed of vertical red cedar logs that act as bearing walls to support the roof framing. The logs are approximately 7 to 10-inches wide and are set directly into the earth with variable spacing of 5 to 12 inches between logs that are infilled with limestone and clay pierrotage. The vertical logs are continuous from the foundation to the top plate except at locations of lateral wall bracing. Below grade, the logs are unshaped (S-20). Above grade, the log-to-log faces are slightly concave to key in the pierrotage, and the exterior faces are hewn flat. At the top of the wall, the logs are notched to receive the double top plate and are connected to the top plate with two wrought nails (S-21).

The vertical log walls appear to be in their original condition at the north and south walls, and the pierrotage appears to be mostly original where it was visible. At the east end wall, the original vertical logs are still in place, but have been cut above grade to bear on a wood sill on a stone masonry foundation; this modification was performed at an unknown date and was likely due to deterioration of the logs. The original log west end wall was entirely demolished, along with a stone masonry chimney at an unknown date and replaced with a dimensional lumber frame wall and brick chimney.

At the north and south walls, above grade, the logs are in good condition with little evidence of distress or deterioration. However, the logs were found to be deteriorated below grade, resulting in a significant loss of structural capacity (S-22). Differential movement between the exterior walls and the central chimney is also occurring and is readily visible in the displacement of the grenier floor.

↑↑ Figure S-20. Vertical logs visible from the inside the caveau, showing the transition from unhewn to hewn logs.

↑ Figure S-21. Vertical log at the north wall (now an interior wall) exposed to show the connection to the top plate.

→ Figure S-22. Below-grade deterioration of the vertical logs at the northwest corner, exposed due to soil erosion and animal burrowing.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B2011** | **EXTERIOR WALL CONSTRUCTION** | |
| | | **B201101** | Exterior Wall Lateral Bracing |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Good |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

Lateral bracing of the vertical log walls was part of the original construction. The lateral bracing is horizontal, rather than vertical, which is somewhat unusual for French vernacular buildings in Ste. Genevieve; only the Vital St. Gemme Beauvais House, another poteaux-en-terre structure also constructed c. 1792, has horizontal lateral bracing.

The bracing is formed by hewn logs, likely red cedar, set horizontally in the wall, located approximately 3-feet below the top plate (S-23). This is roughly level with the original window and door heads. Similar to the top plate, the vertical logs are notched to fit around the horizontal bracing member and are fastened with two wrought nails (S-24). The logs are also slightly offset vertically at the bracing member.

Figure S-23. Area of lateral bracing at the north wall, evident by the discontinuous vertical logs.

Figure S-24. Connection of the vertical logs to the horizontal bracing member.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B2011** | **EXTERIOR WALL CONSTRUCTION** | |
| | | **B201102** | Pierrotage |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

The voids between the vertical logs are infilled with rough limestone units set in a clay binder called pierrotage. The clay binder did not appear to have straw or other vegetative material mixed in with the clay. At the east wall, the pierrotage was protected by the wood weatherboard siding; at the south wall, the pierrotage was protected by lime plaster on lath above the gallery decking. Below the gallery decking at the north and south, the pierrotage had been previously painted or lime washed and was partially exposed. At the original north wall (now an interior wall), the pierrotage and vertical logs are exposed for interpretive purposes. Inside the caveau, a thin clay parge coating had been applied to the logs and pierrotage.

Some areas of loss of the clay binder or limestone units were present where the pierrotage was exposed below the galleries (S-25). At the northwest corner, water and animal damage had caused a larger area of loss of pierrotage and logs. The clay binder was somewhat brittle and easily damaged. Repairs to the pierrotage made with Portland-cement based mortar had failed (S-26).

Figure S-25. Failed parging exposing the pierrotage under the south gallery deck.

Figure S-26. Failed cementitious repair to the pierrotage under the south gallery deck.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B2011** | **EXTERIOR WALL CONSTRUCTION** | |
| | | **B201103** | East End Gable Wall |
| | | **Date:** | c. 1847 - c. 1852 |
| | | **Condition:** | Good |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The east end gable wall is constructed from partially-hewn pole framing of 3 to 4-inch diameters, spaced at approximately 2 to 3-ft on center, and fastened with cut nails (S-27 and S-28). The gable wall framing sits on the original c. 1792 top plate and extends onto the end beams at the galleries. Several of the vertical framing members appear to be salvaged or repurposed rafters with birdsmouth notches at the bottom of the member. Further investigation is needed to determine if these members were salvaged from another location on the Bauvais-Amoureux House or if they came from another structure. Some of the framing around the gable window has been replaced with modern dimension lumber. Analysis of the nails and joinery detailing may also help inform the date of construction for the gable wall.

Figure S-27. East gable wall framing.

Figure S-28. Gable framing members fabricated from partially hewn poles and attached with cut nails.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B2011** | **EXTERIOR WALL CONSTRUCTION** | |
| | | **B201104** | West End Frame Wall and Gable Wall |
| | | **Date:** | 1880s - c. 1900 |
| | | **Condition:** | Good |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

At an unknown date, but likely in the second half of the 19th century, the original vertical log wall at the west end of the House was removed along with the westernmost roof truss. A new frame wall on a stone masonry foundation was constructed to the east of the original log wall location, permanently shortening the House by approximately 8 to 12 feet. The frame wall was constructed of 2 by 4-inch wood studs spaced at approximately 24 to 30 inches (S-29 and S-30). Brick nogging is present between the studs to the level of the top plate. The wood studs appear to be a combination of vertical and circular-sawn lumber. See section "The Question of the Galleries" for additional discussion on lumber.

Several studs at the gable appear to be modern replacement members or repurposed wood from another structure

Figure S-29. Frame construction at west gable wall, looking slightly south.

Figure S-30. Frame construction at west gable wall, looking slightly north.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B1010** | **FLOOR CONSTRUCTION** | |
| | | **B101001** | First- Floor Framing System |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Failed |
| | | **Contributing:** | High |
| | | **Repair Priority:** | Contributing (shoring non-contributing) |

## DESCRIPTION

Lateral bracing of the vertical log walls was part of the original construction of the exterior walls. The first-floor framing is independent of the vertical log exterior walls. The floor framing is constructed of two large diameter oak beams, running east-west, that are supported by masonry piers (S-31). Partially-hewn oak log joists run north-south and are notched at the bearing ends where they rest on the edge beams or sit in joist pockets where they intersect with the stone masonry chimney (S-32). The original hewn floor planks have been replaced with hardwood boards of an unknown date. The masonry piers are rubble limestone set in a clay mortar. The piers have been recently painted or limewashed.

Multiple supplemental joists have been installed at various dates. Some of the supplemental joists appear to be repurposed timbers from other structures (S-33) and some are hewn logs to match the original construction.

Most of the original first-floor structural members remain intact but are in a partially failed condition. Insect damage has caused significant loss of member section; some oak logs have lost all integrity, and only the bark remains of the original log (S-34). An extensive shoring system was installed in the 1990s to address deflection of the first floor after the Great Flood of 1993. This shoring system is now performing as the primary structural support for the first floor.

↑ Figure S-31. Floor framing and shoring from the west wall of the caveau, looking southeast; the edge beam is concealed by the shoring beam.

→ Figure S-32. Floor framing and shoring from the caveau door, looking west. Note the wood retaining wall in the middle foreground. This wall was constructed during the 1994 repairs to stabilize the change in grade of the caveau floor between the original (higher) grade and around the center which was excavated to its current depth sometime before the 1956 HABS drawings.

Figure S-33. Hewn oak timber at the far west end of the caveau. A carpentry mark of “I” was observed on the west face of the timber just north of the mortise pocket, indicating that this is one of the top chord members from missing Truss I.

Figure S-34. Termite damage to oak joist with only bark remaining and recently installed supplemental oak joist immediately to the right.

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| **B** | **SHELL** | | |
| **B40** | **OTHER STRUCTURES** | | |
| | **B4010** | **CHIMNEYS** | |
| | | **B401001** | Stone Masonry Chimney |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Good |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The stone masonry chimney is one of two stone chimneys constructed as part of the original house. The chimney at the west end wall is no longer extant and has been identified only through an archeological study performed in 1996 that partially mapped the chimney stack foundation. The existing chimney is located just east of the center of the House. The chimney is limestone random ashlar units, likely originally set in a clay mortar but later repointed with a cementitious mortar. The chimney appears to have been recently lime washed or painted in the caveau, and older paint or limewash was observed in the grenier (S-35).

The topmost section was removed and reconstructed with brick c. 1916. In 2007, the brick was removed, and the top was reconstructed in limestone to recreate the historic appearance (S-36).

Some minor areas of mortar loss or failing pointing mortar were observed in the grenier below the roofline. No evidence of displacement or distress of the masonry were observed.

Figure S-35. Chimney in the grenier, looking east.

Figure S-36. Reconstructed area of chimney above roofline, looking northeast.

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| **B** | **SHELL** | | |
| **B40** | **OTHER STRUCTURES** | | |
| | **B4010** | **CHIMNEYS** | |
| | | **B401002** | Brick Masonry Chimney |
| | | **Date:** | 1880s - c. 1900 |
| | | **Condition:** | Unknown |
| | | **Contributing:** | Contributing (but partially demolished) |
| | | **Repair Priority:** | Unknown |

## DESCRIPTION

When the west end wall was reconstructed, a brick masonry chimney approximately 1-foot 6-inches wide by 2-feet deep was added just inside the frame wall. Historic photos of the House c. 1900 and c. 1916 show the brick chimney penetrating the roofline.

The upper part of the chimney was deconstructed sometime after 2007 (S-37). The brick masonry chimney dates to within the period of significance but has been partially demolished. Future rehabilitation should consider the benefits of reconstructing the upper part of the chimney.

Figure S-37. Remnants of brick masonry chimney in grenier.

| B | SHELL | | |
|---|---|---|---|
| B10 | SUPERSTRUCTURE | | |
| | B1010 | FLOOR CONSTRUCTION | |
| | | B101002 | South Gallery |
| | | Date: | c. 1900 / c. 1963 |
| | | Condition: | Fair |
| | | Contributing: | Non-Contributing |
| | | Repair Priority: | Low |

## DESCRIPTION

The south gallery is an open porch extending the full length of the south wall (S-38). The deck of the gallery is approximately level with the interior finished floor. The south gallery was likely originally constructed somewhere around c. 1847, modified in 1900s, nearly completely reconstructed c. 1963, and repaired in 2007. The existing construction except the grenier stairs appears to date to c. 1963 or later.

In its current form, the south gallery is constructed of re-purposed dimension lumber from other structures. The joists are nominal 2x10s that are set into the pierrotage with a Portland-cement based mortar on one end and supported by a 2x10 rim joist on the other end. The main stairs appear to be recently constructed (S-39).

The gallery perimeter beam is supported by ten vertical posts, nominally 4-inches square. The posts are finished with a chamfer detail that somewhat matches the historic photographs of the north gallery posts. The number and placement of the posts and porch beams does not align with the original construction; the earliest photos of the House show nine posts on each side, which is consistent with the westernmost end of the House being shortened.

The railing is a single nominal 4x4, set into the posts with a mortise and tenon connection (S-40). The railing appears to have been designed to match the c. 1916 photo of the House that shows the north gallery in good detail. The railing is set approximately 30-inches above the walking surface. The gallery decking is constructed of nominal 1-inch boards of varying widths. The boards are nailed to the joists with reproduction nails.

Near the west end, there is visible deflection in the south gallery framing. This deflection was likely caused by the recent collapse of the adjacent well.

↑↑ Figure S-38. South gallery, looking west.

↑ Figure S-39. Modern stairs to south gallery.

→ Figure S-40. Gallery railing to vertical post detail.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B1015** | **STAIR CONSTRUCTION** | |
| | | **B101501** | Grenier Stairs |
| | | **Date:** | c. 1900 |
| | | **Condition:** | Poor |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | High |

## DESCRIPTION

The grenier stairs date to at least 1936, as they appear to be the same stairs shown in the earliest HABS photographs (S-41). The stairs are in poor condition.

Figure S-41. Grenier stairs at the south gallery, note the deterioration of the stringer and treads. The vertical posts are later modifications.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B1010** | **FLOOR CONSTRUCTION** | |
| | | **B101003** | North Gallery |
| | | **Date:** | c. 1963 |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The north gallery may also have been constructed around c. 1847 or slightly later as an open porch extending the full length of the north wall but was completely reconstructed and enclosed c. 1963 (S-42 and S-43).

In its current form, the north gallery is constructed of repurposed lumber, potentially from other structures or from features that were deconstructed at the House. At the underside of the gallery, vertically-sawn, circular-sawn, and hewn boards are visible.

The joists are nominal 2x10s that are set into the pierrotage with a Portland-cement based mortar on one end and supported by a 2x10 rim joist on the other end. Frame walls constructed of nominal 2x4 wood studs enclose the north gallery on three sides. Ten nominal 4x4 posts support the gallery; the bearing ends of several posts were heavily deteriorated.

Figure S-42. North gallery from the interior, looking east.

Figure S-43. East wall of the north gallery with enclosed walls and windows c. 1963.

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| **B** | **SHELL** | | |
| **B10** | **SUPERSTRUCTURE** | | |
| | **B2011** | **EXTERIOR WALL CONSTRUCTION** | |
| | | **B201101** | Original Door Header |
| | | **Date:** | c. 1792 |
| | | **Condition:** | Good |
| | | **Contributing:** | Contributing |
| | | **Repair Priority:** | N/A |

## DESCRIPTION

In the exposed poteaux-en-terre wall in the enclosed north gallery, an abandoned opening header can be seen just west of the existing hall door (S-44 and S-44). The opening has been infilled with hewn vertical logs which appear to have been salvaged, likely from the new opening or possibly even the missing west log wall. Chinking or plaster has been applied to the gaps between the logs; this plaster appears to be a modern repair.

The rough dimensions of this opening would have been approximately 4'-3", suggesting a double door. The height of the header shows the original entry was lower than the existing door openings and roughly aligned with the heads of the original window openings framed into the north wall. The opening would have been centered on the north wall, based on the house's original length, before the west wall and first truss bay were removed. It is likely the location of the original north door. Infrared thermographic scans of the south wall suggest that a similar header is concealed behind the exterior plaster, suggesting that the north and south walls had aligning central entries.

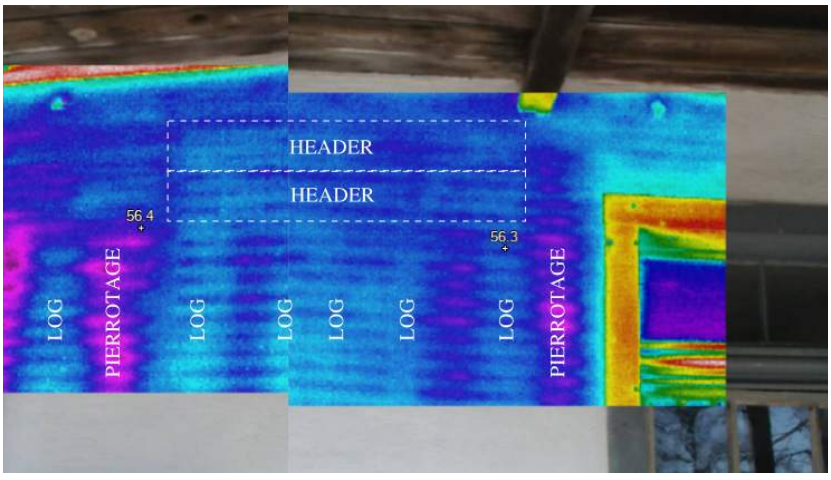



Figure S-46. Composite thermograph of the south wall, west of the existing center door, showing thermal anomalies consistent with a double header, suggesting an infilled opening. Note the thermal differences between the clay-set pierrotage and the fill used between logs below the header, suggesting these are different materials.

⇈ Figure S-44. Infilled double opening at north exterior wall.

↑ Figure S-45. Double header above infilled opening. Note the abandoned mortise pocket in the vertical log fourth from right.

# DESCRIPTION OF MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS

## FIRE PROTECTION

The existing Bauvais-Amoureux House currently has no type of commercial or residential fire suppression system. Any inclusion of a fire suppression system associated with the preservation or revitalization project for the property would require a new fire water main be extended to the House from St. Marys Road.

## HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

**General Conditions:**

The existing Bauvais-Amoureux House currently has no heating, ventilating, or air conditioning systems. The existing high roof and grenier characteristic of the House allows the interior heat to stratify in an upward direction thus keeping the living spaces below the grenier temperature.

Shade trees provide a means to block the summer sun to help keep the House interior temperature lower. The covered galleries allowed occupants to reside outside in the shade during the day and provided a cooler place to sleep at night. Opening windows on opposite sides of the building would allow for cross-ventilation providing a natural pathway to allow breezes to pass through the House, cooling the spaces as well.

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G30** | **SITE MECHANICAL UTILITIES** | | |
| | **G3010** | **WATER UTILITY** | |
| | | **G301001** | Water Service Entrance from St. Marys Road |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | N/A |

## DESCRIPTION

The water service serving the Bauvais-Amoureux House originates from a water main located along St. Marys Road. The water service extends to the west side of the road where it routes to a meter pit. The water service to this site along with other sites appear to have been recently replaced along with the water main at the street as have many of other properties that connect to the water main along St. Marys Road. This is evident by the numerous concrete replacement patches where property water services route from the individual locations back to the main location at the street *(Re: Photograph M-01)*.

Figure M-01: Existing street patching where utility piping has been replaced.

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G30** | **SITE MECHANICAL UTILITIES** | | |
| | **G3010** | **WATER UTILITY** | |
| | | **G301002** | Water Service to House from Meter Pit |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | N/A |

## DESCRIPTION

The water service serving the Bauvais-Amoureux House is limited to a 3/4" rigid copper water service from the water utility main located at St. Marys Road to the east of the House.

The water service enters the site where it passes through a water meter pit located at the east end of the site *(Re: Photograph M-02 identified with the blue painted circle and photograph M-03)*. The water service routes from an underground meter pit location to the northwest corner of the House where it then routes out of the ground under the north enclosed gallery.

Figure M-02: Existing water service meter pit location indicated by blue paint.

Figure M-03: Existing water utility meter pit location.

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G30** | **SITE MECHANICAL UTILITIES** | | |
| | **G3010** | **WATER UTILITY** | |
| | | **G301003** | Water Service Entrance to House |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | High |

## DESCRIPTION

The water piping breaches the ground below the north gallery where the exposed piping is insulated with 1/2" thick closed-cell elastomeric insulation *(Re: Photograph M-04)*. Although the water service main has pipe insulation, this insulation would not provide protection against freezing conditions. Water has to be isolated at the underground meter pit to winterize the House currently.

Figure M-04: Existing water utility piping and sanitary service main exiting the ground under the north gallery.

| G | BUILDING SITE WORK | | |
|---|---|---|---|
| G30 | SITE MECHANICAL UTILITIES | | |
| | G3010 | WATER UTILITY | |
| | | G301004 | Water Service Entrance to House |
| | | Date: | 1960s and later |
| | | Condition: | Good to Fair |
| | | Contributing: | Non-Contributing |
| | | Repair Priority: | High |

## DESCRIPTION

From the side of the 3/4" water main, a 1/2" branch line routes to the west where it terminates at a sill cock at the west end of the gallery *(Re: Photographs M-05 and M-06)*. Immediately ahead of the sill cock, there is approximately 6-8 inches of copper pipe which is not insulated *(Re: Photograph M-07)*.

↑↑ Figure M-05: Existing water and vent piping under north gallery.

↑ Figure M-06: Existing water and vent piping under north gallery.

← Figure M-07: Existing water piping to sill cock and vent piping under north gallery.

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G30** | **SITE MECHANICAL UTILITIES** | | |
| | **G3020** | **SANITARY SEWER** | |
| | | **G302001** | Sanitary Utility Serving House |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The Bauvais-Amoureux House is served by a single 4" cast iron hub and spigot, sanitary waste service which extends from St. Marys Road located east of the House. The sanitary main extends to the west from the street along the north side of the House outside the footprint of the north gallery. Here the sanitary main offsets to the south to a location under the northwest corner of the north gallery. Once under the gallery, it offsets up out of the ground.

There is a hub with a vented cap located just to the north of the gallery which protrudes out of the ground approximately 12-inches *(Re: Photograph M-08)*.

It is assumed that this hub is used as a cleanout location where the sanitary sewer offsets to the east from the House to St. Marys Road.

Figure M-08: Existing hub from underground sanitary sewer main north of north gallery.

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G30** | **SITE MECHANICAL UTILITIES** | | |
| | **G3020** | **SANITARY SEWER** | |
| | | **G302002** | Sanitary Utility Serving House |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

At the location where the 4" sanitary utility offsets out of the ground under the northwest end of the north gallery, it extends up through the gallery floor to a restroom.

Approximately 6-8 inches above the ground there is a cleanout plug in the sanitary pipe *(Re: Photograph M-09)*.

Above the cleanout location, a 1-1/2" copper drain waste and vent (DWV) pipe is connected to the vertical main which serves the lavatory at the restroom above the gallery *(Re: Photograph M-10)*.

Figure M-09: Existing sanitary sewer main at ground below north gallery.

Figure M-10: Existing sanitary piping below north gallery.

| | | | |
|---|---|---|---|
| **G** | **BUILDING SITE WORK** | | |
| **G30** | **SITE MECHANICAL UTILITIES** | | |
| | **G3020** | **SANITARY SEWER** | |
| | | **G302003** | Sanitary Utility Serving House |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Good to Fair |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The 4" sanitary line continues up through the gallery floor where it serves the water closet located above. Ahead of the connection of the lavatory waste to the 4" sanitary main, is another 1-1/2" copper sanitary pipe which offsets up and routes to the west exterior wall from below the gallery structure where it then offsets up and terminates with an open end approximately 10-feet above grade *(Re: Photographs M-12, M-13 and M-14)*. This pipe acts as the vent for the lavatory and water closet located at the restroom above the gallery floor.

↑↑ Figure M-12: Existing copper vent line below north gallery.

↑ Figure M-13: Existing sanitary piping below north gallery.

← Figure M-14: Existing vent piping routing up west side of structure.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D20** | **PLUMBING** | | |
| | **M1030** | **PLUMBING FIXTURES** | |
| | | **M103001** | Plumbing Fixtures in House |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Fair |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

At the location where the 4" sanitary utility offsets out of the ground From the underside of the gallery, the 3/4" copper water line extends up through the gallery floor where it serves the two plumbing fixtures of the restroom.

In this restroom are a single, floor-set, flush tank water closet and a wall-mounted lavatory *(Re: Photograph M-15)*.

The Bauvais-Amoureux House does not have any plumbing fixtures other than the lavatory and water closet located at this restroom. Both of these fixtures are of vitreous china construction and appear in fair shape. This single water service penetrates the floor structure where it branches off to serve both fixtures. Single isolation valves are provided for each fixture *(Re: Photograph M-16)*. The lavatory is served by cold water only.

Figure M-15: Existing lavatory and water closet at restroom of Main Floor.

Figure M-16: Existing isolation valves for plumbing fixtures located below existing lavatory.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D20** | **PLUMBING** | | |
| | **D2090** | **OTHER PLUMBING SYSTEMS** | |
| | | **D209001** | Sump Pump at House Caveau |
| | | **Date:** | c. 2004 |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

Located at the caveau level of the House is a sump pump which is believed to have been added after the 1993 flood. The pump is located in a floor depression just inside the caveau door from outside. The pump discharge piping exits the caveau through the east foundation wall where it terminates on site *(Re: Photograph M-17)*. The capacity of the sump pump is unknown as it was not removed from the sump to evaluate its condition.

Figure M-17: Existing covered sump pit and pump at caveau level.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D20** | **PLUMBING** | | |
| | **D2090** | **OTHER PLUMBING SYSTEMS** | |
| | | **D209002** | Abandoned Well and Hand Pump |
| | | **Date:** | Undetermined |
| | | **Condition:** | Poor |
| | | **Contributing:** | Not Assessed |
| | | **Repair Priority:** | Low |

## DESCRIPTION

At the southwest corner of the site is an old hand-pump. It is assumed that this hand-pump is associated with an underground well. The hand-pump's handle has been disconnected indicating that it and the well have been abandoned *(Re: Photograph M-18)*.

It is unclear if this hand-pump and associated well served the Bauvais-Amoureux House based on its location in reference with the House. Reference the location of the hand-pump location and the Bauvais-Amoureux House in the background *(Re: Photograph M-19)*.

Figure M-18: Existing abandoned well at southwest corner of the site (looking towards the south).

Figure M-19: Existing abandoned well at southwest corner of the site (looking towards the east).

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D20** | **PLUMBING** | | |
| | **D2090** | **OTHER PLUMBING SYSTEMS** | |
| | | **D209003** | Cistern |
| | | **Date:** | Undetermined |
| | | **Condition:** | Poor |
| | | **Contributing:** | Not Assessed |
| | | **Repair Priority:** | Low |

## DESCRIPTION

Historical photos of the time period around 1936 indicate that near the southwest corner of the south gallery was an underground cistern with an aboveground hand-pump. This cistern would have been connected to a cast iron pipe which extended to above ground where it would have been connected to the gutter downspout near the southwest corner of the gallery. This gutter and downspout would have been used to collect stormwater off of the roof and stored in the cistern. The hand-pump would have been used to bring the water to the surface where it could be pumped into buckets or other collection devices similar to a water-well. The collection pipe from the downspout and the cistern along with the hand pump has since been removed and the old cistern abandoned in place. The round concrete lid over the cistern remains in place today (Re: Photograph M-20). Storm water off of the south side of the roof currently is collected by the downspout at the west end where it discharges into a 4" or 6" diameter, white, polyvinyl chloride (PVC) drain line (Re: Photograph M-21) located just below the surface of the ground. The PVC drain offsets down below the surface of the ground where it then routes to the northwest corner of the site. There it daylights with an open end. The PVC drain at the northwest is fragmented and broken in several locations and appears plugged with debris (Re: Photographs M-22).

↑↑ Figure M-20: Existing cistern location.

↑ Figure M-21: Existing southeast downspout.

→ Figure M-22: Existing downspout daylighting out of ground at north end of site.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D20** | **PLUMBING** | | |
| | **D3012** | **GAS SUPPLY SYSTEM** | |
| | | **D301201** | Gas Utility Serving Site |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

A 2007 facility exterior revitalization project removed and replaced the exterior siding and roofing materials. This work also included removing an old natural old natural gas-fed water heater, the flue through the roof, and some existing natural gas piping at the west exterior of the structure to facilitate the siding replacement.

As the lavatory would have been the only plumbing fixture served by the gas-fired hot water, with the removal of the water heater the House was left with cold water only.

The existing gas utility piping from St. Marys Road runs underground along the north side of the House outside the footprint of the north gallery *(Re: Photograph M-23 as identified by the yellow utility locator paint and flags).* The gas line is stubbed up through the ground where a valve and capped end is present just west of the building *(Re: Photograph M-24).*

Figure M-23: Existing gas utility location depicted by yellow flags.

Figure M-24: Existing gas utility capped west of building.

| | | | |
|---|---|---|---|
| **B** | **SHELL** | | |
| **B20** | **EXTERIOR ENCLOSURE** | | |
| | **B2030** | **EXTERIOR DOORS** | |
| | | **B203001** | Gaps at Entry Door |
| | | **Date:** | Undetermined |
| | | **Condition:** | Fair |
| | | **Contributing:** | Not Assessed |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

At the south main entry door off of the gallery, daylight is present under the door with a gap estimated at between 3/8" to 1/2". This size of gap allows a significant amount of air infiltration and insect intrusion at the door due to the absence of an adequate door threshold below the door *(Re: Photograph M-25)*.

Weather-stripping is also lacking at the door's jambs and head *(Re: Photograph M-26)*.

Figure M-25: Existing gap below entry door from south gallery.

Figure M-26: Existing entry door from south gallery.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D30** | **HEATING, VENTILATING AND AIR CONDITIONING (HVAC)** | | |
| | **D3041** | **HVAC EQUIPMENT** | |
| | | **D304101** | HVAC Equipment Removed |
| | | **Date:** | 1960s and later |
| | | **Condition:** | N/A |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | N/A |

## DESCRIPTION

Photos of the grenier interior taken in 1980 indicate that a central HVAC unit served the Bauvais-Amoureux House. This system would not have been original to the House and was likely added well after the House would have been used as a residence. This HVAC system provided air circulation to the main four rooms in the House and to the north enclosed gallery *(Re: Photograph M-27 and M-28).*

In 2005, the air conditioning unit was deemed unrepairable and was ultimately removed along with the ductwork and grenier insulation as part of a hazardous material cleanup in the grenier space. The clean-up of the grenier was deemed necessary due to the deterioration of the roof which allowed access by birds and other rodents and which had deposited their feces on the ductwork, air conditioning unit, and insulation.

The HVAC unit and ductwork removed in 2005 was never replaced and the House exists today without any type of heating or air conditioning system or air duct distribution.

↑ Figure M-27: 1980 photo of old HVAC unit and associated ductwork located at the grenier space.

→ Figure M-28: 1980 photo of old ductwork located at the grenier space.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D50** | **ELECTRICAL SYSTEMS** | | |
| | **D5020** | **POWER DISTRIBUTION AND CONTROL DEVICES** | |
| | | **D502002** | Abandoned Ceiling Outlets |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Fair |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The air distribution ductwork which was located at the grenier and removed in 2005 ran the east/west length of the north gallery up in the grenier. The ductwork was insulated with flexible fiberglass insulation. The ductwork branched out within the grenier to multiple round ceiling supply air outlet grilles.

The ductwork was removed but the ceiling supply air grilles remain today left abandoned in place *(Re: Photographs M-29, M-30 and M-31 for ceiling diffusers).*

↑↑ Figure M-29: Existing vintage HVAC outlets at ceiling.

↑ Figure M-30: Existing vintage HVAC outlets at ceiling.

← Figure M-31: Existing vintage HVAC outlets at ceiling.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D30** | **DISTRIBUTION SYSTEMS** | | |
| | **D3041** | **HVAC EQUIPMENT** | |
| | | **D304102** | HVAC Equipment Removed |
| | | **Date:** | 1960s and later |
| | | **Condition:** | Fair |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

Along with the ceiling supply air outlet grilles being abandoned in place, the HVAC system's main return air grille located at the center hallway was also abandoned in place *(Re: Photographs M-32 and M-33).*

After the grenier cleanup, wood planks were laid across the First level ceiling joists allowing access across the grenier space which remain to this day.

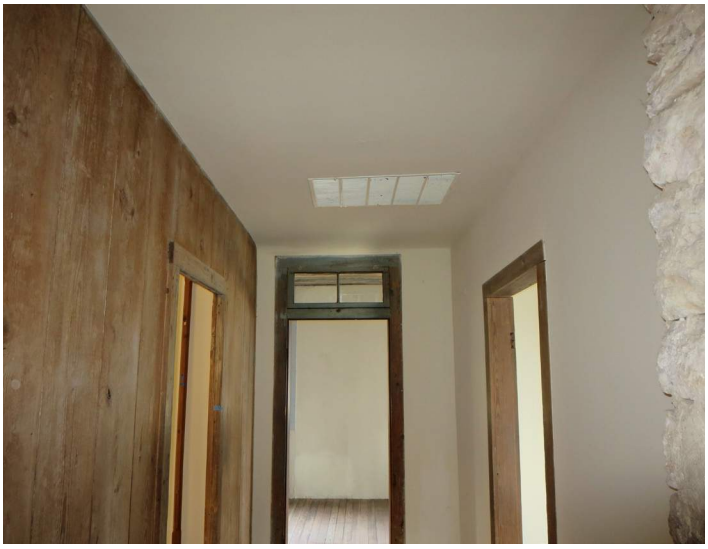


Figure M-32: Existing ceiling return air grille at center hallway.

Figure M-33: Existing ceiling return air grille at center hallway.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D30** | **DISTRIBUTION SYSTEMS** | | |
| | **D3041** | **HVAC EQUIPMENT** | |
| | | **D304103** | Portable HVAC A/C Units |
| | | **Date:** | c. 2018 |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | N/A |

## DESCRIPTION

Portable electric plug-in air conditioning units have been used to provide temporary air conditioning whenever the House has been open for tours or special events. These portable units are stored in the restroom space located at the west end of the north enclosed gallery *(Re: Photograph M-34)*

Access to the grenier can only be made currently utilizing a steep exterior stairway located at the west end of the south gallery *(Re: Photograph M-35- stairway is located at the left side of the photo).*

Should any kind of HVAC system be planned for this House, access will be an issue if located in the unconditioned and unheated grenier so it is recommended that any added HVAC system be located somewhere on the Main Level of the House for access and maintenance purposes should HVAC be considered.

Figure M-34: Existing portable HVAC units stored in restroom.

Figure M-35: Existing south gallery showing existing exterior staircase to grenier level.

| G | BUILDING SITE WORK | | |
|---|---|---|---|
| G40 | SITE ELECTRICAL UTILITIES | | |
| | G4010 | ELECTRICAL DISTRIBUTION | |
| | | G401001 | Outdoor Electrical Service to House |
| | | Date: | 1960s and later |
| | | Condition: | Good |
| | | Contributing: | Non-Contributing |
| | | Repair Priority: | Low |

## DESCRIPTION

The electrical utility company serving the building is Citizens Electric Corporation. Primary power is routed overhead along Saint Marys Road to an oil-filled, pole-mounted transformer bank with three transformers. This transformer bank is approximately 170 feet away to the north from the Bauvais-Amoureux House. From the transformer bank, a 240/120-volt, single-phase, 3-wire service feeder is routed overhead across Saint Marys Road to a wooden pole and then south to a wooden pole along Saint Marys Road to a wooden pole in front of the Bauvais-Amoureux House. *(Re: Photograph E-01)* At this pole, the service feeder is routed down the pole in 2" polyvinyl chloride (PVC) conduit to a 200-amp meter socket with a 200-amp, 2-pole and 60-amp, 2-pole service disconnect breakers. *(Re: Photograph E-02)* The breakers are manufactured by Square "D" and have a 10,000-amp interrupting current (A.I.C.) rating.

↑ Figure E-01: Existing Utility Power Pole with Electric Meter, Fiber Optic Termination Box, and Overhead Utility Lines.

→ Figure E-02: Existing Communication Utility Company Demarcation Box Under the Porch.

| G | BUILDING SITE WORK | | |
|---|---|---|---|
| G40 | SITE ELECTRICAL UTILITIES | | |
| | G4010 | ELECTRICAL DISTRIBUTION | |
| | | G401001 | Electrical Meter Socket Grounding at Pole |
| | | Date: | c. 2011 |
| | | Condition: | Good |
| | | Contributing: | Non-Contributing |
| | | Repair Priority: | Low |

## DESCRIPTION

From the 200-amp meter socket, a bare #6 American Wire Gauge (A.W.G), copper grounding conductor is routed and stapled to the wooden power pole and then routed down to a driven ground rod.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D50** | **ELECTRICAL** | | |
| | **D5010** | **ELECTRICAL POWER DISTRIBUTION** | |
| | | **D501001** | Electrical Panel in House |
| | | **Date:** | c. 2011 |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

From the bottom of the 200-amp meter socket, the 240/120-volt, single-phase, 3-wire, plus ground feeder is routed underground to a 200-amp load center in the Bauvais-Amoureux House. The underground feeder is transitioned underground with a 45-degree elbow up to above grade, then another 45-degree elbow up to an expansion fitting, and then up to the 200-amp load center. The feeder below the load center is in unsupported PVC conduit.

The 240/120-volt, 200-amp load center is manufactured by Square "D"; has a main 200-amp, 2-pole breaker; one, 60-amp, 2-pole; seven, 20-amp, 1-pole; and one, 15-amp, 1-pole branch breakers. The branch breakers are manufactured by Square "D" type home line with a 10,000 A.I.C. rating. There are 12 blank spaces for future breakers. *(Re: Photographs E-03 and E-04)* The current electrical service was installed in 2011. *(Re: EA-01 and EA-02)*

Figure E-03: Existing 240/120-Volt, Single-Phase, 3-Wire, 200-Amp Load Center on West End of North Gallery.

Figure E-04: Existing 240/120-Volt, 200-Amp, Load Center with Door Open Showing Circuit Breakers (JMK 11/24/20).

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D50** | **ELECTRICAL** | | |
| | **D5010** | **ELECTRICAL POWER DISTRIBUTION** | |
| | | **D501002** | Circuit Directory on Panel |
| | | **Date:** | c. 2011 |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

The circuit directory for the load center indicates that the branch breakers serve the following loads:

1. 20-amp, 1-pole – Lights, receptacles in office room
2. 20-amp, 1-pole – Receptacles display case room
3. 20-amp, 1-pole - Lights on porch
4. 20-amp, 1-pole - Lights under the house
5. 20-amp, 1-pole – Lights in middle room
6. 20-amp, 1-pole – Outside receptacles, porch receptacle
7. 20-amp, 1-pole - Panel receptacle
8. 15-amp, 1-pole – Spare

10/11. 50-amp, 2-pole – 50 receptacles on panel *(Re: Photograph E-05).*

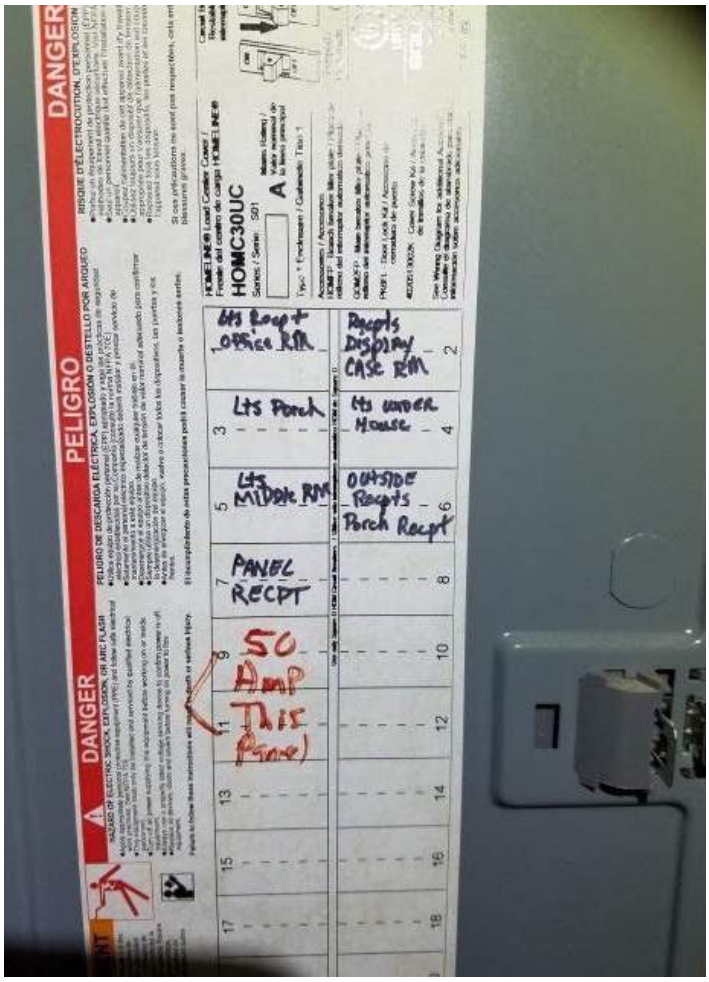



Figure E-05: Existing 240-120-Volt, 200-Amp, Load Center with Door Open Showing Circuit Directory.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D50** | **ELECTRICAL** | | |
| | **D5010** | **ELECTRICAL POWER DISTRIBUTION** | |
| | | **D501003** | Ground Rod Connection |
| | | **Date:** | c. 2011 |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

A #6 A.W.G. bare copper grounding conductor is routed out of the bottom of the load center in a 2" lock PVC conduit shared with three metal clad (MC) interior wiring cables. The 2" conduit penetrates the first floor and stops. The #6 grounding conductor is then stapled to the wood structure and is routed down to a driven ground rod. *(Re: Photograph E-06)*

Figure E-06: Existing Bore #6 Copper Grounding Electrode Wire Exiting 2" PVC Conduit from Load Center Above to Driven Ground Rod.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D50** | **ELECTRICAL** | | |
| | **D5010** | **ELECTRICAL POWER DISTRIBUTION** | |
| | | **D501004** | Branch Circuits - MC Cable, Romex, Flexible Conduit |
| | | **Date:** | c. 2011 |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Moderate |

## DESCRIPTION

Branch circuits are routed from the load center to receptacles and lighting fixtures using MC cable. MC cables are routed in 2" PVC up to the attic area where then the MC cable is then routed exposed over to serve lighting fixtures and receptacles. Also, three MC cables are routed in 2" PVC down to below the porch where then the MC cable is routed exposed over to serve lighting fixtures and receptacles. *(Re: Photograph E-07)*

The MC cable has two #12 A.W.G. phase and neutral conductor, along with one #12 A.W.G. equipment grounding conductor. The MC cable was installed in 2011.

There are also some wiring using non-metallic, sheathed cable (Romex) and conductors in flexible metal conduit which was installed prior to 2011. *(Re: Photographs E-08 and E-09)*

Figure E-07: Existing Metal Clad (MC) cable Exiting a 2" PVC Conduit from the Load Center Above.

Figure E-08: Existing Non-Metallic Sheathed Cable Installed Before 2011.

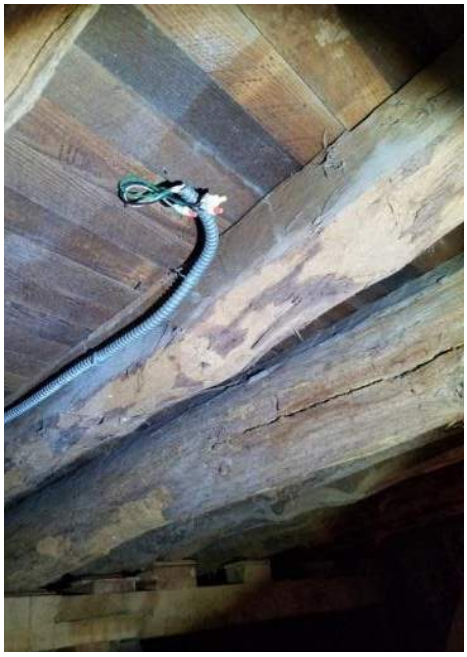


Figure E-09: Existing Abandoned Wiring Conductors in Flexible Metal Conduit.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D50** | **ELECTRICAL** | | |
| | **D5022** | **LIGHTING** | |
| | | **D502201** | Lighting Fixture Types |
| | | **Date:** | Undetermined |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The exterior of the building has no lighting fixtures. The caveau has two surface-mounted lighting fixtures attached to the ceiling. Northeast room on the first floor has one incandescent lamp holder mounted on the ceiling with parabolic aluminized reflector (PAR) lamp. Southeast room on the first floor has one incandescent lamp holder with a PAR lamp. *(Re: Photograph E-10)* Northwest room on the first floor has four fluorescent, 4', 2-lamp industrial lights with reflectors. The lighting fixtures are surface-mounted to the ceiling. There is fabric hung underneath the lighting fixtures in this room to reduce glare and lighting levels. *(Re: Photograph E-11)* Southwest room on the first floor has one incandescent lamp holder with a PAR lamp.

← Figure E-10: Existing Incandescent Lighting with PAR Lamps in East Room on First Floor.

↑ Figure E-11: Existing Fluorescent Lighting Fixture with Cloth Covering in the Northwest Room on First Floor.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D50** | **ELECTRICAL** | | |
| | **D5020** | **POWER DISTRIBUTION AND CONTROL DEVICES** | |
| | | **D502001** | Receptacles and Switches |
| | | **Date:** | Undetermined |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

Under the North Gallery, at the west end, there are two ground-fault circuit interrupter (GFCI) receptacles mounted in a surface box with a weatherproof, in-use, plastic cover.

In the lower Caveau, near the entrance door on the east side, there are two toggle switches mounted in a surface-mounted metal box with a double-gang metal coverplate. In the lower level, at the east end, there are two GFCI receptacles mounted in a surface-mounted, metal box with a double-gang, plastic ivory coverplate.

In the southwest room, on the first floor near the entrance door, there is a brown toggle switch to control lighting. The toggle switch is mounted in a buff-colored, surface box with buff-colored, surface raceway up to the ceiling. *(Re: Photograph E-12)* There is a 120-volt, duplex receptacle on the north wall and the south wall. *(Re: Photograph E-13)*

In the southeast room, on the first floor on the south wall, there is a toggle switch mounted flush in the wall with a plastic, ivory faceplate to control display lighting. There is a 120-volt, duplex receptacle on the east wall and the south wall.

In the northeast room, on the first floor, there are two, 120-volt, duplex receptacles on the north wall.

In the northwest room, on the first floor, there is a 120-volt, duplex receptacle on the south wall. Also, in the northwest room, on the ceiling, south wall, and north wall, there are electrical junction boxes.

On the north gallery, there are two toggle switches to control lighting. At the west end, there is a 240-volt, 50-amp receptacle and a 120-volt, duplex receptacle.

Figure E-12: Existing Toggle Switch Mounted in Surface Metal Raceway in Northwest Room on First Floor.

Figure E-13: Existing Receptacle in Metal Box Being Powered with Metal Clad (MC) Cable in the East Room on First Floor.

| | | | |
|---|---|---|---|
| **D** | **SERVICES** | | |
| **D50** | **ELECTRICAL** | | |
| | **D5030** | **COMMUNICATIONS AND SECURITY** | |
| | | **D503001** | Fiber Optic Service to House |
| | | **Date:** | Undetermined |
| | | **Condition:** | Good |
| | | **Contributing:** | Non-Contributing |
| | | **Repair Priority:** | Low |

## DESCRIPTION

The local utility communications company has routed an underground fiber optic cable up to a termination box mounted on the same power pole as the electrical meter. From the pole-mounted termination box, the fiber optic cable was routed underground in PVC conduit over to another demarcation termination box mounted under the North Gallery. *(Re: Photograph E-14)* From the demarcation box, there is one copper communication cable routed over to a work area on first floor. There is also a coiled-up copper communications cable not being used. *(Re: Photograph E-15)*

Figure E-14: Existing Fiber Optic Service to Demarcation Box Under the Porch.

Figure E-15: Existing Communication Utility Company Demarcation Box Under the Porch.

| D | SERVICES | | |
|---|---|---|---|
| D50 | ELECTRICAL | | |
| | D5022 | LIGHTING | |
| | | D502202 | Exit Lighting and Emergency Lighting |
| | | Date: | N/A |
| | | Condition: | N/A |
| | | Contributing: | N/A |
| | | Repair Priority: | High |

## DESCRIPTION

The building does not have exit lighting or emergency lighting.

| D | SERVICES | | |
|---|---|---|---|
| D50 | ELECTRICAL | | |
| | D5037 | FIRE ALARM SYSTEMS | |
| | | D503701 | Fire Alarm System |
| | | Date: | N/A |
| | | Condition: | N/A |
| | | Contributing: | N/A |
| | | Repair Priority: | High |

## DESCRIPTION

The building does not have a fire alarm system.

| D | SERVICES | | |
|---|---|---|---|
| D50 | ELECTRICAL | | |
| | D5038 | SECURITY AND DETECTION SYSTEMS | |
| | | D503801 | Intrusion Alarm Systems |
| | | Date: | N/A |
| | | Condition: | N/A |
| | | Contributing: | N/A |
| | | Repair Priority: | High |

## DESCRIPTION

The building does not have an intrusion alarm system.

| D | SERVICES | | |
|---|---|---|---|
| D50 | ELECTRICAL | | |
| | D5090 | LIGHTNING HAZARD REDUCTION | |
| | | D509001 | Lightning Protection System |
| | | Date: | N/A |
| | | Condition: | N/A |
| | | Contributing: | N/A |
| | | Repair Priority: | N/A |

## DESCRIPTION

The building does not have a lightning protection system.

# Description of Safety (Summary)

## LIMITED PHASE 2 ENVIRONMENTAL ASSESSMENT

A limited Phase 2 Environmental Assessment was performed to determine the presence or absence of asbestos-containing materials (ACM) and lead-based paint (LBP). No analysis of soil or groundwater was performed. Bulk samples for ACM identification were taken for laboratory analysis by Polarized Light Microscopy; sampling was performed where materials were already damaged. Testing for LBP was performed non-destructively in situ using direct readings from an X-Ray Fluorescence (XRF) spectrum analyzer. A survey was also performed to identify other potentially hazardous materials, including fluorescent light fixtures, ballast, and chemicals.

Non-friable ACM was positively identified in concentrations greater than 1% in the interior drywall and joint compound located at the c. 1963 exterior walls of the north gallery. Positive ACM results lower than 1% concentrations were also identified in some of the grenier insulation and the window glazing putty.

Over 200 sample locations were tested using XRF and multiple locations were positively identified as containing LBP. Based on this survey, LBP should be assumed to be present at all windows and window trim (potentially excluding the attic windows), all surface finishes in the office room at the southwest corner, and at all doors, door frames, and trim.

For other hazardous materials, several packages of maintenance products were identified in the caveau, including paint thinner and repair compounds. Fluorescent light ballasts and bulbs were also identified on the first floor.

Further information on the limited Phase 2 Environmental Assessment is provided in the *Hazardous Materials Survey of Beauvais Amoureux House* report, included as Appendix G.

# Part 2: Treatment & Use

## Requirements for Treatment and Use

### LAWS, REGULATIONS, AND FUNCTIONAL REQUIREMENTS

Key laws, regulations, and functional requirements that apply to the recommended work include the following:

- National Park Service Cultural Resources Management Guideline (Director's Order 28), which requires planning for the protection of cultural resources on park property.
- Section 106 of the National Historic Preservation Act (NHPA), which mandates that federal agencies, including the NPS, take into account the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment.

Treatment of the building and site are also to be guided by the following:

- Secretary of Interior's Standards for the Treatment of Historic Properties
- NPS Management Policies 2006
- Uniform Federal Accessibility Standards
- All current applicable Building Codes

The NPS is self-regulating in terms of enacting and enforcing building code standards. The Bauvais-Amoureux House is therefore not legally subject to local or state building code requirements. When undertaking repairs to buildings structures, NPS endeavors to have the work comply with model building code standards.

With historic structures, attempts to achieve strict conformance with model building code standards that are intended for new buildings can lead to destruction of the historic fabric. Alternative compliance procedures, such as Chapter 12 of the IEBC relating to historic buildings, should be referenced in determining code compliance.

### PRESERVATION OBJECTIVES

The recommendations provided in this report have been developed in accordance with the Secretary of the Interior's Standards.

The NPS has identified four treatments for historic properties[1], and there are separate standards for each of these treatments: preservation, rehabilitation, restoration, and reconstruction. The four treatments are defined as follows:

#### PRESERVATION

The act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

#### REHABILITATION

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.

#### RESTORATION

The act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

1 Revised by Anne E. Grimmer, The Secretary Of The Interior's Standards For The Treatment Of Historic Properties With Guidelines For Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings (Washington, D.C.: U.S. Department of the Interior, National Park Service Technical Preservation Services, 2017)

**RECONSTRUCTION**

The act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

The selection of a treatment depends on a number of factors, including the relative importance of the property in history, the physical condition of the property, the proposed use, and code requirements.

Based on the conversations with the NPS, the chosen treatment for the Bauvais-Amoureux House is Rehabilitation.

## TREATMENT OPTIONS

| Component | Integrity | Contributing | Treatment Options |
|---|---|---|---|
| **Exterior** | Low (modern replacement options) | Contributing & Non-Contributing | Rehabilitation |
| **Structure** | High (but poor condition) | Contributing | Rehabilitation |
| **Interior** | Moderate (many levels of alterations) | Contributing & Non-Contributing | Rehabilitation |
| **Landscape** | Low (significant alterations and loss of historic features) | Contributing & Non-Contributing, & TBD | Rehabilitation |
| **Building Systems** | N/A | Non-Contributing | Rehabilitation |

## CODE ANALYSIS

The NPS has adopted the following Building Codes and Industry Standards which were used for the analysis of this report:

- IBC 2021 with Appendices
- IEBC 2021 with Appendices
- NFPA 101 Life Safety Code
- ABAAS

The building is currently unoccupied and has been previously used as a residence. The NPS would like to use the House as a key element of the newly created Ste. Genevieve National Historical Park. This occupancy would align with the occupancy definition of Group B in the 2021 IBC and per IEBC Special Occupancy exceptions for Museums (historic buildings). The recommendation is to allow the first floor to be assigned the B occupancy with the basement and attic remaining unoccupied.

### CODE ISSUES – DISABLED ACCESSIBILITY – UNIFORM FEDERAL ACCESSIBILITY STANDARDS

In the NPS Management Policies 2006, Chapter 5 Cultural Resource Management, it states in section 5.3.2 Physical Access for Persons with Disabilities that,

> "The National Park Service will provide persons with disabilities the highest feasible level of physical access to historic properties that is reasonable, consistent with the preservation of each property's significant historical features. Access modifications for persons with disabilities will be designed and installed to least affect the features of a property that contribute to its significance. Modifications to some features may be acceptable in providing access once a review of options for the highest level of access has been completed. However, if it is determined that modification of particular features would impair a property's integrity and character in terms of the Advisory Council's regulations at 36 CFR 800.9, such modifications will not be made. To the extent possible, modifications for access will benefit the greatest number of visitors, staff, and the public, and be integrated with or close to the primary path of travel for entrances and from parking areas. In situations where access modifications cannot be made, alternative methods of achieving program access will be adopted."

The NPS is committed to providing persons with disabilities the highest feasible level of physical access to historic properties that is reasonable as noted above. However, if it is determined that the modification of particular features would impair a property's integrity and character, such modifications should not be made. The Bauvais-Amoureux House should be made accessible from the public right of way, onto the site, and into the main first floor of the building. Access to the basement and the attic is impractical from within the historic structure. Access to these spaces would significantly impact preserving the building's architectural integrity.

Access to the basement level should be limited. Providing access into this space by widening the east doorway would impact the c. 1792 construction intact at this location. Access could be accomplished by providing an accessible route to the existing door opening at the east and to provide a means to visually see into the space without actually entering it. Further development of interpretive information about this space and its french construction methodologies could be provided in an adjacent space or alternate building, as part of the future interpretive planning study.

The architectural design preferred option included in this report shows how to accommodate accessibility and code stairway access and upgrades to the first floor level. First floor accessibility could be achieved through the implementation of a new ramp and stairway at the west facade. Once inside the building many of the door widths and thresholds would need to be modified to accommodate wheelchair access. The doorways should be chosen based on areas to be accessed and by their original construction dates, as some walls and doors date to c. 1852 and others to c. 1792.

The following specific accessibility code deficiencies have been identified:

**Basement Level:**

- The basement level is not required to be accessible since it will not likely contain occupied program spaces.

**First Level:**

- Doorways are typically too narrow for UFAS accessibility. Minimum clear passage width is 32 inches, the majority of the doors are 31 inches wide.
- Many of the doorways have inaccessible thresholds. Maximum vertical level changes are limited to 1/4 inches and sloping offsets are limited to 1/2 inch.
- The building has no accessible restrooms, drinking fountains, or mop sinks which would be required for public occupancy. These elements can be accommodated

in a nearby building within the historical park.

- There is no accessible compliant signage throughout the site or building which should be provided to define the accessible route both on the site and through the building.
- The flooring in the main east room (Room103) currently exceeds the maximum slope and cross-slope requirements for walking surfaces as identified by UFAS and the Denver Service Center. Resetting and leveling the flooring should be coordinated with the structural repairs to the floor framing system.

**Second Level:**

- The exterior stair treads, and risers at the main stair do not meet minimum accessibility codes. The existing stair risers are 9 inches high and the treads are 6 3/4 inches. Treads should be a minimum of 11 inches deep and treads and risers need to be uniform. Railings need to be within required heights and shape criteria and have proper end extensions, these requirements are not met by the current staircase. The second floor is not required to be accessible since it will not likely contain occupied program spaces. Any modifications to this exterior stair would impact the historic character of the building and are therefore not recommended.

## CODE ISSUES - BUILDING CODE AND LIFE SAFETY

The following specific building code and life safety deficiencies based on the 2021 International Building Code and NFPA 101 have been identified.

**General Building:**

- Existing construction type deficiencies will need to be addressed by the sensitive installation of an automatic fire sprinkler system.
- The building lacks code compliant exit signage throughout the building which should be provided prior to any occupancy.

**Basement Level:**

- The basement level does not meet minimum headroom clearances. This can be an issue if there are expectations that there will be mechanical and/or electrical equipment that requires specific exiting requirements. These spaces are not recommended to be within the basement. General ceiling heights in occupied space should be 7 feet minimum, current head height is approximately 6 feet 6 inches. In its current condition the basement is not occupiable.
- The door accessing the basement is too narrow for UFAS accessibility.

**First Level:**

- The front porch perimeter lacks a safety railing. The IBC requires a guardrail at changes in level greater than 30 inches along walking surfaces.
- The steps at the front porch do not have adequate and consistent treads and risers and do not have code compliant handrails.
- Doorways are typically too narrow for IBC exit path requirements. Minimum clear passage width is 32 inches and existing widths are typically 31 inches.
- Some of the doors may swing in the wrong direction for emergency exiting depending on the final identified occupant load and identified exit paths. Doors should swing in the direction of egress when the occupant load is more than 50. The most practical solution to this deficiency is to limit the interior occupant load to less than 50.
- The existing floor structure and shoring are insufficient to support the live loads required for Assembly-rated occupancies, which are typically 100 psf for general assembly and corridor spaces. Coordination with the structural improvements will be required.

**Second Level:**

- The main exterior stair does not meet configuration requirements for an emergency exit stair. The risers and treads are inconsistent and not properly sized. The width of the stair is less than the required 36 inches. The most practical solution to this deficiency is to limit the occupancy to private usage and classify it as a business area utilizing the occupant load factor 150 to allow for 6 occupants. The preferred solution is to not allow any occupants to the second floor level.

## CODE ISSUES - MECHANICAL, PLUMBING, FIRE AND FUEL GAS:

The mechanical codes adopted by the City of Genevieve, MO are as follows:

- 2012 International Plumbing Code based on the 2012 International Plumbing Code with local amendments
- 2012 International Mechanical Code based on the 2012

International Mechanical Code with local amendments

- 2012 International Fire Code based on the 2012 International Fire Code with local amendments
- 2012 International Fuel Gas Code based on 2012 International Fuel Gas Code with local amendments

The State of Missouri currently has adopted the 2018 International Energy Conservation Code but the City of Genevieve has not adopted this code. The State of Missouri allows individual municipalities to adopt any combination of codes and may even forego code adoption. The City of Genevieve currently has not adopted any form of the IECC nor has it adopted the NFPA 101 Life safety Code.

## CODE ISSUES - ELECTRICAL

The electrical codes adopted by the City of St. Genevieve, Missouri, are as follows:

1. 2012 National Electrical Code
2. 2012 International Existing Building Code
3. 2012 International Residential Building Code

The following Codes have not been adopted:

1. 2018 International Energy Conservation Code
2. NFPA 101 Life Safety Code

# Ultimate Treatment and Use

## LANDSCAPE AND SITE ACCESS

The topography of the site, with the steep slope at St. Marys Road, and the lack of existing accessible parking or an existing accessible path to the house from the street presents challenges for visitors with mobility needs. The narrow parcel specific to the Bauvais-Amoureux House provides limited area to introduce sufficient parking and accessible paths. However, with the acquisition of several adjacent properties by the park, including the Creole (Wilhauk) House and the parcel immediately to the north, sufficient space is now available to consider multiple options for parking for personal vehicles as well as busses and larger vehicles.

The preferred site accessibility treatment includes aspects of Options #1 and #2. Visitors may approach the site along St. Marys Road travelling either from downtown Ste. Genevieve to the north or from Highway 61 to the south. From either direction Option #1 proposes that the circular drive for the Creole House will provide the primary parking area for visitors, and the relatively level grade between the Creole House and the Bauvais-Amoureux House allows for an accessible path between the properties. Option #2 proposes to provide an additional area of accessible parking immediately to the north of the house, reducing the walking distance between the parking area and the new accessible entrance on the west wall.

The proximity of the Bauvais-Amoureux House to other historic resources along St. Marys Road, including the nearby Bequette-Ribault House, creates opportunity for additional walking paths or a longer self-guided walking trail. Interpretive nodes along these paths can be used to educate visitors on the cultural landscape, the relationship to the Common Field, historic photographs, and the changes over time of the House itself.

In considering what site and landscape features might be considered for recreation and interpretive purposes, little historical documentation exists on ancillary structures and site features that existed prior to c. 1900, when the earliest historical photographs were taken. Additional archeological study may be able to assist with identifying evidence for historical site features such as property boundaries, adjacent roads/road rights-of-way, a barn, cabin, orchard, fences, and other features described in the early property inventories.

## ARCHITECTURAL TREATMENT

The preferred treatment recommends a Rehabilitation approach that introduces sensitive interventions for accessibility, along with modern materials and systems for code considerations and visitor enjoyment. For the purposes of visitor experience, the south wall has been identified as the primary façade, although the primary visitor entrance would be shifted to the west for accessibility purposes. An occupancy limit of maximum 50 people is recommended to accommodate egress needs without requiring significant modifications to existing doorways.

To address accessibility needs, the preferred treatment proposes a new accessible ramp at the west wall and to create a new accessible entrance through the west wall frame wall. Modest variations on this approach, such as shifting the accessible ramp to the north or south gallery in lieu of a new entrance at the west can also be considered, still maintaining the west wall as the primary rehabilitation zone. When the ultimate use, programming, and interpretive plan for the House are finalized by NPS, the preferred approach presented in this historic structure report should be revisited to ensure that the goals and treatments align with park needs. Select interior doorways would be widened to provide a path that makes the interior fully accessible to all visitors. This approach minimizes the visual impact of the accessible entrance and the impact to the vertical log walls, which are a character defining feature, while still providing a full and equitable experience to visitors of all capabilities. Due to deflection of the floor framing structure in the east room, the flooring should be leveled, potentially in tandem with the structural repairs to the floor joists.

As part of the preferred treatment, the north gallery is recommended to remain enclosed to provide space for the new mechanical room and to protect the north poteaux-en-terre wall, which is currently unfinished as an interpretive choice to allow visitors to understand the vertical log construction of the original exterior walls. The exterior walls and floor framing of the northern exterior gallery are not historic; the preferred architectural treatment proposes to remove the existing walls enclosing the north gallery and install a new curtain wall system to improve the transparency of this space as an interpretation of an open gallery. The curtain wall mullions are proposed to align with new vertical wood posts to represent the gallery posts, and the curtain wall would be set inboard of the vertical posts to emphasize the early gallery construction. The proposed placement of the new mechanical room in the rehabilitation zone of the north gallery has been chosen for several reasons. First, placement in the attic is not preferred. The goals are to: eliminate water

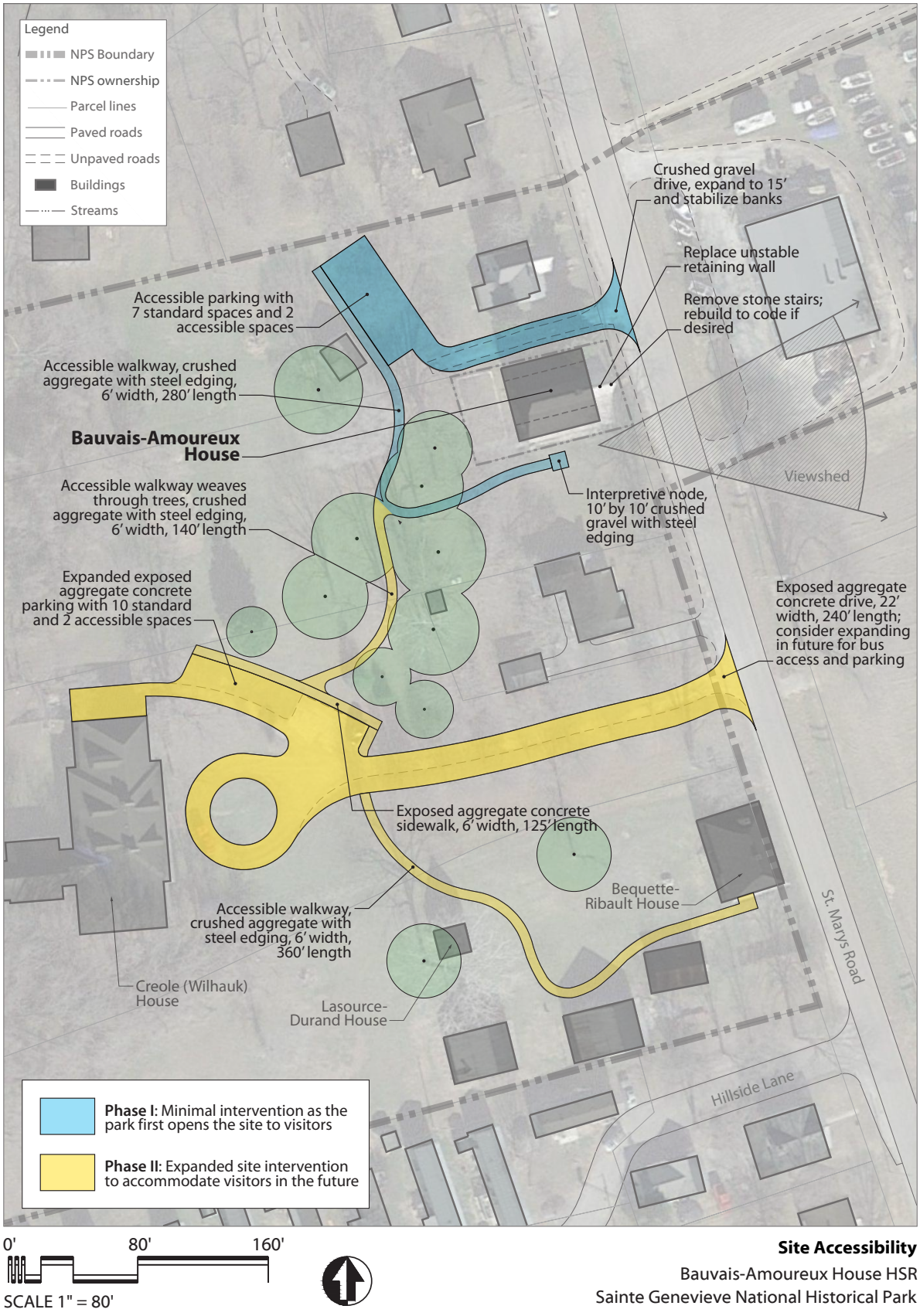



Figure TU-SITE-01. Illustration of Landscape Treatment Recommendations including Site Accessibility and Parking.

sources within the attic level, to limit any weight concerns of the new equipment on the timber framed structure, limit connecting equipment to the originating sources within the site, and to limit the visibility of the equipment within the attic so that visitors can see the most intact fully visible historic elements of the attic as unhindered by new construction. Secondly, the mechanical room was not recommended within the caveau, again to limit the impact of new work on the historic fabric. Also, placing the equipment below grade can create issues with its operation. The treatment options for the north gallery are flexible and may need to be revisited when the ultimate use and Long-Range Interpretive Plan are finalized by NPS. Some consideration has been given to the option that the north gallery should be restored as an open structure, which impacts the treatment and interpretation for the exposed north wall. The preferred treatment approach presented here is proposed conceptually based on feedback from NPS and other stakeholders and the June 3, 2021, treatment workshop. Further analysis of aesthetics and impact to the historic fabric should be performed as part of any future rehabilitation project.

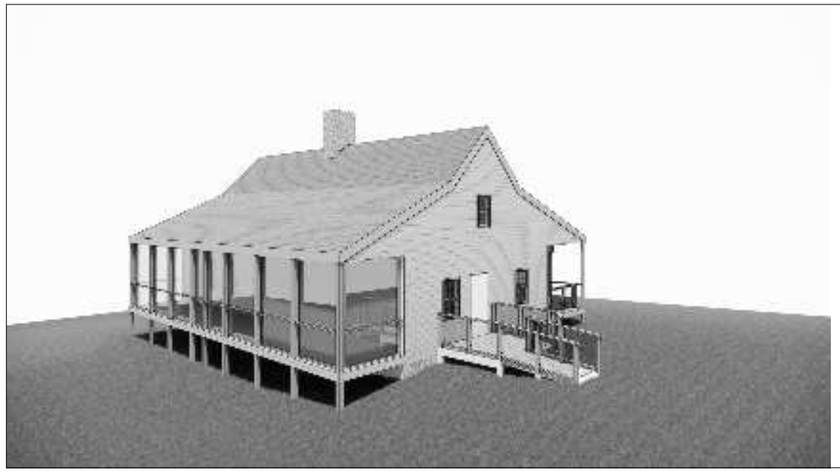
At the south gallery, the existing wood railing does approximate the railing in historical photographs but the configuration of a single rail at 30-inches above the walking surface does not meet modern requirements for fall restraint guardrails. The preferred treatment approach proposes to introduce a new low profile wood and transparent modern railing system behind the existing wood gallery railing. This would show the predominantly historic wood framing configurations while adding code required guardrail elements behind the recreated historic features. The proposed use of transparent panels allows for full visibility through the railing so as to not deter from the view toward the south, but options such as cable rails and other systems with a low visual profile can be considered. The existing stairs would remain to show a more historic configuration at the south facade. A new code compliant stairway would be added at the west to meet modern building code and accessibility railing requirements.

Because of live load restrictions and accessibility challenges, the caveau and attic are not recommended to be directly accessible. However, these spaces contain character defining features and are important for visitors to experience to understand the national significance of the Bauvais-Amoureux House and its construction methodology as a rare poteaux-en-terre structure. The implementation of a means to view the attic truss and framing construction by using digital technology or other methods to view the space in real time is highly recommended. This methodology could be highlighted with additional interpretive planning efforts for the building in totality. Interpretation through exhibit diagrams and models, interactive digital displays, or methods for physical viewing, such as exposure windows, can be used to make these spaces available and enjoyable to the public at the first floor level.

## ENVELOPE SYSTEMS

The existing roofing, exterior wall cladding, and windows are modern replacement materials in need of maintenance and replacement. Some maintenance items are identified to be performed in the short term (as soon as can reasonably be performed) as serious or critical items for protecting the House from water intrusion and further weather-induced deterioration.

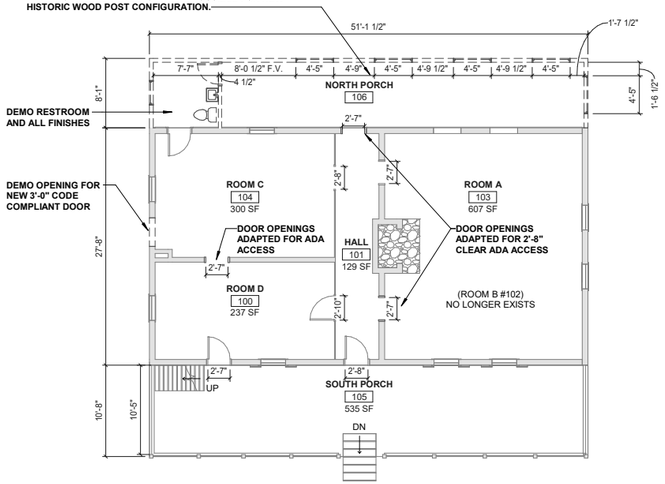
- **Roofing System:** The existing tapersawn cedar shake roofing system, along with the gutters and downspouts, roofing flashing, and cedar trim have reached the end of their useful service life and should be replaced in the short term as a critical maintenance item for maintaining a weather-resistant roofing system. Replacement in kind is recommended.
- **Weatherboard Siding:** The existing cedar weatherboard siding, along with the window cap flashing, and cedar trim, are nearing the end of their useful service life and should be replaced within the next 3 to 5 years as a serious maintenance item for maintaining a weather-resistant envelope. Replacement in kind is recommended.
- **Exterior Plaster:** At the south gallery, the exterior plaster is in good condition and in need of only minor repairs to maintain its serviceability. Below the north and south galleries, the finish on the exterior logs has failed, exposing the logs and pierrotage to the weather. New lime plaster should be applied to the walls below the gallery decks in the short term as a serious maintenance item to protect the exterior logs until structural repairs can be performed.
- **Windows:** The existing windows, along with their trim, weatherstripping, and hardware are in need of maintenance for serviceability. Repairs or replacement should be considered in the next 3 to 5 years as a serious maintenance item for maintaining a weather-resistant envelope and for security of the property. Consideration should be given to the interpretation plan for the House and whether the windows should be replaced in kind as double-hung and fixed multi-lite units or if the windows should be restored to their original design and



NW VIEW

SW VIEW

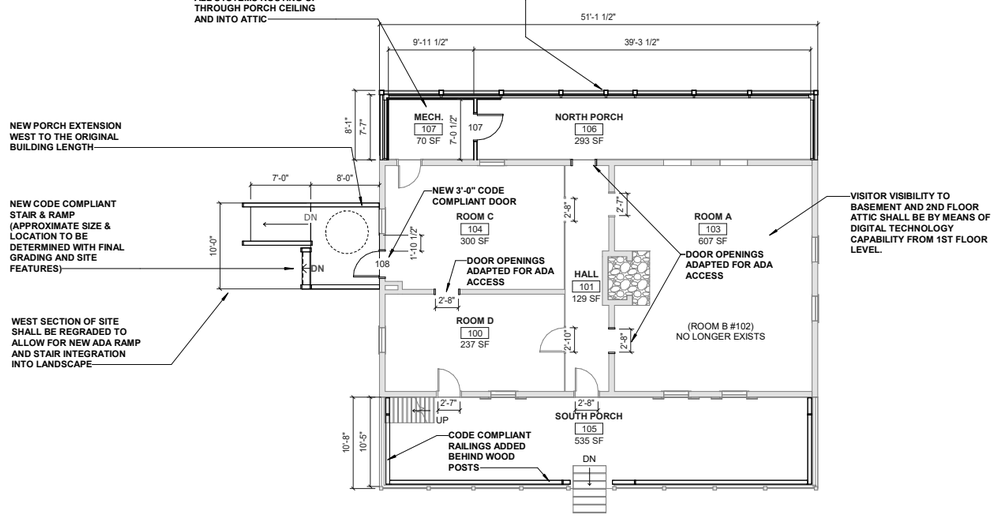
AT NORTH PORCH EXTERIOR, DEMO:
- ALL PORCH WINDOWS
ALL INTERIOR FINISHES AT N, W AND E PLUS FLOOR AND CEILING.
- REMOVAL OF CEDAR SIDING
- UTILIZE EXISTING 2X WOOD FRAMING FOR NEW GALLERIE FRAMING / ADDED FRAMING WHERE POSSIBLE FOR NEW HISTORIC WOOD POST CONFIGURATION.



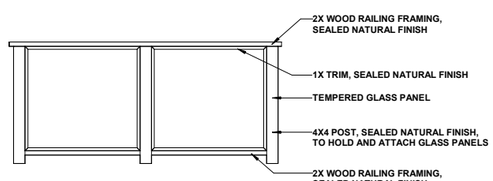

2 PROPOSED FIRST FLOOR PLAN DEMO
1/8" = 1'-0"

NEW MECHANICAL ROOM WITH ALL SYSTEMS ROUTING UP THROUGH PORCH CEILING AND INTO ATTIC

NEW ENCLOSED PORCH CONSTRUCTED WITH EXPOSED WOOD COLUMNS AND FULL GLASS CURTAIN WALL SET BEHIND THE WOOD POSTS. CURTAIN WALL FRAMING SHALL BE ALIGNED AND HIDDEN BEHIND NEW POSTS




1 PROPOSED FIRST FLOOR PLAN
1/8" = 1'-0"




5 PROPOSED RAILING ELEVATION
1/2" = 1'-0"

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configuration as casements.

## STRUCTURAL SYSTEMS

Distress conditions from damage related to water intrusion, insect infestation, and differential settlement issues were identified at the roof framing, exterior vertical log walls, and first-floor framing. In some cases, such as the roof framing, targeted repairs can be performed to stabilize the structure in situ with minimal impact to the historic fabric. For the log walls and the first-floor framing, the distress conditions affect the stability of the overall system and a broader intervention is required to stabilize the structure.

### Preferred Treatment: Replace Deteriorated Log Bearing Ends, Provide Supplemental First-Floor Structure, and Stabilize Trusses

The second treatment alternate employs a Rehabilitation-focused approach that requires significant intervention to the historic fabric (Figure TU-S-02). The intent is to re-establish the structural performance of the exterior walls and first floor, using in-kind materials and construction technologies compatible with the original construction. This approach preserves as much of the historic fabric as possible but does involve fabric loss and irreversible treatments. Alternate #2 is expected to provide a long-term repair solution and improves the House's resiliency in the event of future natural disasters, such as another major flood event.

- The vertical logs walls at the north and south walls will undergo partial member replacement to replace the lowest one-third of each log. The replacement log will be cedar, hewn to match the existing construction, and spliced to the existing log just below the first floor. Further investigation and structural analysis should be performed to determine if partial replacement of every log is required, or if replacements can be strategically located. The pierrotage above the line of replacement shall be stabilized and protected in place, but the pierrotage below will require full documentation and reconstruction. This work will require careful shoring of the structure and phasing of log replacement. The work will also require removal and reconstruction of the north and south galleries, as well as significant excavation along the north and south walls. This work should be coordinated with required archeological studies as it will disturb any remaining archeological evidence of the builder's trench and other below-grade evidence of the original construction.
- The existing shoring will be removed from the caveau. Supplemental floor joists will be installed to provide the structural support for the first floor; the original log joists will remain in place but will not take any of the first-floor load. A new beam along the east-west centerline (similar to the existing shoring) will likely be required to support the floor joists. The new floor framing can be steel or timber. Point shoring may also be installed to support specific interpretive exhibits.
- Truss stabilization and repairs in the attic will be performed as described in Alternate #1.

## PLUMBING AND FIRE SUPPRESSION SYSTEMS

### Water Utility

The existing water service to the Bauvais-Amoureux House is assumed in satisfactory condition as it has been serving the House for a number of years. The size of the water service is appropriately sized if the Park's Service desires the water service to remain in place to serve the exterior sill cock. The City of Ste. Genevieve is making improvements to the water service in the Summer of 2021.

Pending the pressure from the municipal lines after these improvements, a supplementary pump for the new fire suppression system may not be required.

It is recommended that the plumbing fixtures be removed at the existing restroom and that this room be used to accommodate any mechanical equipment to serve the House.

It is the understanding that the Bauvais-Amoureux House will not be an occupied building and that a restroom will not be required in this House in the future as the House will not be occupied full time. The House will only be used for short tours.

### Sanitary Waste Utility

The existing 4" sanitary sewer for the Bauvais-Amoureux House is of ample size to continue to serve the House. It is recommended that the sanitary main leaving the House be scoped with a camera and cleaned to ensure its integrity to serve the House into the future.

It is recommended that any space in the House used for mechanical equipment will want to be provided with a floor drain which can be connected to the existing sanitary main serving the House.

It is recommended that the 1-1/2" DWV sanitary vent currently running up the exterior side of the west wall of the building be removed and a new vent through the roof

# Structural Treatment Alternate #2 (Preferred Treatment)

| Advantages | Disadvantages |
|---|---|
| • Replacing the logs in-kind can be performed using historically appropriate materials and construction methodologies, which preserves the key character defining feature of the poteaux-en-terre construction.<br>• The log joists will remain in-situ to preserve the original structural system of the first floor, and visible modern interventions in the caveau will be less obtrusive than existing shoring.<br>• Lower initial construction costs, but costs will be required for regular monitoring and future repairs. | • This approach is intended to provide long-term structural performance; however, wood in direct contact with soil is subject to deterioration, and repairs or log replacements should be anticipated in the future.<br>• Replacing the failed bearing ends of the logs represents a significant and irreversible loss of historic fabric.<br>• Replacing the logs will require partial deconstruction of the gallery structures and potential disturbance to the pierrotage and interior finishes.<br>• Excavations along the north and south walls will permanently disturb any archaeological resources adjacent to the House.<br>• Higher risk during construction due to disturbing the vertical logs; careful shoring design and monitoring during construction will be required.<br>• This alternate also likely represents the highest initial construction cost due to the in-kind replacement materials and complexity of the repair work. |

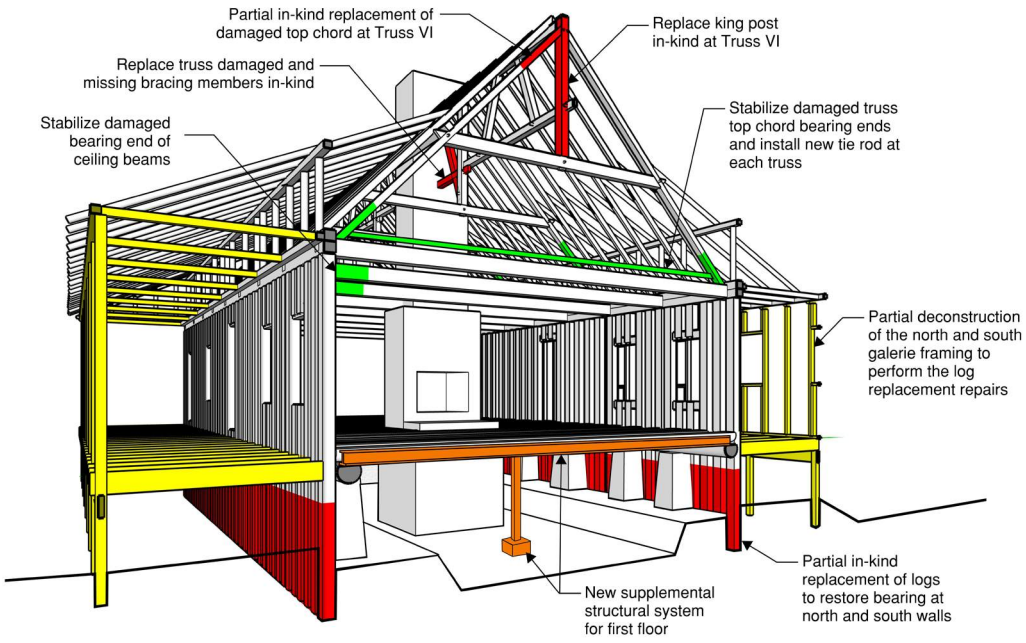



Figure TU-S-02. Isometric section looking west, showing impact of structural Alternate #2.

be added. A new vent line through the roof to serve the sanitary system would provide a more aesthetically pleasing appearance versus the existing vent exposed at the west wall. Providing a 4" vent through the roof is recommended to meet the plumbing code.

## Gas Utility

The existing gas utility at the Bauvais-Amoureux House is recommended to be left in its current state with the utility capped outside the building if this utility is not used for any heating equipment in the building. If the desire is to utilize gas to heat the building, it can easily be extended to any new equipment added.

## Fire Suppression

As a large portion of the Bauvais-Amoureux House fire suppression system piping would likely need to be installed in areas where no heat would exist, the use of a wet-pipe fire suppression system would not be recommended. Temperatures in the caveau and grenier can be below freezing under normal winter months.

The recommended fire suppression system for the Bauvais-Amoureux House would be a dry-pipe sprinkler system. The use of a dry-pipe fire suppression system will allow fire protection of the entire House including the non-tempered areas such as the caveau and grenier.

A dry pipe system is the second most common type of system. A dry-pipe fire suppression system is a piping system filled with pressurized air or nitrogen instead of water. This air holds a remote valve, known as a dry pipe valve, in a closed position. Located in a heated space, the dry-pipe valve prevents water from entering the pipe until a fire causes one or more sprinklers to operate. Once this happens, the air escapes and the dry pipe valve releases. Water then enters the pipe, flowing through open sprinklers onto the fire. It is used in spaces where the ambient temperature may be cold enough to freeze the water in a wet pipe system, rendering the system inoperable, such as in unconditioned attic spaces or crawl spaces. Dry-pipe systems often require a small air compressor to be utilized to maintain the pressure in the system as the system can and will lose air pressure over time and the air compressor may have to activate to maintain any loss in pressure. Another form of dry system involves the use of dry heads. This type of system assumes the piping system has water in it but the heads stay dry until such time as their activation. These types of heads are used when protecting outdoor areas such as balconies, breezeways, porches, etc. or when protecting cold storage areas such as freezers where the piping system is installed in a tempered space but needs to protect a space which has a freeze potential.

If NPS desires to provide a higher degree of protection for the House from an accidental activation, a pre-action, dry-pipe system would be recommended. The addition of smoke and heat detectors would provide an additional layer of detection, ensuring no sprinkler system activation unless a fire event occurs.

Advantages of using a pre-action, dry-pipe fire sprinkler system:

- A dry-pipe sprinkler system provides automatic protection in spaces where freezing is possible.
- A dry-pipe sprinkler system with pre-action device offers an advantage when compared to conventional wet-type and dry-pipe sprinkler systems for the protection of collections, artifact and water sensitive documents. The addition of the pre-action devices such as heat and smoke detectors provide an added safeguard against false discharges of the sprinkler system as the supplemental devices must be activated first before the water in the piping system is discharged.

Disadvantages of using a pre-action, dry-pipe fire sprinkler system:

- Increased complexity – Dry-pipe systems require additional control equipment and air pressure supply components which increases system complexity. Without proper maintenance this equipment may be less reliable when comparable to a wet-pipe system.
- Higher installation and maintenance costs - The added complexity impacts the overall dry-pipe installation cost. This complexity also increases maintenance expenditure, primarily due to added service labor costs.
- Lower design flexibility - There are strict requirements regarding the maximum permitted size (typically 750 gallons) of individual dry-pipe systems unless the water delivery time is less than 60 seconds.
- Increased fire response time - Up to 60-seconds may pass from the time a smoke or heat detector activates and a sprinkler head opens until water is discharged onto the fire. This will delay fire extinguishing actions, which may produce increased content damage.
- Increased corrosion potential - Following operation, dry-pipe sprinkler systems must be completely drained and dried. Otherwise remaining water may cause pipe corrosion and premature failure. This is not a problem

with wet pipe systems where water is constantly maintained in piping.

# MECHANICAL SYSTEMS

### FURNACE SYSTEM WITH ELECTRIC HEAT

Any consideration of the options presented in this Historic Structures Report for Bauvais-Amoureux House will be influenced by whether or not the NPS takes a preservation or rehabilitation approach to this building. Whether to add just heating or further enhance the indoor environment by adding cooling, dehumidification or humidification will include more extensive modifications to the building envelope required as part of a rehabilitation effort. If rehabilitation is the chosen path, the building's lack of wall, roof and floor insulation and an adequate vapor barrier will need to be addressed to allow any mechanical system to operate efficiently. Without addressing the building envelope, increasing equipment operating capacities will be required.

This equipment option would include a vertical electric furnace, insulated metal ductwork for air distribution and control thermostat.

Air distribution would be accomplished by use of insulated metal ductwork installed to the grenier and run to new air outlets located at the perimeter of the Main Level rooms. Return air ductwork and a return air grille would be provided at the Main Level mechanical room with the grille located at the north gallery allowing a return air pathway utilizing the central hallway and other open doorways.

An energy recovery ventilator would be provided at the mechanical room and be ducted to the furnace with ventilation air introduced using a duct within a chimney extension at the grenier allowing outside air to be drawn into the ERV and then ducted to the furnace return air. Exhaust air from inside the building would be exhausted out of the building at the grenier space.

A single wall-mounted, central thermostat would provide system control and temperature monitoring. Unless multiple furnaces were provided, only one zone of control would be present.

## Electric Furnace System – Advantages

- Simple system to control and operate
- Furnace relative small physical size making them easy to mount in the grenier space
- Relatively inexpensive to replace should equipment breakdown or wear out
- Lowest first cost compared to other more sophisticated systems such as air handling units and boilers
- Cooling and Humidification could be added to enhance environmental conditions
- Allows an energy recovery unit for ventilation to be incorporated into system
- Can provide a Building Class IV with a Type B Class of Control assuming building envelope upgraded
- Does not require an increase in electrical service if heating capacity is limited in size
- With a proper vapor barrier and added insulation, temperature and humidity levels should be able to maintained at 72°F and 50% RH in the summer and 68°F and 30% RH in the winter with a drift of approximately 10°F and 10% RH

## Electric Furnace System – Disadvantages

- Limited heating capacity – up to 25 kW which may require additional duct electric heating coil to boost heating capacity
- Requires periodic maintenance for equipment similar to standard residential equipment
- Allows for ductwork to route in the grenier space providing a less intrusive means of air distribution
- If heat pumps are utilized over condensing units, heat pumps have a slightly higher first cost
- A single thermostat providing only a single zone of control of the furnace system
- Limited capability to providing enhanced environmental control
- May require that the main electrical service be increased in capacity if the service cannot handle the increase load imposed by the added electric heat

# ELECTRICAL SYSTEMS

## Primary Power Distribution

The existing power pole with the electrical meter, fiber optic box, and overhead electrical and communication lines disrupts the view to the east looking at the fields.

It is recommended to relocate the power pole to the north, as far as possible, but still be within the property lines; along with this, the overhead utility company communication lines could be routed underground or routed overhead on the opposite side of the road.

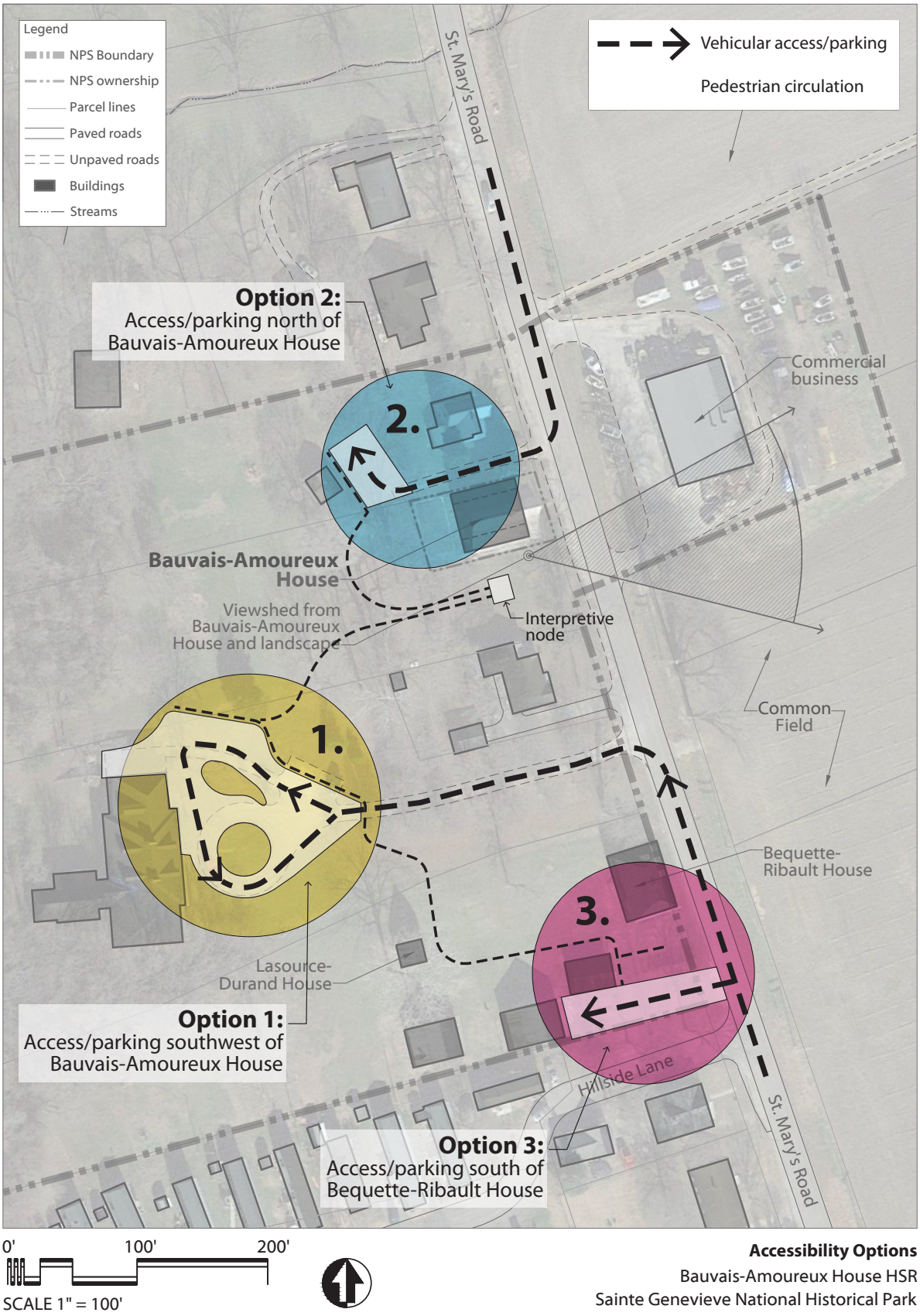



Figure TU-SITE-01. Site Access Treatment Options.

This work and associated costs will need to be coordinated with the local electrical and communication utility companies. *(Re: Electrical Drawing ES-1 in Appendix F)*

## Electrical Service

When the existing outside power pole is relocated, then the existing 240/120-volt, single-phase underground electrical service to the building will need to be replaced. It would be recommended, along with replacing the underground electrical electric service, to also replace the indoor electrical load center with a new electrical panel.

The new electrical panel would conform to NPS standards, such as panelboard construction, copper bus bars, copper lugs, surge suppression device, adequate spare breakers, and space.

The new electrical panel could be installed in the same location as the previous load center or installed in a different location to better serve building improvements.

## Grounding

When the new electrical panel is installed, it is recommended to install a grounding electrode system to a copper-clad driven ground rod and to the metallic water service.

## Interior Wiring

If the new electrical panel is located in the same location as the previous panel, then the existing MC cables can be reconnected to the new panel. If the new electrical panel is installed in a different location, then the previous load center then some of the existing metal clad cables will have to be rerouted or replaced.

If additional lighting fixtures are added to serve building improvements, it is recommended to use an MC cable wiring method, as it is easier to conceal and route around the various wood structure of the building.

## Lighting

The existing incandescent and fluorescent lighting should be replaced with light emitting diode (LED) type for energy conservation. The new LED lighting should have the style and locations needed to compliment the building improvements and intended usage.

## Devices (Switches and Receptacles)

Lighting control may be needed to be modified to be compatible with future building use. Additional receptacles may need to be added to support future building use needs.

## Communications

Depending on the future use of the building, it is recommended to extend the existing fiber optic line into the building to a small rack-mounted patch panel. From the patch panel, Category 6A, copper, twisted-pair data cables can be extended out to new communication outlets to serve future loads.

The new rack-mounted patch panel needs to be installed in a small closet or cabinet in a conditioned space.

## Fire Alarm Systems

It is recommended to add a fire alarm system to the building. The fire alarm system would monitor the flow and tamper switches on the new fire sprinkler system.

An aspirating-type, smoke detection system would sample the air on all three levels and provide early smoke detection of the spaces.

## Exit Lighting and Emergency Lighting

Depending on the future use of the building, exit lighting and egress lighting may be required to be installed. The egress lighting could be accomplished by utilizing the normal lighting fixtures, backed up by a small battery powered inverter.

### INTRUSION ALARM SYSTEM

It is recommended to add an intrusion alarm system to the building. The intrusion motion detectors could be the wireless-type.

### LIGHTNING PROTECTION SYSTEM

A lightning protection system could be added to the building; however, the visible lightning arrestors on the roof, and the grounding conductors routed down the outside of the building to ground rods, would be visible on the sides of the building and would be objectionable.

# Treatment Alternatives Considered but Not Selected

## SITE AND LANDSCAPE TREATMENT ALTERNATIVES CONSIDERED BUT NOT SELECTED

### SITE ACCESS ALTERNATIVE OPTIONS

Treatment options for access to the Bauvais-Amoureux property were developed to provide alternatives for consideration by the NPS related to parking and visitor circulation in conformance with Architectural Barriers Act Accessibility Standards. Due to the presence of steep slopes immediately adjacent to the land parcels along St. Marys Road, the proposed alternatives (Figure TU-SITE-01) illustrate potential ways in which visitors might arrive, park, and reach the environs of the Bauvais-Amoureux House. Each of the alternatives assumes the use of an adjacent parcel given the limited land area associated with the current property. However, each of the adjacent parcels fall within the authorized boundary of Ste. Genevieve National Historical Park. The acquisitions of easements or adjacent parcels would be required to implement any one of the access alternatives presented herein. Given the proximity of the Bauvais-Amoureux House to other historic properties of interest, the alternatives also indicate the potential to establish a walking tour within the block along St. Marys Road so visitors might experience several properties built during a similar time frame as the Bauvais-Amoureux House, such as the Bequette-Ribault House and the Lasource-Durand House.

### SITE ACCESS TREATMENT OPTION 1

This option would provide vehicular access from St. Marys Road, south of the Bauvais-Amoureux House, via the large circular driveway fronting the Wilhauk Residence and set back some distance from the road. The circular driveway is edged by level terrain potentially offering ample opportunity for parking and the establishment of an accessible visitor walkway leading to the Bauvais-Amoureux House across gently sloping topography. The walk would potentially lead to the yard south of the Bauvais-Amoureux House. An additional visitor walkway might also lead from the parking area south and east to the Lasource-Durand House, the Bequette-Ribault House, and associated structures.

### SITE ACCESS TREATMENT OPTION 2

This option would provide vehicular access from St. Marys Road, north of the Bauvais-Amoureux House, via an improved version of the existing residential gravel driveway that leads to a small outbuilding structure. The access drive cuts through the steep slope west of St. Marys Road, passing the north façade of the Bauvais-Amoureux House, and ends in a relatively level open area adjacent to the outbuilding. There is sufficient level terrain to accommodate a small parking area and develop an accessible walk leading to the open lawn south of the Bauvais-Amoureux House.

### SITE ACCESS TREATMENT OPTION 3

This option would provide vehicular access from St. Marys Road south of the Bequette-Ribault House where there is currently access and parking on gently sloping topography. The parking area would be expanded, and an accessible walk developed to the Bequette-Ribault House, Lasource-Durand House, and other associated structures, as well as lead to the lawn south of the Bauvais-Amoureux House.

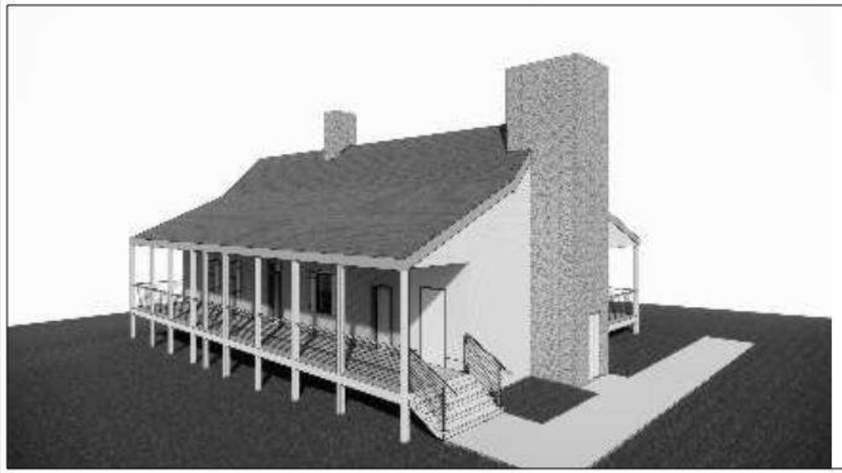
## SITE TREATMENT CONSIDERATIONS COMMON TO ALL ALTERNATIVES

Site treatment recommendations should be coordinated and incorporated into the preferred architectural treatment described in the preceding sections.

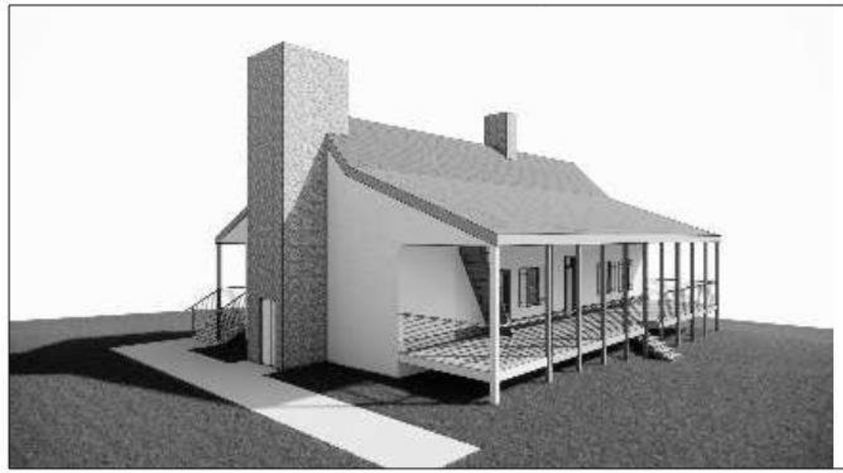
- Undertake archeological survey of the Bauvais-Amoureux House property and the adjacent properties likely to be included in future parking and accessible walk development. Investigate the information potential of the properties. Identify any known or likely below-ground resources that should be protected and avoided in the siting of features that will require ground disturbance.
- Consider undertaking LiDAR study of the Bauvais-Amoureux House and adjacent properties likely to be included in future parking and accessible walk development to determine the potential locations of former roads, gardens, buildings, and other features that are no longer in evidence aboveground to complement an archeological survey.
- Evaluate the stability of the steeply sloped terrain along St. Marys Road and the gravel driveway north of the Bauvais-Amoureux House to determine the need to stabilize the soil and undertake any treatments necessary to protect against erosion.
- Consider alternatives for providing an entrance drive, accessible parking facilities, and an accessible walk providing access to an interpretive node and an accessible entrance into the Bauvais-Amoureux House. Alternatives,

which might be developed in two phases, include use of the gravel driveway north of the house to provide access to a small parking area near an existing shed and of the Creole House driveway where a larger parking facility might be developed to accommodate more cars as well as buses. Both parking areas could be connected to an accessible walk leading to an interpretive node near the house and an accessible entrance. The smaller parking area could be developed first as a way to minimize site interventions until visitation increases, requiring expansion of visitor amenities and accessibility to the Bauvais-Amoureux House. In order to accommodate future needs, the Creole House site might be developed. The smaller parking area could continue to serve park operations and maintenance access needs should the larger parking area be developed.

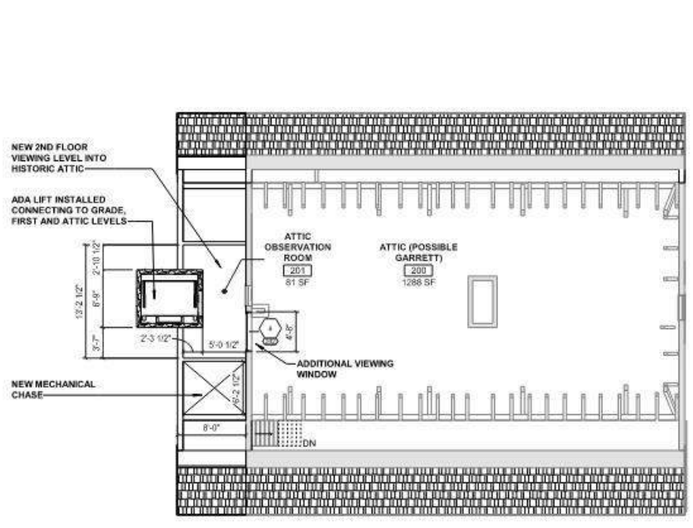
- Evaluate the potential compatibility of several materials and finishes for establishment of new parking and accessible walk features. Consider using paving materials that are finished with a warm brown hue, which is more visually compatible with the historic property than blue-gray or bright white surfaces. Consider using materials such as crushed aggregate and exposed aggregate concrete to convey a vernacular character as possible. Where crushed aggregate is used to surface new circulation features, contain the material with steel landscape edging.
- Consider using the minimum dimensions possible in accommodating the new circulation features, such as roads, parking bays, and walks, while ensuring that the features meet anticipated visitation needs and accessibility guidelines. Accessible walks are recommended to be 6 feet wide. The smaller parking area is anticipated to include seven parking spaces, two of which would be accessible, while the larger parking area is proposed to include ten parking spaces, two of which would be accessible.
- Provide an opportunity for visitors to understand the architecture of the Bauvais-Amoureux House from the south exterior as well as the important view to the Common Field to the east by establishing an interpretive node near the stairs leading to the south gallery and front door. Pave the interpretive node with the same material as the accessible walk.
- Consider alternatives for enhancing the understanding of the Common Field that might include providing a wayside exhibit at the interpretive node or providing a link to an online interpretive site that includes historic maps and photographs. Alternatively, should the opportunity arise to acquire the building located east of St. Marys Road that is within the viewshed of the Bauvais-Amoureux House, consider options for removal to enhance this key viewshed and visual connection between historic aspects of Ste. Genevieve.
- Document all landscape features planned for change or removal. Retain documentation records in the park archives.
- Remove the existing stone stairs leading to the Bauvais-Amoureux House cellar entrance due to their unstable condition and the trip hazard posed by the inconsistent riser heights. Should access from St. Marys Road remain desirable, rebuild the stairs in accordance with current codes and conventions. Edge new stairs with code compliant handrails.
- Replace the existing retaining wall that edges the walkway leading to the cellar entrance. Remove the unstable stonework. Reestablish a stone retaining wall along the walk margins that is structurally sound and stable. Use compatible stone in constructing the new wall.
- Retain and maintain the stone walkway that edges the Bauvais-Amoureux House to the south. Consider the suitability of the walk to support accessibility needs. Should the south walkway be incorporated into the accessible circulation system associated with the property, consider alternatives for enhancing accessibility while retaining the existing stone pavers.
- Retain and maintain the well or cistern structure located along the margin of the south walkway. Undertake further investigations into the history and date of origin of the well as part of the recommended archeological investigations, to determine whether it was present during the period of significance. Further evaluate the treatment of the structure once additional information has been determined.
- Retain and maintain the well or cistern structure located southwest of the Bauvais-Amoureux House. Undertake further investigations into the history and date of origin of the well as part of the recommended archeological investigations, to determine whether it was present during the period of significance. Further evaluate the treatment of the structure once additional information has been determined.
- Retain and maintain existing trees southwest of the Bauvais-Amoureux House to provide shade and to help screen potential contemporary parking facilities. Engage



OPTION 2 - NW

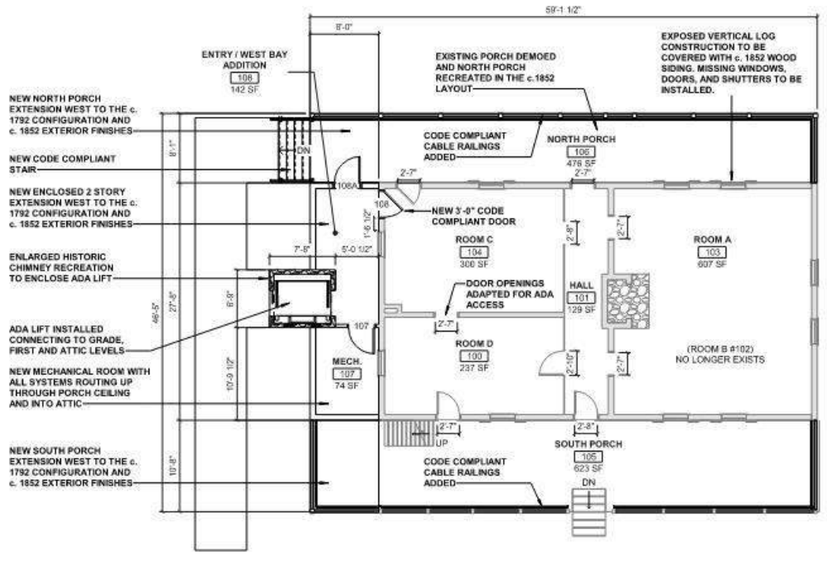


OPTION 2 - SW




2 PROPOSED ATTIC (POSSIBLE GARRET) FLOOR PLAN

1/8" = 1'-0"




1 PROPOSED FIRST FLOOR PLAN

1/8" = 1'-0"

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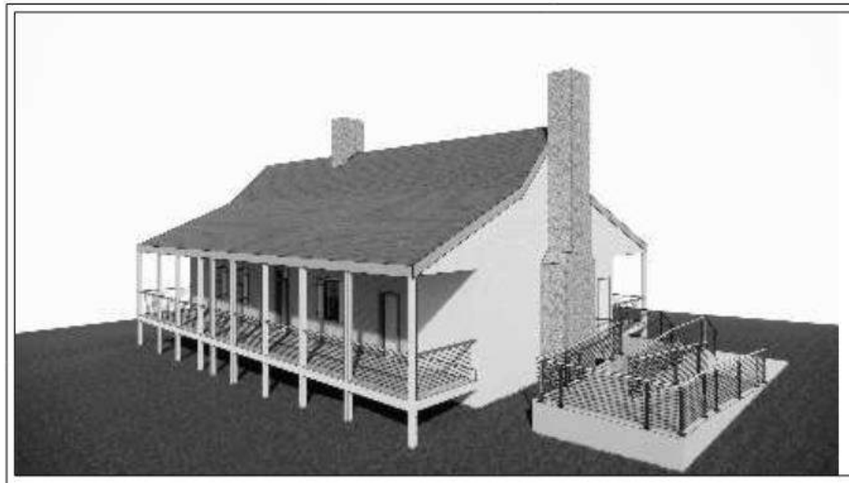
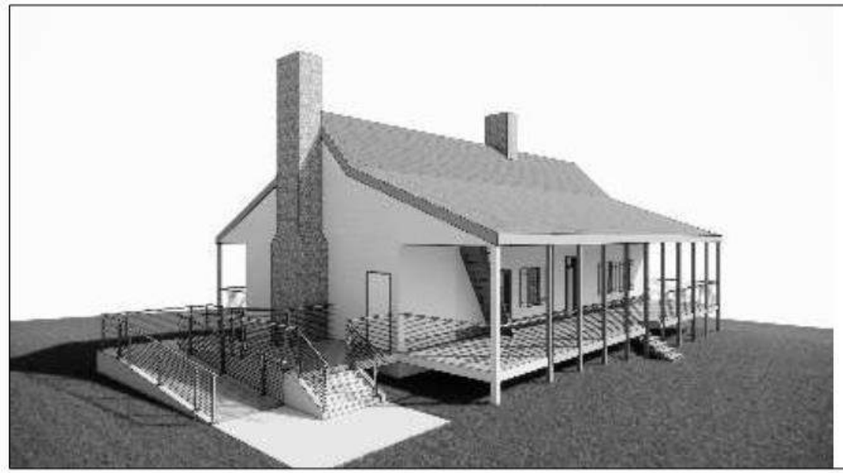
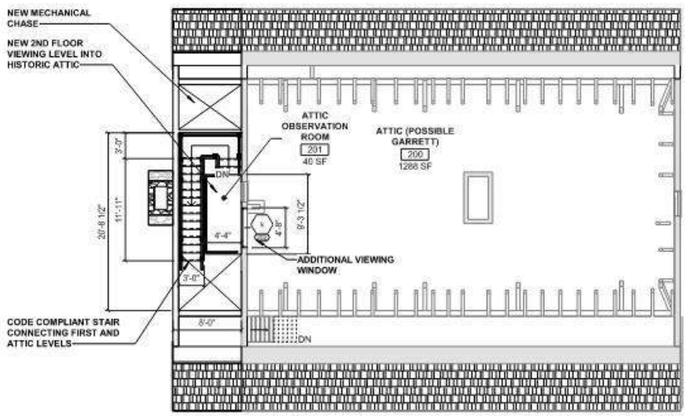


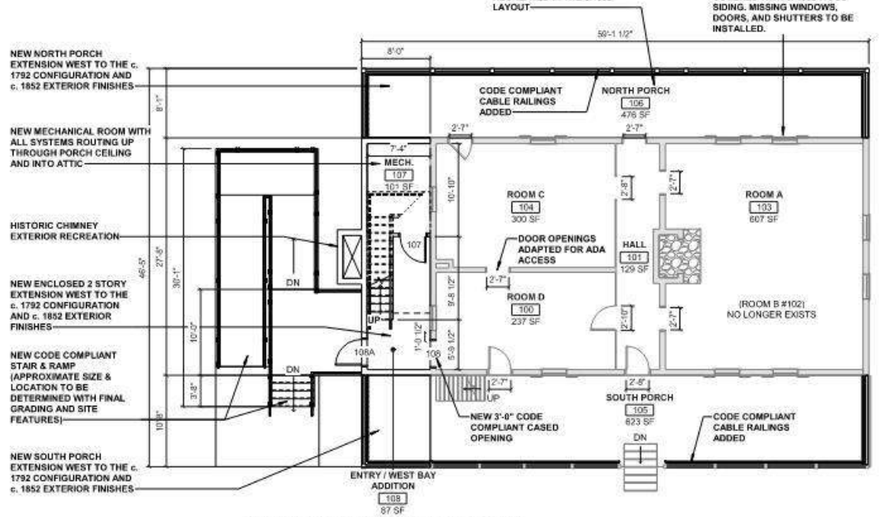
OPTION 3 - NW



OPTION 3 - SW




2 PROPOSED ATTIC (POSSIBLE GARRET) FLOOR PLAN
1/8" = 1'-0"




1 PROPOSED FIRST FLOOR PLAN
1/8" = 1'-0"

| | | | | |
|---|---|---|---|---|
| | DESIGNED: JCAWBY<br>CADD<br>BHEIDE<br>TECH. REVIEW:<br>DATE: 09/24/21 | SUB SHEET NO.<br>A3 | TITLE OF SHEET<br>DESIGN OPTION 3<br>STE. GENEVIEVE NATIONAL HISTORICAL PARK | DRAWING NO.<br>PKG. NO.<br>SHEET 3 OF 3 |

an arborist to evaluate all trees to remain and identify any hazardous or potentially hazardous conditions requiring pruning or other recommended treatment. Ensure that trees are evaluated regularly, at least annually, for the same purpose.

## ARCHITECTURAL ALTERNATIVES CONSIDERED BUT NOT SELECTED

The preferred treatment approach is included in an earlier section of this report. The information contained in this section highlights design options that were explored as additional alternatives but are not preferred to be implemented at the house. The main objectives of these design options were to preserve the historic fabric, provide accessibility and stairway access to the building for use by all and to maximize areas of the building that are not original or are missing from the historic building footprint.

In each of the options 2 and 3, the area of new construction directly adjacent to the existing building (other than the stair or ramp areas in most cases) have been limited to the size and shape of the original western most bay that was removed in 1880s to c. 1900. This area of construction could be used as an interpretive zone and could be designed using methods that could emphasize the original c. 1792 through c. 1852 time periods, when this western bay existed.

In relation to accessibility and access for all visitors, the main access to the building itself should be from the north porch addition or from the west facade. This location would not only entail the least amount of impact to the appearance of the building from the street and from the perceived front south facade, but also have the least impact on the most character defining materials still intact from the c. 1792 time period. These areas are also recommended as rehabilitation zones because the north porch is from c. 1963 and the west wall of the existing building dates to the 1880s - c. 1900. The other three main exterior walls at the north, east and south are from c. 1792 and contain poteaux-en-terre construction. All means to limit new construction or widening of doors within these walls is highly recommended.

The design options indicate accessibility options that could be gained from grade to the first and second floor/ attic level. The first floor level can be accommodated easily by means of stairways and ramps. First floor accessibility could be achieved through the implementation of several measures indicated on the design options. The length required for these features, as shown on the design options, show the approximate areas required but final designs in conjunction with a chosen landscape design configuration and features would be required. Most ideally, if ramps are utilized, they would be designed into the site to limit their impact visually and could become a more natural progression to ideally shorten the length of ramps required.

The attic level space is considered a highly important character defining space that visitors should be able to see. The goal for all visitors is to understand the construction techniques used during the building's original construction in c. 1792. The design options indicate accessibility options that could be gained to the second floor attic level. Design options 2 and 3 show means to access the attic level from outside the existing building footprint and to provide a larger viewing window into the attic from a viewing platform adjacent to the west wall.

In each of these options, the integration of a new mechanical, electrical and fire protection room is shown, again outside of the existing most historic building footprint portions. This room would contain the equipment with most of the distribution being routed vertically into the attic. This distribution would need to be coordinated for its design impact and to install the least intrusive methods within the attic (to limit visual intrusions any occupants would be able see) and new connections at the finished ceiling level of the first floor and possibly a portion of the basement.

The design options attached have specific notes indicating the design intent for each.

Two additional design concepts, not included in this report, were also explored for their feasibility and impact. The concepts endeavored to provide 100% fully accessible stairway and elevator lift from grade to first floor and up to the attic level. The minimum sizes required for these elements was out of scale to this historic building and their impact was detrimental to the historic fabric and scale of this house. Fully accessible and code means to the second floor is not recommended. Please refer to the preferred treatment approach which provides the least impact to this important structure and its small residential scale.

## STRUCTURAL TREATMENT ALTERNATIVES CONSIDERED BUT NOT SELECTED

The vertical logs were found to have loss of integrity below-grade, where the logs function as the foundation for the exterior bearing wall and roof framing. The deterioration was observed to affect approximately 85% of the vertical logs. Although the logs do not appear to be in imminent

danger of failure, the deterioration compromises their long-term structural performance. Continued differential settlement relative to the central stone masonry chimney should be expected, which will increase the distress to the roof framing. Additionally, with a compromised foundation, the exterior walls and roof framing are vulnerable to damage from future natural disasters, particularly another major flooding event.

The roof framing is directly supported by the exterior vertical log walls. Distress to the roof structure was documented, both as a global condition related to the differential settlement of the exterior walls and damage to specific framing members by insects and water intrusion. This distress presents in the form of deflected and failed bracing struts, deflection of the ridge beam, failed truss and ceiling beam bearing conditions, damage to the Truss VI top chords and king post, rotation of the primary rafters at bearing conditions, and deflection of the wall top plate.

In addition to the deterioration of the vertical logs, the framing of the first floor has failed in place due to significant insect damage and deterioration of the original log joists. The existing shoring is providing the structural support for the first floor but, as designed, may not support the building code-required live loads for the intended use as an interpretive space with un-metered visitor access.

Many treatment alternatives to stabilize, strengthen, or restore the capacity of the House's structural systems are available, with varying impacts to the historic fabric, load paths, and visitor experience. NPS has expressed a preference for treatments that preserve the historic fabric whenever possible, replace materials in-kind, and repair or replacement methods that respect the unique construction technology represented by a poteaux-en-terre structure.

Other treatment alternatives not included in this report were also explored for feasibility and impact to the structure. In the course of the treatment workshop, these alternatives were determined to have a negative impact to the integrity and significance of the structure and were removed from further consideration.

## TREATMENT ALTERNATE #1: MONITOR EXTERIOR WALLS, IMPROVE FIRST FLOOR SHORING, AND STABILIZE TRUSSES

The first treatment alternate employs a Preservation-focused approach with the least intervention to the historic fabric (Figure TU-S-01). The intent is to stabilize the existing construction, provide supplemental structural support, and monitor the structure for continued evidence of differential settlement or other distress conditions. This approach is the most conservative for conservation of the historic fabric and minimizes irreversible treatments in the short term. It should be understood that Alternate #1 will likely not be a long-term solution and that repair or stabilization of the vertical logs will be required at some point in the future.

- The vertical logs walls will remain in place in their current condition. Regular visual inspection will be performed by park staff to identify early signs of differential settlement, including cracks in plaster finishes and documentation of level gauges to be installed at strategic locations. No less than once annually, to be performed at approximately the same time of year, a laser-assisted level survey will be performed of the top plate and attic floor (the structures supported by the vertical logs) to document any differential settlement of the logs. While evidence of movement or further distress are not identified, the monitoring procedures will proceed annually; if movement or distress occur, further consideration for more invasive stabilization, repairs, or replacement will be required.
- The existing shoring will be redesigned to provide the structural support for the first floor required by building code. The original log joists will remain in place but will not take any of the first-floor load. Steel shoring can provide smaller member sizes and reduce the visual impact to visitors inside the caveau. Steel is also readily identifiable to laypersons as a modern intervention and will not be misinterpreted as part of the original construction. Point shoring can also be installed to support specific interpretive exhibits as required. The new shoring will require localized excavation for foundations and should be coordinated with required archeological studies.
- Truss connections and bearing conditions that are damaged or deteriorated will be stabilized in place or repaired with partial member replacements. To preserve the truss timbers wherever possible, stabilization be performed with supplemental structural steel, which may require the construction of steel "shoes" at truss bearing conditions and the introduction of steel tension rods running north-south. Where partial member replacement is required, such as the apex of Truss VI, replacement shall be in-kind using detailing appropriate for the original construction era and methods. These repairs can be performed above the attic floor to minimize visual impact on the interior. The attic flooring should be replaced, or a new walkway constructed to provide access for maintenance staff.

# Structural Treatment Alternate #1 (Not Selected)

| Advantages | Disadvantages |
|---|---|
| • Preserves the most historic fabric of the treatment alternates.<br>• Preserves the historic construction methodology and the structural character-defining features with minimal modern interventions.<br>• Respects the materials, condition, and age of structure, and modern interventions are readily differentiated from the historic fabric through design decisions and material selection.<br>• No impact to the interpretation or visitor experience on the first-floor interior, as the repairs are contained within the caveau and grenier.<br>• Lower risk during construction because fewer structural members are disturbed during repairs compared to the other treatment alternates.<br>• Stabilization measures are reversible but do have some impact on the in-situ historic materials. | • This alternate is not a permanent solution. Monitoring the vertical log walls allows better understanding of the behavior of the structure which will influence the long-term treatment recommendations.<br>• The shoring that will remain in the caveau will be extensive, which impacts the visitor experience and understanding of this space.<br>• The structure will be vulnerable to damage by natural disasters, such as a flooding event. |

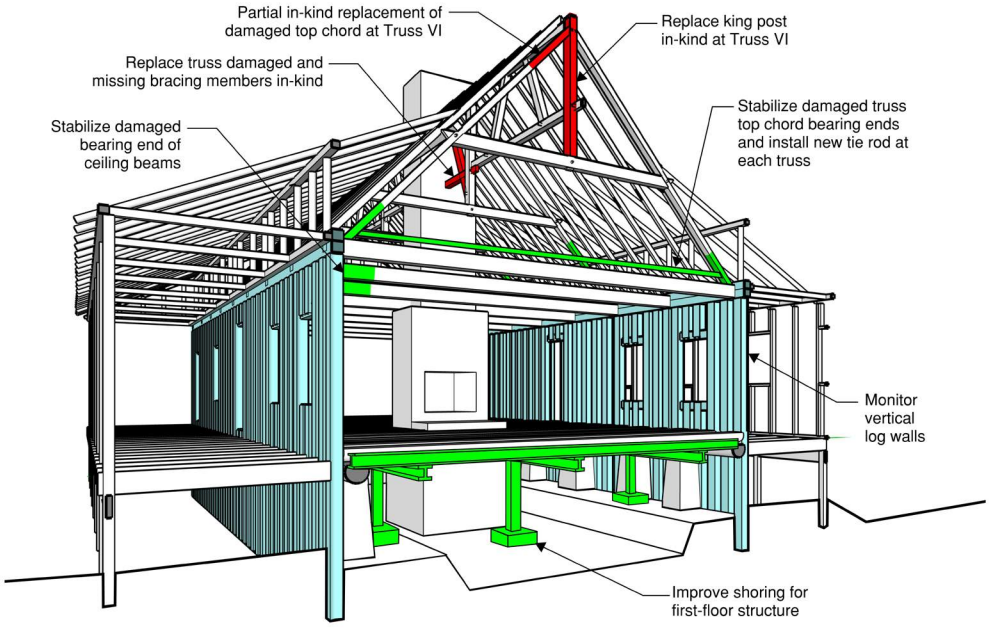



Figure TU-S-01. Isometric section looking west, showing impact of structural Alternate #1.

# MEP/FP SYSTEM ALTERNATIVES CONSIDERED BUT NOT SELECTED

## FIRE PROTECTION ALTERNATIVES

The structure currently has no fire suppression system. Property protection and life safety are the benefits a fire suppression system would offer. It is with these benefits that the Bauvais-Amoureux House is recommended to be upgraded with an automatic fire suppression system. This is based on the building techniques and materials used in its construction where extensive use of wood timbers and other wood construction make up a vast majority of the structure. Protection against fire is of major importance.

Utilizing active fire safety features found in modern automatic fire detection and suppression systems provide occupant notification, alarm transmittance and the ability to suppress fire growth until the fire department arrives. Relying on active systems with proper maintenance and alarm supervision, they have a high degree of reliability.

Active fire protection is characterized by detection and response. Detection of a fire through smoke or heat sensors initiates a chain of events that reduces threats from a fire. Once a detection system is activated, other actions including sounding alarms and opening of fire sprinklers or other fire suppression systems occur. Fire protection system minimum requirements are to detect a fire, alert the occupants or fire department of a fire emergency, control smoke, and control or extinguish the fire.

## FIRE SUPPRESSION SYSTEM TYPE

There are many types of fire protection or suppression systems utilized in buildings today to mitigate the risk against the loss of life and property in the event of a fire. The fire suppression system should be based on the building occupancy group, size of the building/fire area, height of the building, and occupant load. The fire suppression system should comply with the current NFPA and IBC requirements as they relate to building usage. A pre-action, dry-pipe fire sprinkler system is recommended for the building. Below is additional information on alternative systems considered but not selected.

The various types of systems in use range from wet-pipe systems, dry-pipe systems, anti-freeze systems, deluge systems, and pre-action systems. Each of these system types has certain characteristics which are listed as follows:

- **Wet-Pipe System -** A wet pipe system is the most common type of system. It is a sprinkler system employing automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened by heat from a fire.
- **Antifreeze System –** Antifreeze systems are used in spaces where the ambient temperature may be cold enough to freeze the water in a wet pipe system. This system employs automatic sprinklers attached to a piping system containing an antifreeze solution. The antifreeze solution is discharged, followed by water, immediately upon operation of sprinklers opened by heat from a fire.
- **Pre-action System -** A pre-action system is used in locations where accidental activation is undesired, such as in museums or collection spaces housing valuable or historic artifacts. This type of system employs automatic sprinklers attached to a piping system that contains air that might or might not be under pressure. This type of system employs the use of additional detection devices such as smoke or heat detectors which have to activate within the same areas as the sprinklers. When the supplemental heat or smoke detector activates, the pre-action valve will open and allow water to flow into the piping. Water will not flow from the sprinklers until a fire has generated enough heat to open one or more sprinklers.

Each of the types of fire suppression systems requires some form of inspection, testing and maintenance. The following outlines a typical schedule of inspection, testing and maintenance:

- **Monthly -** Control valves, alarm valves, and pressure gauges should be inspected, tested, and maintained monthly. Control valves should have the appropriate identification and wrench, be accessible, and be locked in the open position or electronically supervised during inspection. Pressure gauges should show that normal water supply pressure is being maintained.
- **Quarterly -** The fire department connection (FDC), water flow/supervisory signal devices, and alarm devices should be inspected, tested, and maintained quarterly. The FDC should be visible and accessible and identification signs and caps should be in place.
- **Annually-** Sprinklers, pipe and fittings, hangers and any seismic braces, and spare sprinklers should be inspected, tested, and maintained annually. Sprinkler heads should be installed in the proper orientation (e.g., upright, pendant, or sidewall); not show signs of leakage; and should be free of corrosion, foreign materials, paint, and physical damage.
- **Additional Testing and Maintenance -** There are specific requirements for the testing and maintenance of

the valve and device components of sprinkler systems that should be done quarterly, semiannually, and annually. Fire sprinkler system service contractors are usually contracted to perform these services. Mechanical water flow devices, including but not limited to water motor gongs should be tested quarterly. Vane-type or pressure switch-type water flow devices should be tested semiannually.

Additional fire and smoke systems are available which are considered Early Warning Systems. One such system utilizes air sampling and is referenced by the name of "VESDA" which stands for "Very Early Warning Aspirating Smoke Detection". The VESDA system is designed to alarm the occupants to a danger as soon as possible. The VESDA air sampling fire detection system detects invisible by-products of materials as they degrade during the pre-combustion stages of a developing fire. By actively and continuously sampling air, the system operates independently of air movements. Air samples are continuously drawn from the monitored environment, typically through a sampling pipe network with the aid of a high efficiency aspirator. The air samples pass through a filter assembly to screen out large airborne dust particles before they reach the air-sampling detector. Once inside the air-sampling detector, the samples are exposed to a high-intensity, broad-spectrum light source. The incident light scattered from smoke particles in the air sample passes through a series of optical components to a solid state light receiver. The light is converted to an electronic signal and passed to the control system. At the control module, the signal is processed and presented on a graph to visually indicate the level of smoke present in the monitored area. Depending upon smoke levels and the preprogrammed alarm levels, the appropriate output signals are generated. The first of three staged alarm levels (ALERT) may simply indicate that the system has detected something out of the ordinary that should be investigated. The second level (ACTION) indicates that a potential fire exists and that emergency procedures should begin. The third level (FIRE) signifies an actual fire condition.

Early warning systems such as the VESDA system should be considered when aesthetics in the space are of utmost importance or when reducing the risk of vandalism. Many areas that cause environmental issues to conventional detection where an early warning system can offer a suitable solution while avoiding false alarm and reducing maintenance demands. Areas with high temperatures, cold areas, areas with high humidity, dusty areas, are areas where VESDA can be of an advantage. VESDA systems have been used in combination with other extinguishing systems where a conventional water based system may cause damage on a sprinkler head discharge. The VESDA system can be used in combination with conventional fire suppression systems as an early warning system which signal a warning before a fire grows to a level that a sprinkler system needs to be activated. Another combination includes the use of a VESDA system in combination with systems utilizing chemical agents such FM 200 which uses hydrofluorocarbons used to fight the fire. VESDA with systems using gaseous agent systems such as Inergen which is a mixture of nitrogen, argon and carbon dioxide, smothers the fire. Chemical agent and gaseous agent systems are typically used in locations where water damage would be most critical. Chemical agents when used in such critical spaces such as data centers and mission critical facilities can damage computer systems while gaseous agents work very well for this application.

## FIRE SERVICE

Any added automatic fire suppression system for the Bauvais-Amoureux House will require a separate fire water service to be installed to the building. This water service will be in addition to any existing potable water service to the building serving domestic water needs. The fire service size anticipated would need to be a minimum 4" in size with the water service provided with a post indicator valve near the street giving the fire department visual indication of whether the fire service is active or is inactive due to maintenance.

The fire service to the House should enter the building in a heated space or room. At the Bauvais-Amoureux House, it is recommended that an insulated chase from below grade to inside the building be provided protecting the fire service from freezing. A room inside the building will be needed to house the fire entrance assembly. Ample space will be needed for the fire entrance assembly including backflow preventers, valves, drain and test connections, and an air compressor to keep the piping system charged with air.

A fire department connection or FDC will also be needed allowing the local fire department to connect their water supply to the building fire suppression system if the main fire service is down for serving or maintenance. The FDC would generally be located 40-feet or more from the building for safety of the fire fighters.

# HVAC CONSIDERATIONS COMMON TO ALL ALTERNATIVES

## A SHORT HISTORY OF RESIDENTIAL HVAC SYSTEMS

In the 18th century, early heating and ventilation relied upon common sense methods of managing the environment. Builders purposely sited houses to capture winter sun and prevailing summer tcross breezes; they chose materials that could help protect the inhabitants from the elements, and took precautions against precipitation and damaging drainage patterns. The location and sizes of windows, doors, porches or galleries, and the floor plan itself often evolved to maximize ventilation. Heating was primarily from fireplaces or stoves. Thermal insulation was rudimentary, such as wattle and daub, brick nogging or infill like bousillage or pierrotage.

By the 19th century, residential designs of the period often used gravity hot air systems utilizing floor and ceiling grilles. The technology of the age, however, was not sufficient to produce "tight" buildings in terms of air communication between interior and exterior conditions, and there was still only a moderate difference between internal and external temperatures. This was due, in part, to the limitations of early insulation, the almost exclusive use of single glazed windows, and the absence of airtight construction. The presence of ventilating fans and the reliance on architectural features, such as operable windows, cupolas and transoms, allowed sufficient air movement to keep buildings well ventilated, and allowed building materials to behave in a fairly traditional way, expanding and contracting with the seasons.

The 20th century saw development of new technologies and the notion of fully integrating mechanical systems. Gas furnaces developed in the 19th century were improved and made more efficient, with electricity becoming the critical source of power for building systems in the latter half of the century. Forced air heating systems with ducts and registers became popular for all types of buildings. The insulating qualities of building materials improved. Synthetic materials, such as spun fiberglass batt insulation, were fully developed by mid-century. Prototypes of insulated thermal glazing and integral storm window systems were promoted in construction journals. Caulking to seal out perimeter air around window and door openings became a standard construction detail.

The last quarter of the 20th century has seen making HVAC systems more energy efficient and better integrated. The use of vapor retarders to control moisture migration, air barriers to control air migration, thermally efficient windows, caulking and gaskets, compressed thin wall insulation, and other high performance practices have become standard. New integrated systems now combine interior climate control with fire suppression, lighting, air filtration, temperature and humidity control, and security detection. Computers regulate the performance of these integrated systems based on the time of day, day of the week, occupancy, and outside ambient temperature.

Although 20th century mechanical systems technology has had a tremendous impact on making historic buildings comfortable, the introduction of these new systems in older buildings is not without problems. The attempt to meet and maintain modern climate control standards may actually damage historic resources. Modern systems are often over-designed to compensate for inherent inefficiencies of some historic buildings materials and plan layouts. Energy retrofit measures, such as installing exterior wall insulation and vapor retarders or the sealing of operable windows and vents, ultimately affect the performance and can reduce the life of aging historic materials.

In general, the greater the differential between the interior and exterior temperature and humidity levels, the greater the potential for damage. As natural vapor pressure moves moisture from a warm area to a colder, dryer area, condensation will occur on or in building materials in the colder area. Too little humidity in winter, for example, can dry and crack historic wood or painted surfaces. Too much humidity in winter causes moisture to collect on cold surfaces, such as windows, or to migrate into walls. As a result, this condensation deteriorates wood or metal windows and causes rotting of walls and wooden structural elements. Condensation can also cause wetting of buildings with insulation which holds moisture against exterior surfaces. Moisture migration through walls can cause the corrosion of metal anchors, angles, nails or wire lath, can blister and peel exterior paint, or can leave efflorescence and salt deposits on exterior masonry. In cold climates, freeze-thaw damage can result from excessive moisture in external walls. Therefore, improvements to the building envelope should not be performed without careful consideration and analysis of the impact to the structure and materials. Undesired and unanticipated effects of poorly considered envelope improvements can be more detrimental to the building more so than any benefit they may provide.

It is assumed that the Bauvais-Amoureux House will not be a full-time occupied building and will be open to limited

tours. Due to its limited occupancy, maintaining occupant comfort would be considered less critical and the approach to preservation of the historic materials and techniques used to construct the House should take precedence. Maintaining the building in its current state with no vapor retarder and little if any insulation will allow for a relatively small difference between internal and external temperatures and relative humidity. This is similar to how this building has performed for much of its life as a private residence before modern HVAC systems. Reducing swings in temperature and humidity will allow the building materials to naturally expand and contract with the seasons. Providing a "low-tech" approach for this building through limited heating and improved ventilation may offer the best preservation approach for the interior environment and building structure. The benefits of providing heat to the building interior will protect any water utility entrance for fire suppression, and providing improved ventilation will create a more tolerant and consistent environment for visitors touring the building by moving air throughout the building.

If the NPS goal is to implement a strategy of Rehabilitation such as, a museum setting, upgrading the building to support the proposed use would need to be addressed. The building envelope would require the addition of air sealing, vapor retarders, and insulation at walls, floors, and the roof or attic. To use the building in its current condition would not be possible if some form of museum environment were desired. Extensive demolition or alteration of wall, floor, and roof finishes would be required to maintain the interior environmental conditions at a level appropriate for sensitive collections. Museum collections typically need to reside in a stable environment for both temperature and relative humidity levels.

## ENVIRONMENTAL CONSIDERATIONS

In order to design environments suitable for the storage of collectable materials, it is best to understand that many factors with the environment can impact any collections, artifacts, and documents within the space. This section is included for reference, and the classification of the building and systems will be determined for each alternative.

The factors within the environment are as follows:

### Biological Damage

Higher temperatures and higher humidity levels support biological activity. Accelerated mold growth, corrosion of base materials, and chemical deterioration can result in most organic materials.

### Mechanical Damage

Very low relative humidity levels, temperatures or high fluctuations of relative humidity and temperature can lead to mechanical damage. This can be caused by the expansion and contraction of materials. Very low relative humidity levels or very low temperatures increase the stiffness of organic materials making them vulnerable to fracture.

### Light

All wavelengths of light are damaging to archival materials. Ultraviolet light, wavelengths less than 400- nanometers, can cause the most extensive damage. Over exposure to light can cause photochemical or photophysical damage to collections and is dependent upon the intensity, the type of light, and the duration of exposure. Since light damage is cumulative, light exposure levels are measured by calculating total exposure. Total exposure is the product of intensity of the source multiplied by the duration of exposure.

### Chemical Damage

Elevated temperatures and increased relative humidity levels are also a cause of chemical damage. Archival records, such as papers, photographic negatives, and magnetic media, are the most susceptible to the chemical damage.

### Airborne Pollutants

Fine particles and gaseous pollutants can lead to deterioration of collections. Sources of pollutants include outside air, building materials, occupants, maintenance practices. Gaseous pollutants react with the moisture in paper and the moisture in the air to produce acids which speed up the rate of paper deterioration and can lead to embrittlement. Airborne particulates can abrade, disfigure and obscure test in addition to increasing the potential for the presence of mold spores.

## CLASSIFICATIONS FOR COLLECTION STORAGE ENVIRONMENTS

ASHRAE, recognizes six primary classes of control for general museum, art galleries, libraries and archives spaces. Chapter 21 of the 2003 ASHRAE HVAC Applications Handbook, describes a minimum of six levels of control for maintaining the building and any possible collections which may be stored or put on display should this be a desire of NPS. The six levels of control are Types AA, A, B, C, and D. The outlined levels of control vary from AA, which includes precision control allowing for no seasonal changes, to D, which is limited to preventing dampness. ASHRAE

describes Type A as the optimum for most museums and galleries, based on the goal of providing a balance between risks and benefits. Type AA level of control may be pursued if even greater control and less risk are desirable.

The ASHRAE Table 4 provides a valuable analysis for buildings that will not or are not capable of adhering to the precise controls of Level AA. The table clearly identifies the level of risks in terms of both mechanical and chemical damage to collections being stored in environments such as A, B, C, or D, in comparison to the more precise Levels AA.

The building envelope is a critical element in determining possible classes of fluctuation control in a particular building. ASHRAE considers the typical building construction, typical type of building, typical building use, and the HVAC system used to determine the practical limit of climate control. The building classes recognized by ASHRAE are Classes I, II, III, IV, V, and VI. The building classes are subdivided into categories of control. Classes I and II are considered uncontrolled; Classes III and IV are partial control; Classes V and VI are climate controlled. The following is a summary of these classifications:

### UNCONTROLLED

**Building Class I –** buildings contain no mechanical devices; thus, the environmental conditions inside the spaces are approximately equal to the outdoor conditions.

**Building Class II –** buildings consist of ventilation only in the form of exhaust fans, open windows, supply fans, or attic venting, high temperatures and relative humidity gradients can be anticipated.

### PARTIALLY CONTROLLED

**Building Class III –** buildings utilize heating and ventilating to control temperature fluctuations, high humidity conditions can be anticipated.

**Building Class IV –** buildings utilize basic HVAC systems capable of heating, cooling, limited humidification, and limited dehumidification. Temperature fluctuations of 15° F and relative humidity fluctuations of 30% could be anticipated.

### CLIMATE CONTROLLED

**Building Class V –** buildings utilize more precise HVAC systems capable of heating, cooling, humidification, and dehumidification. Often operate with seasonal drift to limit operating costs or to protect the building envelope. Additional characteristics may include well-insulated or double glazed windows, vapor barriers, and double doors or airlocks.

**Building Class VI –** buildings utilize mechanical systems designed with precise controls to provide a relatively constant environment. The components are specifically designed to accommodate the specialized environment. Both construction costs and operating costs are typically high.

### VENTILATION AIR AND VENTILATION AIR QUANTITY

Any new heating, ventilating and air conditioning systems will need to provide some form of outside air for ventilation. Outside air may be introduced to the building either by natural means or by mechanical means depending on the availability of openings used for air introduction.

In a natural method, outside air can be introduced through operable windows, as long as natural ventilation can be achieved within a certain distance of the building perimeter and there is no treatment needed to the outside air, such as filtration. Outside air can also be introduced through an existing chase or building opening such as a lined chimney.

With mechanical ventilation, fans are used to introduce outside air directly into a space or by removing air from a space. This includes the use of positive pressure ventilation, negative exhaust ventilation, and balanced systems that use both supply and exhaust ventilation.

With mechanical ventilation systems, energy codes often mandate the use of some form of energy recovery method to precondition outside air before its introduction into the building HVAC system. Energy recovery ventilators (ERV) offer a means for this pre-treatment of outside air by passing building exhaust air from the building through an internal energy recovery device. The use of an ERV reduces the conditioning load that the outside air imposes on the HVAC system equipment which in turn reduces energy consumption to heat or cool the indoor space.

Outside air to be used for ventilation will need to be introduced in quantities as dictated by the International Mechanical Code and ASHRAE. ASHRAE Standard 62.1 – *Ventilation for Acceptable Indoor Air Quality* lists the required ventilation air required for various types of commercial buildings and occupancies. If the building is classified as a residential property, ASHRAE Standard 62.2 *Ventilation and Acceptable Indoor Air Quality in Residential Buildings* would be used to determine the ventilation requirements. ASHRAE mandates specific amounts of outside air required for ventilation based on the number of occupants and the number of square feet of occupied space based on a particular building usage.

### ENERGY EFFICIENCY

Energy code requirements dictate system equipment energy efficiencies to ensure the building operates in compliance with the energy code utilizing the least amount of energy, decreasing greenhouse gas emissions and pollution and by increasing economic and environmental sustainability while lessening peak energy demand, increasing utility reliability and improving indoor air quality.

Generally, the HVAC system equipment options would need to meet minimum energy code efficiencies in the State of Missouri. However, since this building is on the National Register of Historic Places, it is exempt from the energy code requirements. Under the *Secretary of Interior's Standards for Historic Structures*, guidelines exist for restoration, preservation, reconstruction and rehabilitation of historic and significant buildings which apply to the incorporation of new building systems. Any added HVAC system will be selected and sized to be as compliant as reasonably possible with the energy codes while imposing minimal impact on the historic features and fabric of the building.

Equipment used for cooling can include exterior-located condensing units and heat pumps. They will need to be provided with a seasonal energy efficiency rating (SEER) minimum of SEER 14, or in the case of the heat pumps, a heating seasonal performance factor (HSPF) minimum of HSPF 8.2. For an indoor furnace unit, it will need to be provided with a thermal heating efficiency rating of a minimum annual fuel efficiency rating (AFUE) of 90% if the unit were to be gas-fired. To achieve this heating efficiency, any gas-fired furnace will have to be a condensing-type of furnace. This type of furnace has two heat exchangers. One heat exchanger is used similar to a standard efficiency furnace where fuel combusts creating heat, water vapor and combustion byproducts. The water vapor and combustion byproducts would normally go up a flue pipe and be exhausted to the outdoors on a standard furnace where the system fails to capture approximately 20% of the heat produced. With a high-efficiency furnace, a second heat exchanger allows the water vapor to condense into a liquid. In this process of transforming water vapor to condensate, the liquid releases heat which the furnace recycles and uses to warm the air. By utilizing the waste heat which would normally escape up the flue, the furnace operates more efficiently which in turn costs less to operate. Another alternative to gas-fired equipment would be the use of electric heat as a heating option. If electric heat were desired, the existing electrical service will need to be reviewed to make sure it can accommodate the increased electrical load placed on it by an electrical coil at a furnace unit.

### MECHANICAL AND ELECTRICAL SPACE

Simplicity, maintenance, access to equipment, and installation are things to consider when providing a heating, ventilation and air conditioning system. As it is assumed this building will not be manned full-time, providing a system which requires reduced maintenance and supervision will be important. Providing an enclosed and conditioned mechanical space for the equipment with adequate clearance for access, along with room for the other building systems such as fire suppression and electrical services, will be important. Since the Bauvais-Amoureux House will be assumed to be a non-occupied building in the future, it is recommended that the existing restroom plumbing fixtures be removed and the restroom be repurposed as a mechanical/electrical space as the electrical service currently exists at this room. The room can be configured to accommodate the fire suppression system and mechanical equipment to be located in this room as well *(Reference Appendix E for drawing M-1 for a floor plan indicating the proposed layout for mechanical/electrical space).*

## HEATING, VENTILATING, AND AIR-CONDITIONING OPTIONS

Providing an HVAC system without some form of cooling and dehumidification capabilities would not be recommended as this building will serve occupants present during building tours. Providing cooling and dehumidification during the summer months will provide an indoor environment with more stable temperature and humidity levels when compared to the existing conditions thus limiting the large swings currently experienced. As upgrading the building envelope may not be the best course of action due primarily to the destructive nature to the building facade and interior surfaces, consideration to the building's existing envelope will need to be taken into account when selecting the HVAC system capacity.

To provide a building environment addressing both preservation and rehabilitation, controlling any rapid offsets or swings in temperature and humidity should be taken into consideration. Incorporation of mechanical cooling and dehumidification should address these concerns. One option is to provide mechanical cooling and dehumidification utilizing direct expansion cooling where a cooling coil is used as part of the HVAC system coupled with an exterior-located, air-cooled condensing unit for heat rejection. The resultant indoor temperature and humidity levels during the summer months can be kept at more desirable levels.

An add-on humidifier to the central HVAC system can be included to provide additional moisture within the building during the drier winter months to help maintain a more stable indoor relative humidity. The indoor temperature and humidity level goals should be approximately 68-72 degrees fahrenheit with 25-35% relative humidity during the winter and 72-75 degrees fahrenheit with 50% relative humidity during the summer months. These conditions will provide a relatively stable environment addressing both preservation and rehabilitation goals. The system equipment capacities will need to take into consideration the existing structure's floor, wall and roof compositions and R-values along with expected infiltration rates due to building leakage.

Location of an air-cooled condensing unit will need to be reviewed with any building exterior improvements with regard to site and landscaping. To maintain adequate airflow and prevent air short-cycling, locating the condensing unit below the north gallery is not recommended. Providing a location which offers adequate maintenance clearance and code required access to the unit's electrical disconnect switch will be required.

It would be recommended that any new HVAC equipment be located in a mechanical space at the main level of the House and not in the caveau or grenier as access to these two spaces may be difficult. The caveau has limited head room and this space has been subject to flood waters in the past. The grenier access can only be made via the south gallery stairway which is steep and narrow and does not provide safe access *(Re: Photograph M-30)*. Utilizing the existing restroom at the west end of the north gallery is recommended for housing the new HVAC equipment as this room can be easily converted to a mechanical and electrical room. The room will need to be large enough to provide the code required clearance spaces and maintenance clearance space. Limited building insulation will be needed to allow for tempering of this space to protect the fire water entrance from freezing. If the mechanical system involves any distribution ductwork, it is recommended that ductwork be installed at the grenier above. Access to the grenier would not need to be made very often to maintain ducts.

## HVAC ALTERNATIVES CONSIDERED BUT NOT SELECTED

### OPTION #2 – FURNACE SYSTEM WITH NATURAL GAS HEAT

Similar to the electric version of this system, natural gas heat can be provided as the heating energy source if natural gas is desired over electricity. Equipment would have a natural gas-fired heat exchanger included with the vertical furnace in lieu of an electric heating coil. Ductwork distribution and ventilation air would be handled similarly to the electric option with ductwork located up in the grenier and an ERV located in the mechanical space.

**Gas-Fired Furnace System – Advantages**

- Simple system to control and operate
- Relatively inexpensive to replace should equipment breakdown or wear out
- Furnace relative small physical size making them easy to mount in the grenier space
- Lowest first cost compared to other more sophisticated systems such as air handling units and boilers
- Similar to the electric furnace option, if cooling is desired, the gas-fired furnace can be provided with a refrigerant cooling coil with refrigerant piping connected to an exterior air cooled condensing or heat pump.
- Humidification can be added to enhance environmental conditions
- Allows an energy recovery unit for ventilation to be easily ducted to the furnace system
- Can provide a Building Class IV with a Type B Class of Control
- With a proper vapor barrier and added insulation, temperature and humidity levels should be able to maintained at 72°F and 50% RH in the summer and 68°F and 30% RH in the winter with a drift of approximately 10°F and 10% RH

**Gas-Fired Furnace System – Disadvantages**

- Requires periodic maintenance for equipment similar to standard residential equipment
- Requires that a flue and combustion air pipe be run to the roof or through the west wall to serve the furnace system
- Allows for ductwork to route in the grenier space providing a less intrusive means of air distribution

- If heat pumps are utilized over condensing units, heat pumps have a slightly higher first cost
- A single thermostat providing only a single zone of control of the furnace system
- Limited capability to providing enhanced environmental control
- If heat pumps are utilized over condensing units, heat pumps have a slightly higher first cost

**OPTION #3 – GEOTHERMAL HEAT PUMP SYSTEM**

A third option for providing heat and/or cooling to the House could include a geothermal heat pump system. The geothermal system is a hydronic system which utilizes a series of exterior vertical wells for heat injection during the winter and heat rejection during the summer. The wells would be filled with thermally conductive grout with a piping loop associated with each well. The system utilizes a distribution pump which pumps water to and from the indoor heat pump to the exterior wells and back. This system option would require that a conductivity test be performed prior to design to determine the ground conditions and its ability to conduct or absorb heat. This test also helps determine the depth and number of wells needed.

The indoor water source heat pump can be located in a mechanical room with the grenier used duct distribution system similar to furnace options. Similar to the furnace options, the geothermal heat pump system can easily incorporate the addition of an energy recovery ventilator into its duct system for introduction of preconditioned outside air for ventilation.

The geothermal heat pump system may require a slightly larger mechanical room for housing the distribution pump and other hydronic system specialties such as water treatment equipment, hydronic expansion tank and air control equipment.

A single wall-mounted, central thermostat would provide system control and temperature monitoring. Unless multiple heat pumps were provided, only one zone of control would be present. System heating or cooling would be controlled through the central control thermostat.

**Geothermal Heat Pump System – Advantages**

- Reduced energy consumption as heating and cooling of the loop water is provided by the ground loop heat exchanger versus mechanical heating and cooling
- Lower cost to operate when compared to alternative system using natural gas for heating and electricity for heating as the ground provides the means for heat injection and heat rejection
- Humidification can be added to enhance environmental conditions for critical areas
- Allows an energy recovery unit to be easily ducted similar to the furnace systems
- Can provide a Building Class IV with a Type B Class of Control

**Geothermal Heat Pump System – Disadvantages**

- May require a slightly larger mechanical space to House heat pump and water loop equipment
- Requires more sophisticated controls for water loop equipment control
- Highest first cost when compared to furnace system primarily due to cost of drilling the vertical borings and added piping system associated with the exterior well field
- Requires water treatment for the loop piping system
- Requires make-up water for the loop piping system should the piping system need draining or experience a leak
- May require an additional small boiler for adding heat to the loop piping system during prolonged periods of cold weather

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**ADDITIONAL COLLECTIONS AND SOURCES CONSULTED:**

Mercantile Library at St. Louis University

Ste. Genevieve Archive in the Missouri State Historical Society

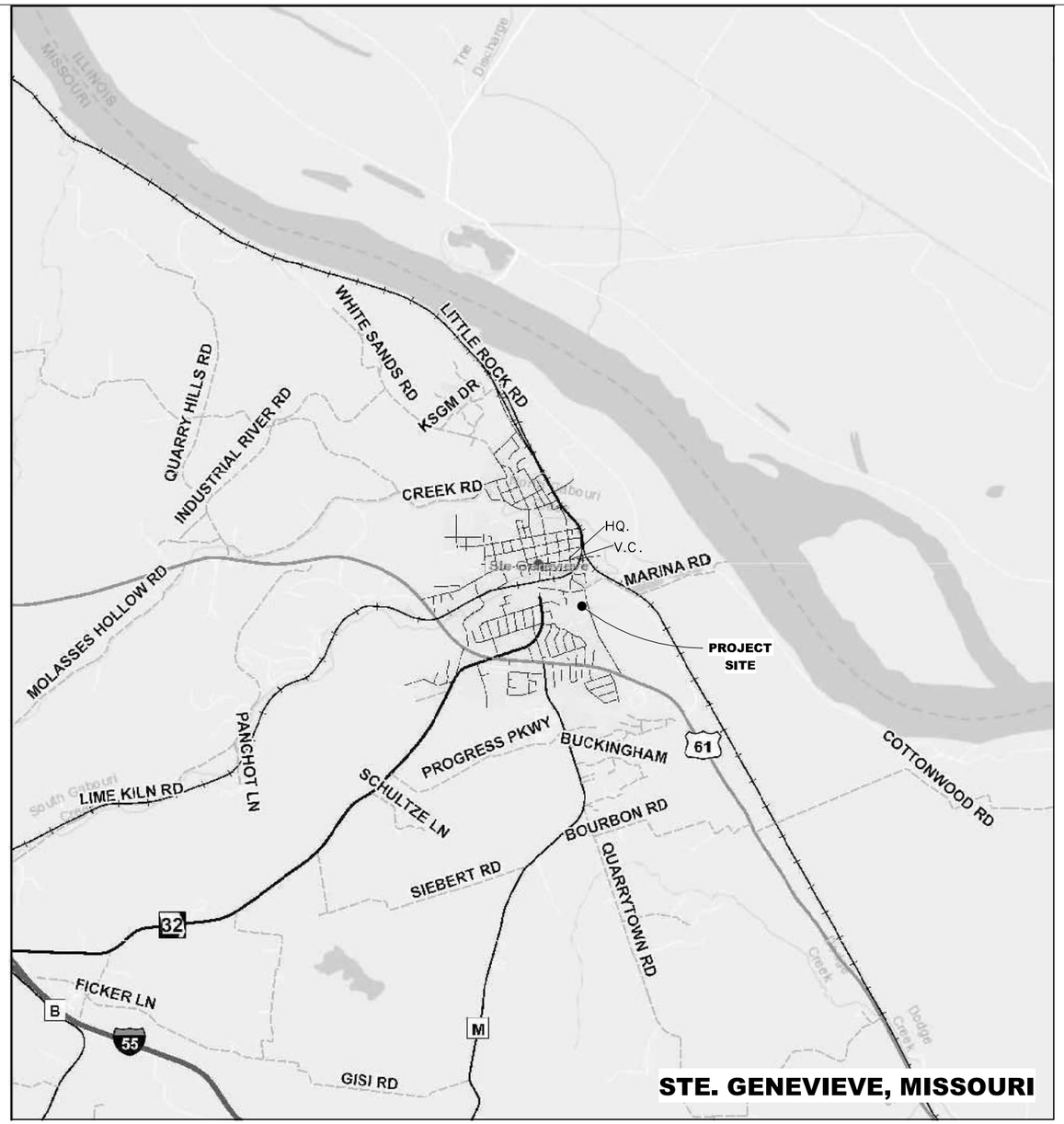
Ste. Genevieve County Courthouse

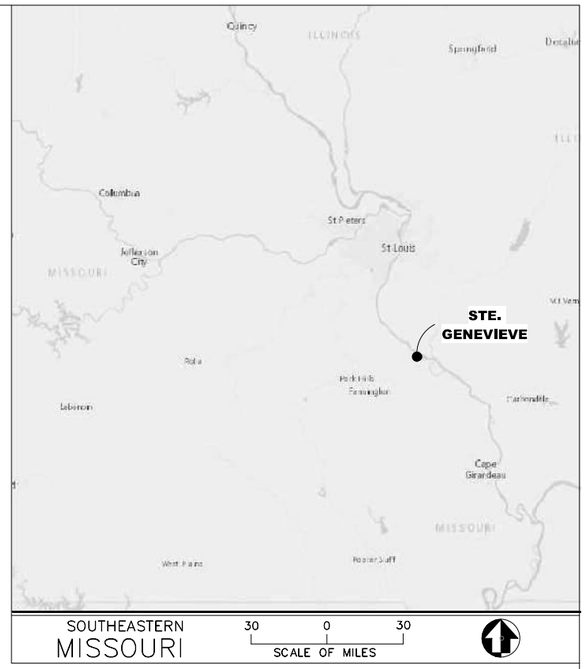
Felix Vallé House State Historic Site

National Park Service Website Files

Various Family Records and Collections

# Appendix A - Existing Condition Drawings




LEGEND

| | |
|---|---|
| V.C. | VISITOR CENTER |
| HQ. | PARK HEADQUARTERS |

**BVH NOTE:**

**THE DRAWINGS SHOWN WERE CREATED BASED ON LIMITED FIELD VERIFICATION. PRIOR DWGS CONSULTED WERE:**
- **THE 1956 HABS**
- **THE 1994 "STABILIZATION OF THE AMOUREAX HOUSE"**

**DWGS ARE TO BE USED FOR GENERAL SCALE, MASSING AND CONFIGURATION PURPOSES ONLY.**

SCALE OF MILES
1 0 1
1 0 1
SCALE OF KILOMETERS

# STE. GENEVIEVE NATIONAL HISTORICAL PARK

| Mark | Sheet | REVISION | Date | Initial |
|---|---|---|---|---|
| | | | | |

QUALITY DESIGN CERTIFICATION
- ☐ Prepared in Accordance with Design Development (Title I) _____ OR
- ☐ Variance from Design Development (Title I) Approved by Superintendent on _____ OR
- ☐ Construction Drawing Not Preceded by Design Development (Title I)

Project Manager _____ Date _____

UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE
DENVER SERVICE CENTER

HISTORIC STRUCTURE REPORT
BAUVAIS-AMOUREUX HOUSE

STE. GENEVIEVE NATIONAL HISTORICAL PARK

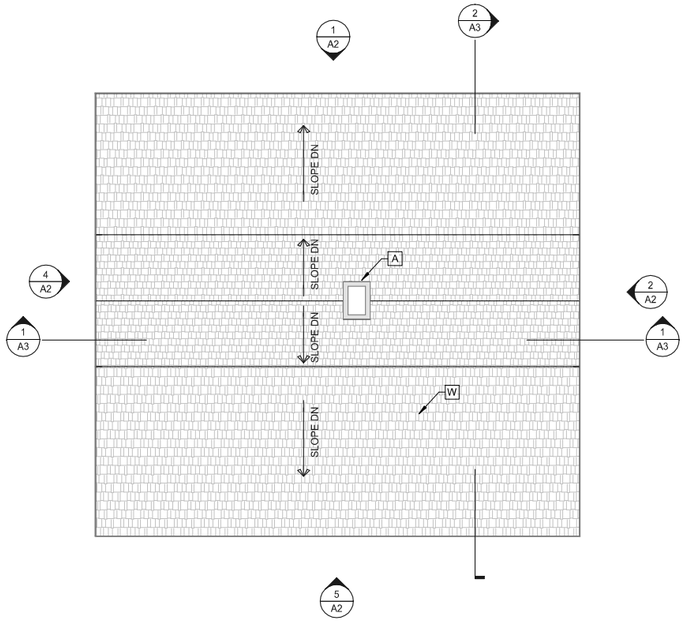
REGION MIDWEST | COUNTY STE. GENEVIEVE COUNTY | STATE MISSOURI

DRAWING NO. _____

PKG. NO. _____

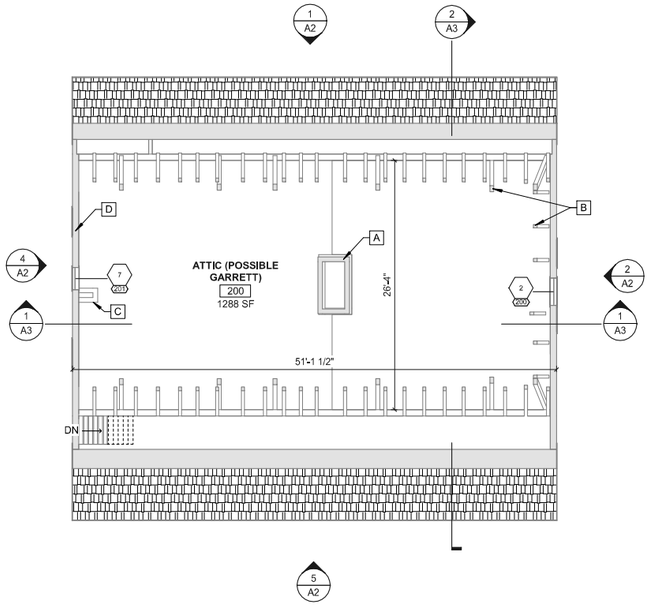
SHEET 1 OF 6

BASIC DATA: 9/21/2021 6:19:26 PM BHEIDE BIM 360://20062 – NPS Bauvais Amoureux House HSR/20062 NPS Bauvais Amoureux House HSR_AM.rvt




4 EXISTING ROOF PLAN

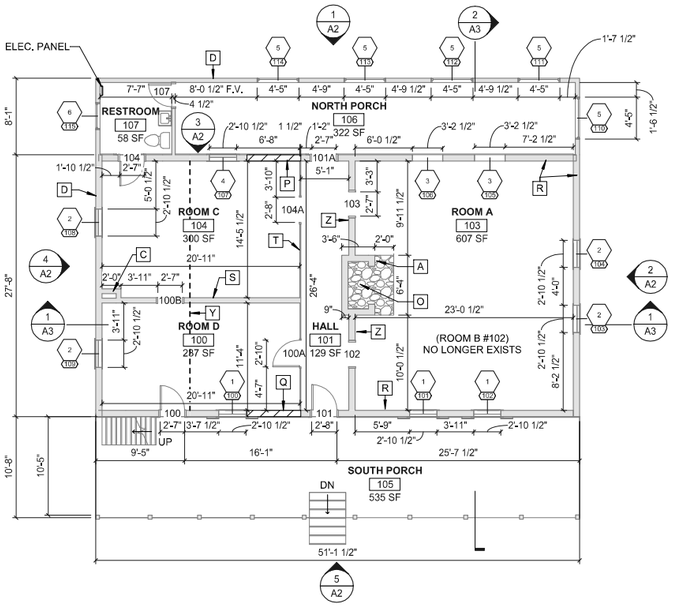
1/8" = 1'-0"




STONE CHIMNEY

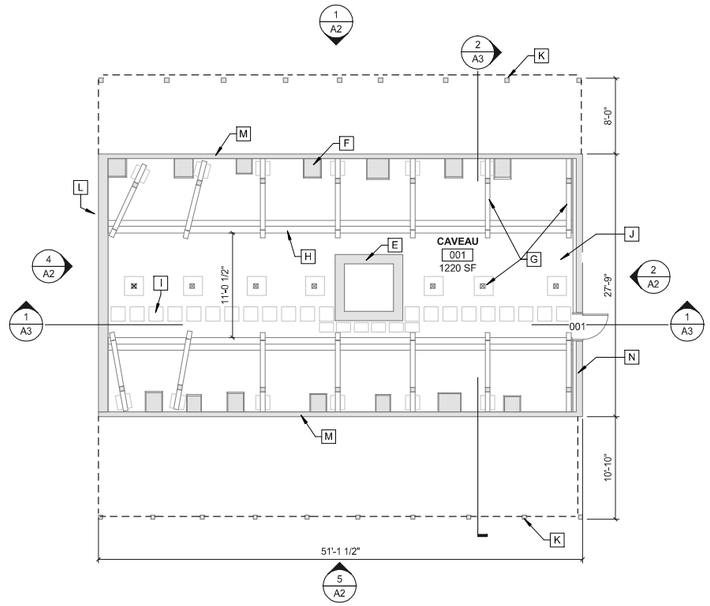
3 EXISTING ATTIC (POSSIBLE GARRET) FLOOR PLAN

1/8" = 1'-0"




2 EXISTING FIRST FLOOR PLAN

1/8" = 1'-0"




1 EXISTING LOWER LEVEL CAVEAU PLAN

1/8" = 1'-0"

## NOTE LIST

0'-1/4"

A. STONE CHIMNEY
B. TIMBER FRAMING ELEMENTS
C. REMNANTS OF REMOVED BRICK CHIMNEY, CUT OFF AT ATTIC FLOOR LEVEL
D. 2X WOOD FRAMING

E. STONE CHIMNEY FOUNDATION
F. STONE PIER
G. 1994 WOOD SHORING SYSTEM THRU-OUT
H. 1994 BULKHEAD RETAINING WALL
I. DIRT FLOOR AND STONE STEPPING STONES
J. SUMP PUMP AND PIT
K. GALERIE FRAMING
L. WEST WALL STONE FOUNDATION
M. NORTH AND SOUTH VERTICAL LOG WALLS
N. EAST WALL VERTICAL LOGS RESTING ON STONE FOUNDATION

O. STONE HEARTH
P. 1792 DOOR FRAMING, INFILLED WITH VERTICAL LOGS.
Q. 1792 DOOR FRAMING NOTED BY OTHERS DURING PRIOR ASSESSMENT
R. PALISADED LOG WALL
S. WOOD AND PLASTER PARTITION
T. WOOD PARTITION

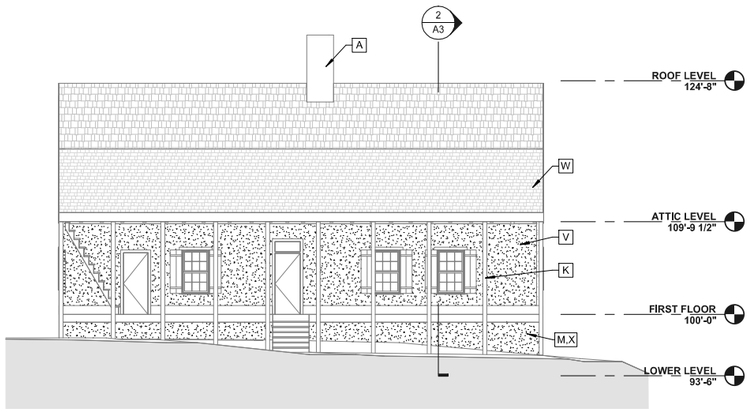
U. WOOD LAP SIDING
V. PLASTER WITH LIME WASH
W. WOOD SHAKE ROOFING
X. CLAY PARGING
Y. LIKELY ORIGINAL LOCATION OF NOW MISSING VERTICAL LOG WALL
Z. INTERIOR VERTICAL LOG WALL

**BVH NOTE:**

**THE DRAWINGS SHOWN WERE CREATED BASED ON LIMITED FIELD VERIFICATION. PRIOR DWGS CONSULTED WERE:**
- **THE 1956 HABS**
- **THE 1994 "STABILIZATION OF THE AMOUREAX HOUSE"**

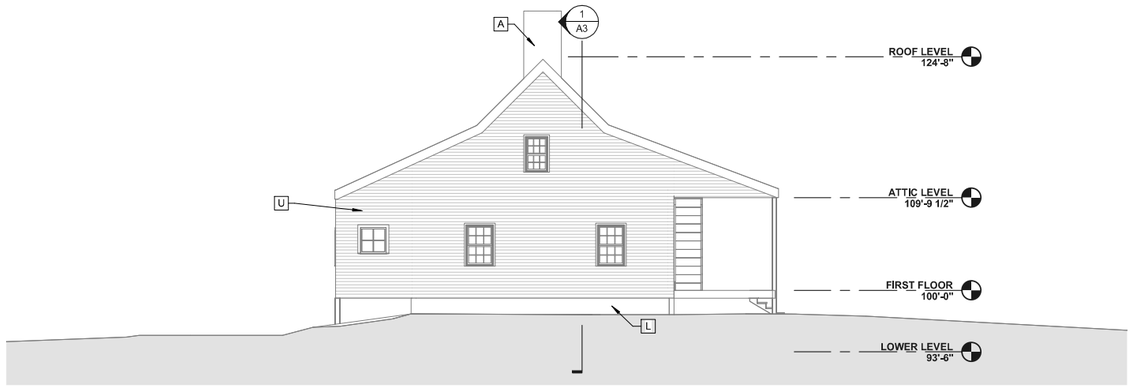
**DWGS ARE TO BE USED FOR GENERAL SCALE, MASSING AND CONFIGURATION PURPOSES ONLY.**

| | | | | |
|---|---|---|---|---|
| | DESIGNED: JCAWBY<br>CADD BHEIDE<br>TECH. REVIEW:<br>DATE: 09/24/2021 | SUB SHEET NO. A1 | TITLE OF SHEET<br>EXISTING FLOOR PLANS & ROOF PLAN<br>STE. GENEVIEVE NATIONAL HISTORICAL PARK | DRAWING NO.<br>PKG. NO.<br>SHEET 2 OF 6 |



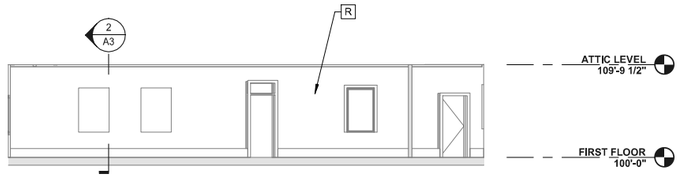

5 EXISTING SOUTH ELEVATION

1/8" = 1'-0"



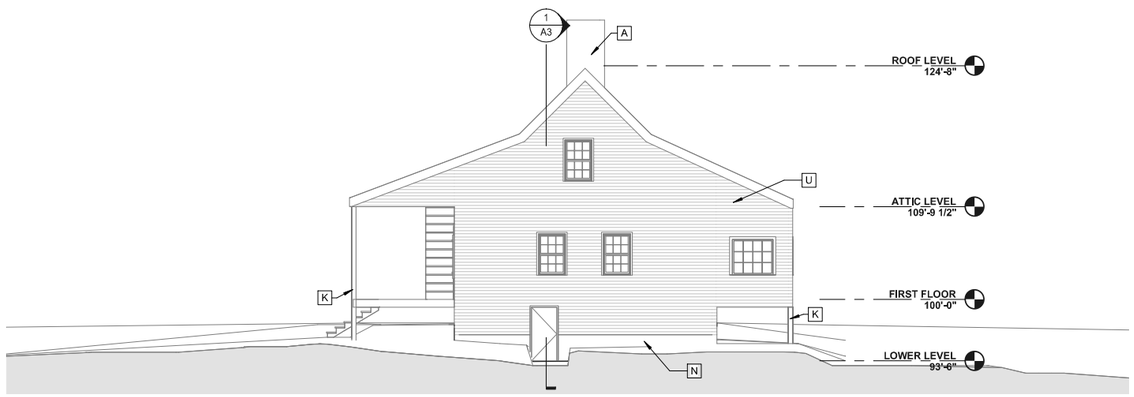

4 EXISTING WEST ELEVATION

1/8" = 1'-0"



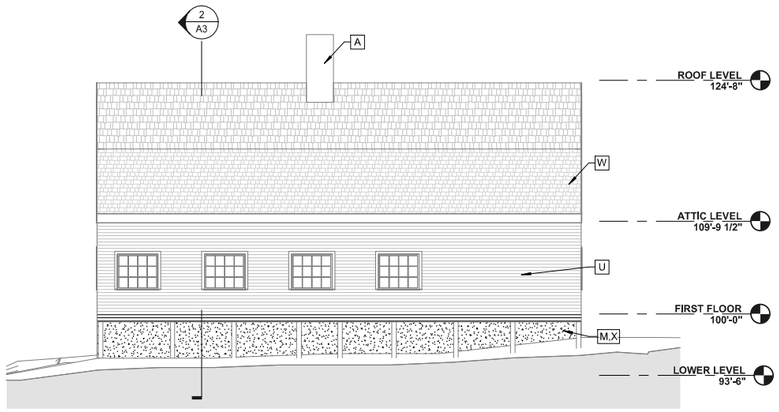

3 EXISTING NORTH ELEVATION - INT. PORCH

1/8" = 1'-0"




2 EXISTING EAST ELEVATION

1/8" = 1'-0"




1 EXISTING NORTH ELEVATION

1/8" = 1'-0"

## NOTE LIST

A. STONE CHIMNEY
B. TIMBER FRAMING ELEMENTS
C. REMNANTS OF REMOVED BRICK CHIMNEY, CUT OFF AT ATTIC FLOOR LEVEL
D. 2X WOOD FRAMING

E. STONE CHIMNEY FOUNDATION
F. STONE PIER
G. 1994 WOOD SHORING SYSTEM THRU-OUT
H. 1994 BULKHEAD RETAINING WALL
I. DIRT FLOOR AND STONE STEPPING STONES
J. SUMP PUMP AND PIT
K. GALERIE FRAMING
L. WEST WALL STONE FOUNDATION
M. NORTH AND SOUTH VERTICAL LOG WALLS
N. EAST WALL VERTICAL LOGS RESTING ON STONE FOUNDATION

O. STONE HEARTH
P. 1792 DOOR FRAMING, INFILLED WITH VERTICAL LOGS.
Q. 1792 DOOR FRAMING NOTED BY OTHERS DURING PRIOR ASSESSMENT
R. PALISADED LOG WALL
S. WOOD AND PLASTER PARTITION
T. WOOD PARTITION

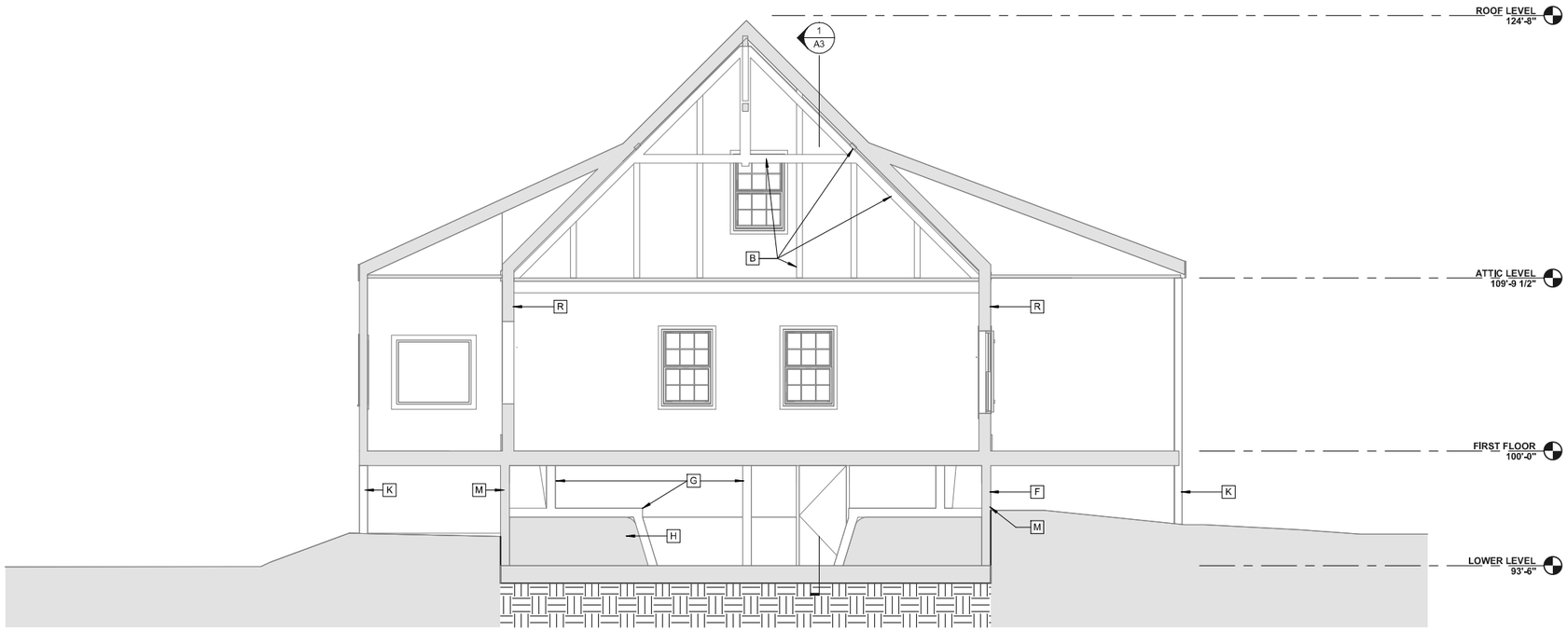
U. WOOD LAP SIDING
V. PLASTER WITH LIME WASH
W. WOOD SHAKE ROOFING
X. CLAY PARGING
Y. LIKELY ORIGINAL LOCATION OF NOW MISSING VERTICAL LOG WALL
Z. INTERIOR VERTICAL LOG WALL

**BVH NOTE:**

**THE DRAWINGS SHOWN WERE CREATED BASED ON LIMITED FIELD VERIFICATION. PRIOR DWGS CONSULTED WERE:**
- **THE 1956 HABS**
- **THE 1994 "STABILIZATION OF THE AMOUREAX HOUSE"**

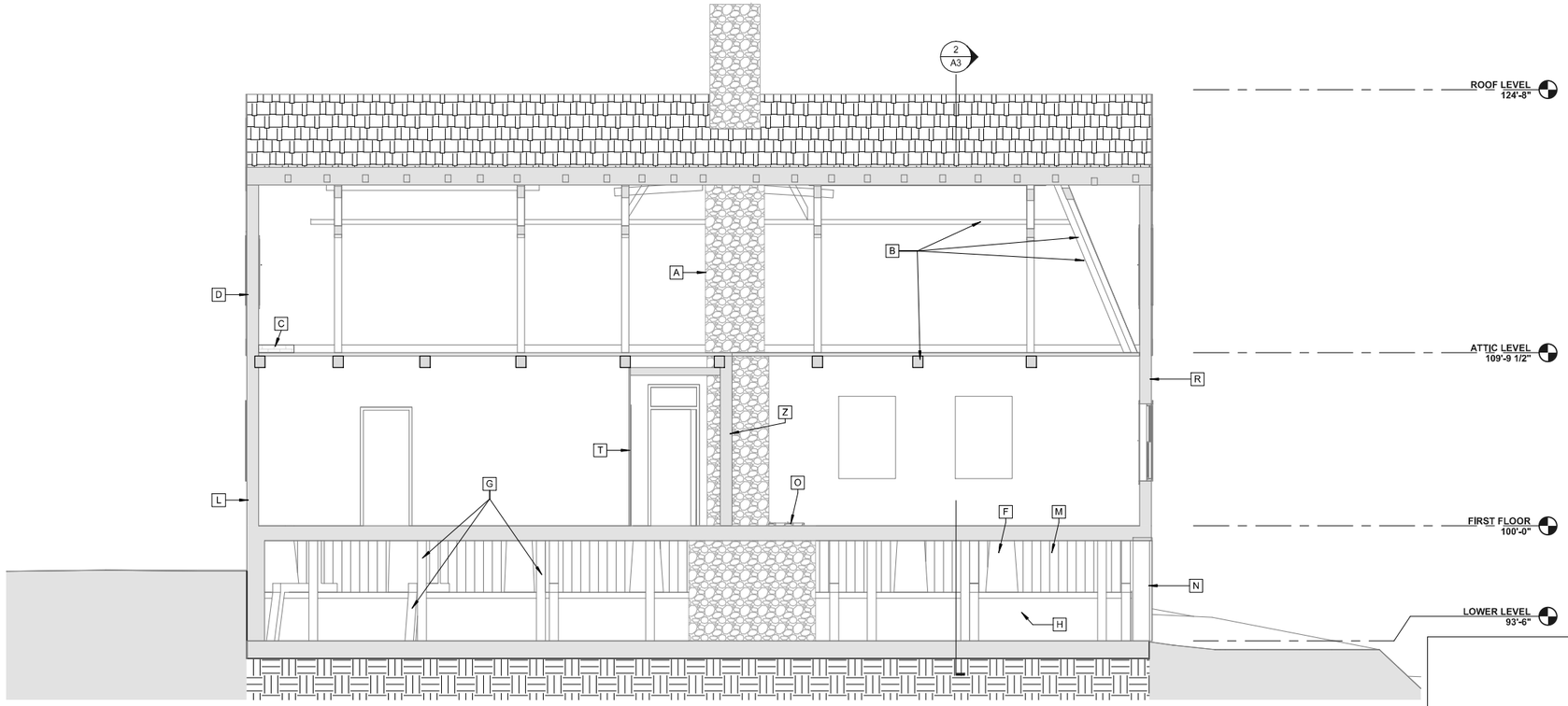
**DWGS ARE TO BE USED FOR GENERAL SCALE, MASSING AND CONFIGURATION PURPOSES ONLY.**

| | | | | |
|---|---|---|---|---|
| | DESIGNED: JCAWBY<br>CADD BHEIDE<br>TECH. REVIEW:<br>DATE: 09/24/2021 | SUB SHEET NO. A2 | TITLE OF SHEET<br>EXISTING BUILDING EXTERIOR ELEVATIONS<br>STE. GENEVIEVE NATIONAL HISTORICAL PARK | DRAWING NO.<br>PKG. NO.<br>SHEET 3 OF 6 |




2 TRANSVERSE BUILDING SECTION

1/4" = 1'-0"




1 LONGITUDINAL BUILDING SECTION

1/4" = 1'-0"

## NOTE LIST

A. STONE CHIMNEY
B. TIMBER FRAMING ELEMENTS
C. REMNANTS OF REMOVED BRICK CHIMNEY, CUT OFF AT ATTIC FLOOR LEVEL
D. 2X WOOD FRAMING

E. STONE CHIMNEY FOUNDATION
F. STONE PIER
G. 1994 WOOD SHORING SYSTEM THRU-OUT
H. 1994 BULKHEAD RETAINING WALL
I. DIRT FLOOR AND STONE STEPPING STONES
J. SUMP PUMP AND PIT
K. GALERIE FRAMING
L. WEST WALL STONE FOUNDATION
M. NORTH AND SOUTH VERTICAL LOG WALLS
N. EAST WALL VERTICAL LOGS RESTING ON STONE FOUNDATION

O. STONE HEARTH
P. 1792 DOOR FRAMING, INFILLED WITH VERTICAL LOGS.
Q. 1792 DOOR FRAMING NOTED BY OTHERS DURING PRIOR ASSESSMENT
R. PALISADED LOG WALL
S. WOOD AND PLASTER PARTITION
T. WOOD PARTITION

U. WOOD LAP SIDING
V. PLASTER WITH LIME WASH
W. WOOD SHAKE ROOFING
X. CLAY PARGING
Y. LIKELY ORIGINAL LOCATION OF NOW MISSING VERTICAL LOG WALL
Z. INTERIOR VERTICAL LOG WALL

**BVH NOTE:**

**THE DRAWINGS SHOWN WERE CREATED BASED ON LIMITED FIELD VERIFICATION. PRIOR DWGS CONSULTED WERE:**
- **THE 1956 HABS**
- **THE 1994 "STABILIZATION OF THE AMOUREAX HOUSE"**

**DWGS ARE TO BE USED FOR GENERAL SCALE, MASSING AND CONFIGURATION PURPOSES ONLY.**

DESIGNED: JCAWBY
CADD
BHEIDE
TECH. REVIEW:
DATE: 09/24/2021

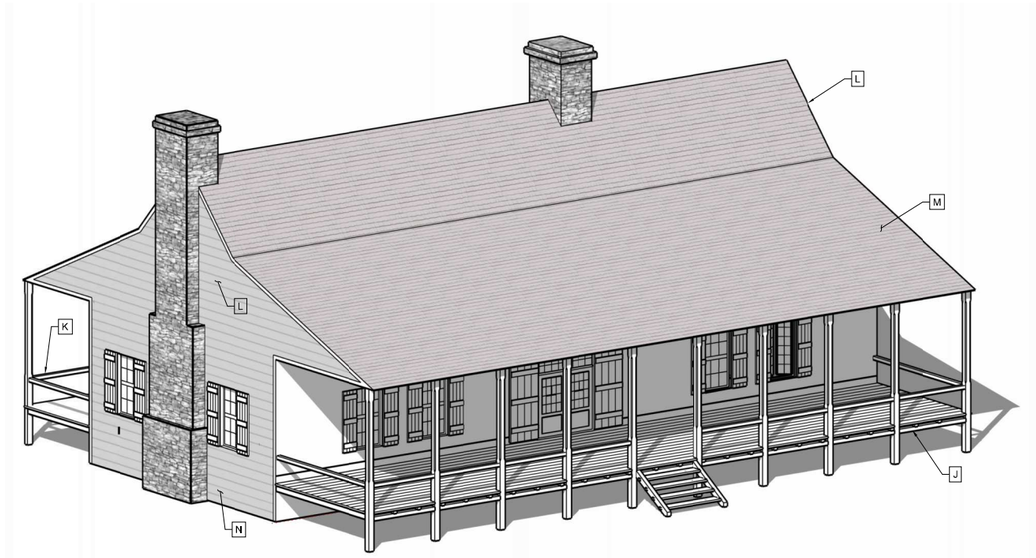
SUB SHEET NO. A3

TITLE OF SHEET
EXISTING BUILDING SECTIONS
STE. GENEVIEVE NATIONAL HISTORICAL PARK

DRAWING NO.

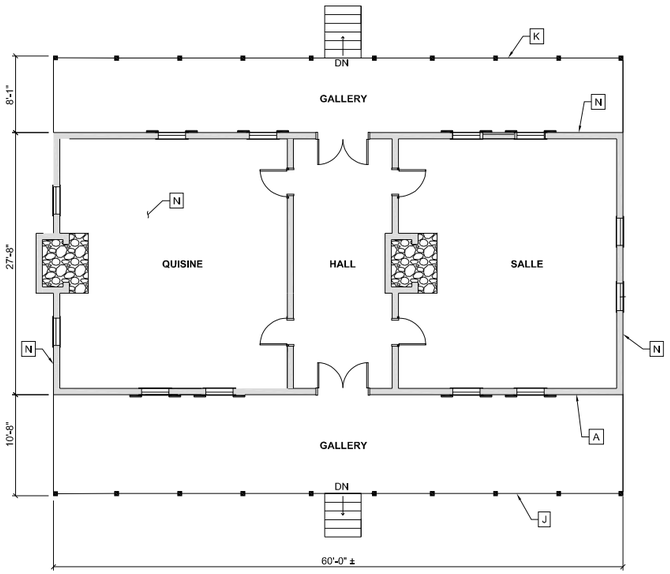
PKG. NO.

SHEET 4 OF 6



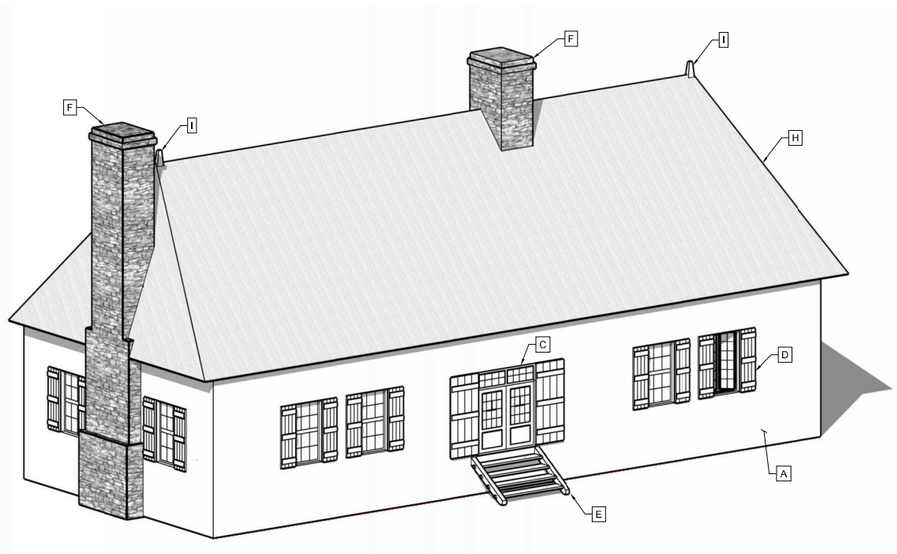

4 c. 1847 MODIFICATIONS, SOUTH AND WEST ELEVATIONS

NO SCALE



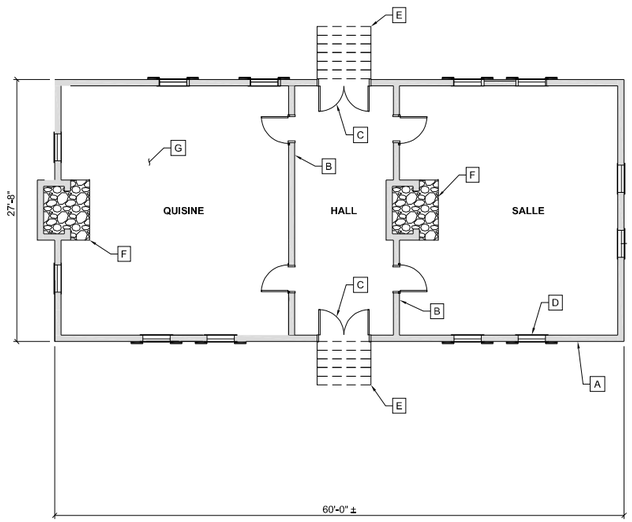

3 c. 1847 PLAN

1/8" = 1'-0"




2 c. 1792 ORIGINAL CONSTRUCTION, SOUTH AND WEST ELEVATIONS

NO SCALE




1 c. 1792 PLAN

1/8" = 1'-0"

## NOTE LIST

c. 1792 - ORIGINAL CONSTRUCTION

A. *POTEAUX-EN-TERRE* EXTERIOR LOG WALLS WITH LIME PLASTER ON SPLIT LATH
B. VERTICAL LOG INTERIOR WALLS (BEARS ON FLOOR JOISTS)
C. EXTERIOR DOORS ON NORTH AND SOUTH WALLS, POSSIBLY DOUBLE DOORS. DOORS MAY HAVE BEEN SOLID WOOD OR PARTIALLY GLAZED.
D. GLAZED CASEMENT WINDOWS WITH SHUTTERS
E. EXTERIOR STAIRS
F. STONE MASONRY CHIMNEYS
G. *EN FILADE* PLAN WITH THREE ROOMS
H. HIPPED ROOF WITH THATCH OVER *LITEAUX*
I. KING POST FINIALS

c. 1847 - FIRST MAJOR ALTERATION

J. SOUTH GALLERY, c. 1847
K. NORTH GALLERY, POSSIBLY SAME DATE OR SLIGHTLY LATER
L. GABLE END WALLS, c. 1847
M. DOUBLE-PITCHED ROOF WITH WOOD SHINGLES
N. WOOD LAP SIDING ON NORTH, EAST, AND WEST WALLS

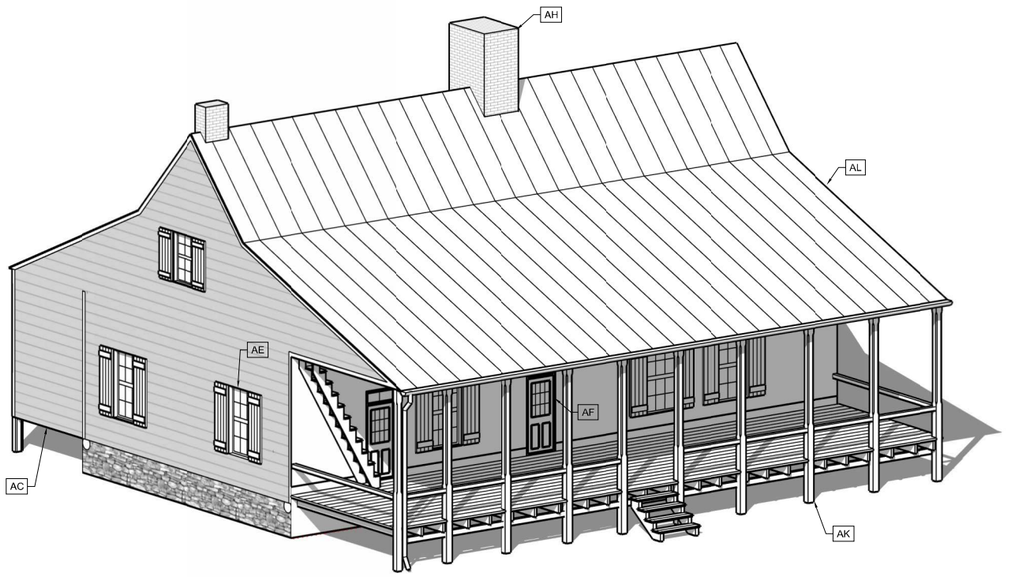
c. 1880 - SECOND MAJOR ALTERATION

O. WEST LOG WALL AND SOME ROOF FRAMING REMOVED, REPLACED WITH DIMENSION LUMBER FRAME WALL WITH BRICK NOGGING ON A LIMESTONE FOUNDATION WALL
P. BEARING ENDS OF VERTICAL LOGS REMOVED AND REPLACED WITH A LIMESTONE FOUNDATION WALL
Q. GALLERY POSTS AND JOISTS REPLACED OVER TIME
R. SOUTH GALLERY STAIRS RELOCATED
S. STAIRS TO GRENIER
T. NORTH AND SOUTH ENTRY DOORS MODIFIED
U. DOUBLE HUNG 6-OVER-6 WINDOWS WITH LOUVER SHUTTERS
V. BRICK MASONRY CHIMNEY, LIKELY FOR STOVE
W. WOOD PLANK PARTITION WALL, MAY PREDATE OTHER PARTITION WALLS
X. DIMENSION LUMBER PARTITION WALL WITH PLASTER ON LATH
Y. CENTRAL CHIMNEY LIKELY MODIFIED FOR STOVE
Z. DOOR ADDED AND WINDOWS ALTERED
AA. PLASTER ON LATH CEILINGS IN ALL ROOMS
AB. INTERIOR SUBDIVIDED AFTER APPROX. 8-FEET REMOVED FROM WEST END

c. 1965 - RESTORATION

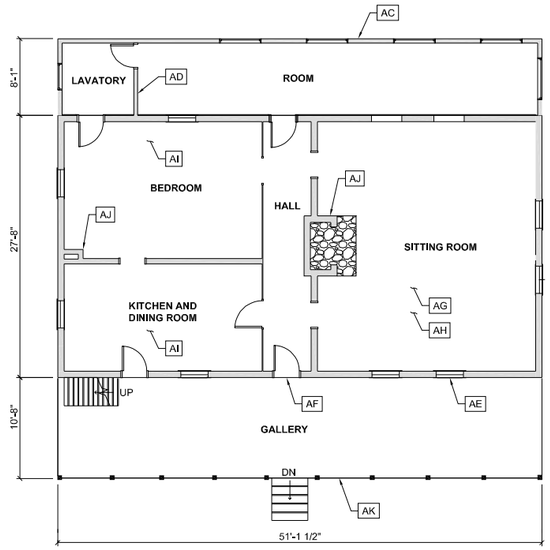
AC. NORTH GALLERY MOSTLY RECONSTRUCTED AN ENCLOSED WITH A DIMENSION FRAME WALL AND WINDOWS
AD. LAVATORY AND DOORS
AE. WINDOWS AND SHUTTERS REPLACED
AF. SOME HISTORIC DOORS ARE RETAINED
AG. WOOD FLOORING REPLACED IN ALL ROOMS
AH. PLASTER CEILINGS REMOVED EXCEPT IN HALL
AI. CEILING PLANKS REPLACED IN WESTERN ROOMS
AJ. BRICK MASONRY CHIMNEYS RECONSTRUCTED
AK. SOUTH GALLERY RECONSTRUCTED
AL. METAL PANEL ROOFING REPLACED

| | | | | |
|---|---|---|---|---|
| | DESIGNED: LB LANK<br>CADD LB LANK<br>TECH. REVIEW:<br>DATE: 11/14/2023 | SUB SHEET NO. A4 | TITLE OF SHEET: BUILDING CHRONOLOGY<br>STE. GENEVIEVE NATIONAL HISTORICAL PARK | DRAWING NO.<br>PKG. NO.<br>SHEET 5 OF 6 |



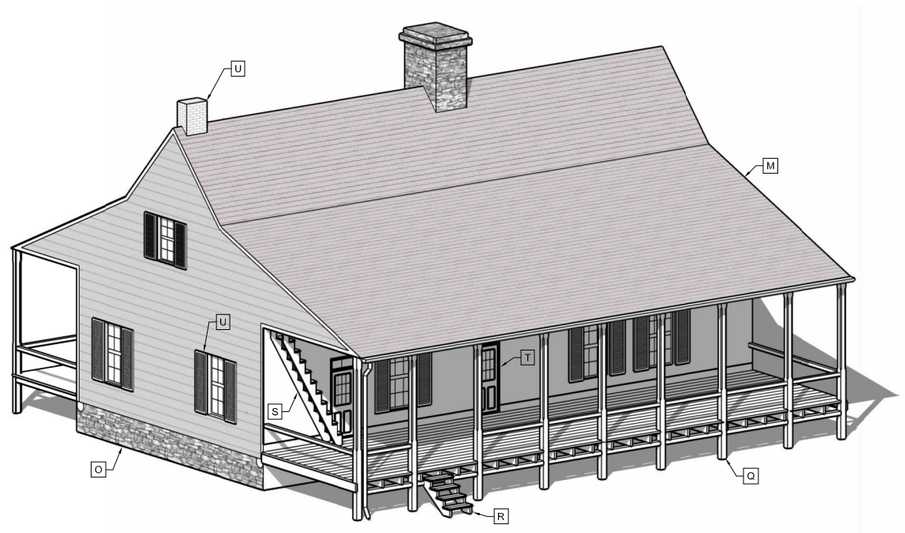

4 c. 1965 ALTERATIONS, SOUTH AND WEST ELEVATIONS

NO SCALE



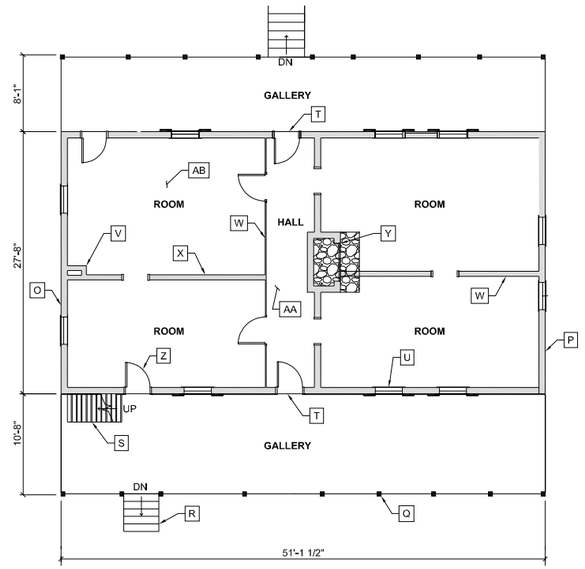

3 c. 1965 PLAN

1/8" = 1'-0"




2 c. 1880 ALTERATIONS, SOUTH AND WEST ELEVATIONS

NO SCALE




1 c. 1880 PLAN

1/8" = 1'-0"

## NOTE LIST

c. 1792 - ORIGINAL CONSTRUCTION

A. *POTEAUX-EN-TERRE* EXTERIOR LOG WALLS WITH LIME PLASTER ON SPLIT LATH
B. VERTICAL LOG INTERIOR WALLS (BEARS ON FLOOR JOISTS)
C. EXTERIOR DOORS ON NORTH AND SOUTH WALLS, POSSIBLY DOUBLE DOORS. DOORS MAY HAVE BEEN SOLID WOOD OR PARTIALLY GLAZED.
D. GLAZED CASEMENT WINDOWS WITH SHUTTERS
E. EXTERIOR STAIRS
F. STONE MASONRY CHIMNEYS
G. *EN FILADE* PLAN WITH THREE ROOMS
H. HIPPED ROOF WITH THATCH OVER *LITEAUX*
I. KING POST FINIALS

c. 1847 - FIRST MAJOR ALTERATION

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M. DOUBLE-PITCHED ROOF WITH WOOD SHINGLES
N. WOOD LAP SIDING ON NORTH, EAST, AND WEST WALLS

c. 1880 - SECOND MAJOR ALTERATION

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P. BEARING ENDS OF VERTICAL LOGS REMOVED AND REPLACED WITH A LIMESTONE FOUNDATION WALL
Q. GALLERY POSTS AND JOISTS REPLACED OVER TIME
R. SOUTH GALLERY STAIRS RELOCATED
S. STAIRS TO GRENIER
T. NORTH AND SOUTH ENTRY DOORS MODIFIED
U. DOUBLE HUNG 6-OVER-6 WINDOWS WITH LOUVER SHUTTERS
V. BRICK MASONRY CHIMNEY, LIKELY FOR STOVE
W. WOOD PLANK PARTITION WALL, MAY PREDATE OTHER PARTITION WALLS
X. DIMENSION LUMBER PARTITION WALL WITH PLASTER ON LATH
Y. CENTRAL CHIMNEY LIKELY MODIFIED FOR STOVE
Z. DOOR ADDED AND WINDOWS ALTERED
AA. PLASTER ON LATH CEILINGS IN ALL ROOMS
AB. INTERIOR SUBDIVIDED AFTER APPROX. 8-FEET REMOVED FROM WEST END

c. 1965 - RESTORATION

AC. NORTH GALLERY MOSTLY RECONSTRUCTED AN ENCLOSED WITH A DIMENSION FRAME WALL AND WINDOWS
AD. LAVATORY AND DOORS
AE. WINDOWS AND SHUTTERS REPLACED
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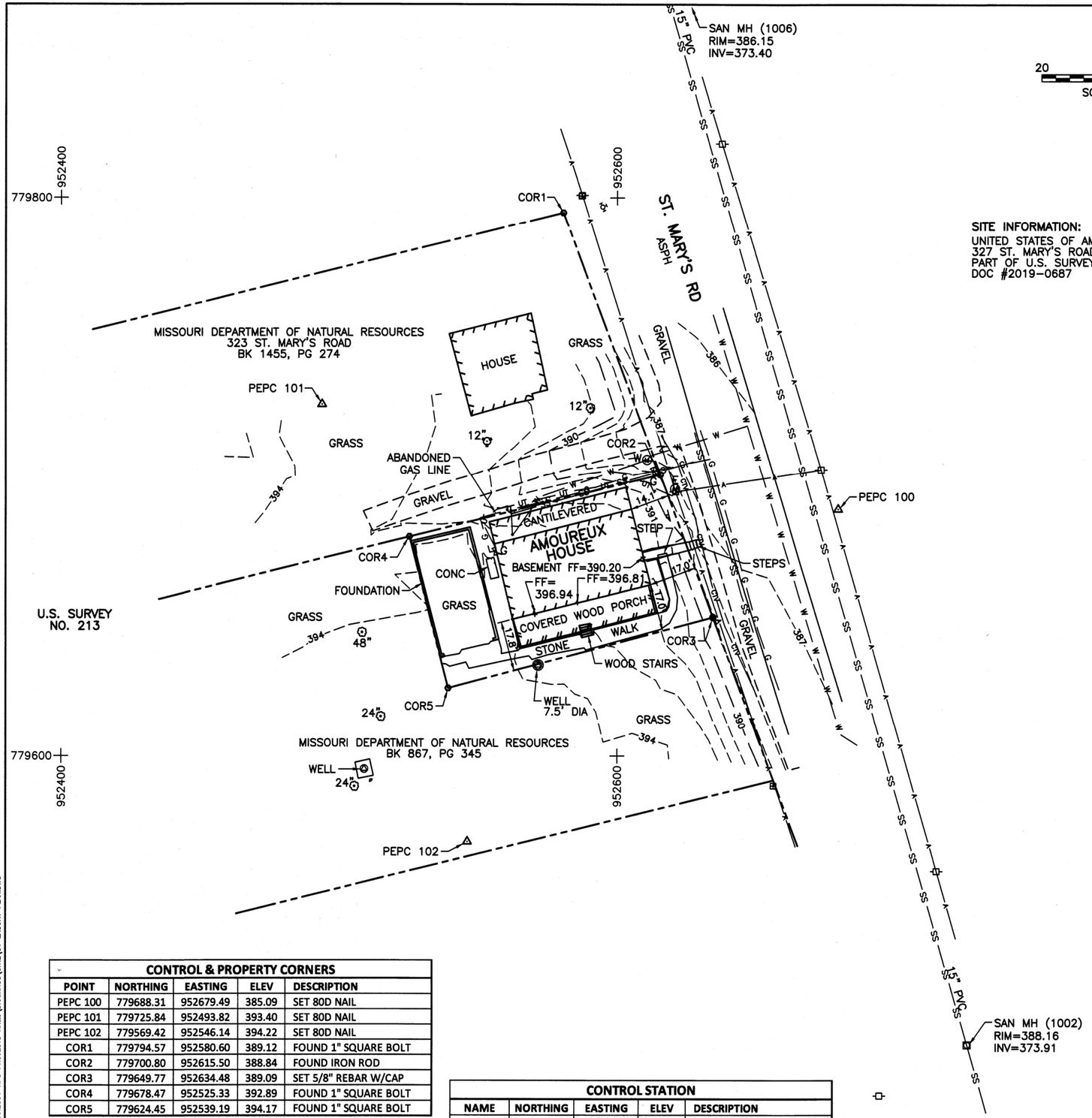
AJ. BRICK MASONRY CHIMNEYS RECONSTRUCTED
AK. SOUTH GALLERY RECONSTRUCTED
AL. METAL PANEL ROOFING REPLACED

| | | | | |
|---|---|---|---|---|
| | DESIGNED: LBLANK<br>CADD<br>LBLANK<br>TECH. REVIEW:<br>DATE: 11/14/2023 | SUB SHEET NO. A5 | TITLE OF SHEET<br>BUILDING CHRONOLOGY<br>STE. GENEVIEVE NATIONAL HISTORICAL PARK | DRAWING NO.<br>PKG. NO.<br>SHEET 6 OF 6 |

# Appendix B - Topographical Survey




**SITE INFORMATION:**
UNITED STATES OF AMERICA
327 ST. MARY'S ROAD
PART OF U.S. SURVEY 213, STE. GENEVIEVE, MO
DOC #2019-0687

## LEGEND

- CONTROL POINT
- DIA. DECIDUOUS TREE
- DIA. CONIFEROUS TREE
- FIRE HYDRANT
- WELL
- WM WATER METER
- W — W — WATER LINE
- CLEANOUT
- SANITARY SEWER
- POWER POLE
- EM ELECTRIC METER
- A — AERIAL ELECTRIC LINE
- TELEPHONE SPLICE BOX
- UT — UNDERGROUND TELE LINE
- GAS VALVE
- G — G — GAS LINE
- SIGN
- BUILDING LINE
- BUILDING OVERHANG
- FOUND 1" SQUARE BOLT
- SET 5/8" ROD W/CAP
- PROPERTY LINE
- CONTOUR LINE

CONTOUR INTERVAL = 1'

## UTILITY NOTE

THE LOCATIONS OF THOSE BURIED AND ABOVEGROUND UTILITIES SHOWN ARE APPROXIMATE, ARE SHOWN FOR CONTRACTOR INFORMATIONAL USE ONLY, AND ARE NOT TO BE REFERENCED FOR CONSTRUCTION PURPOSES. THE IMPLIED PRESENCE OR ABSENCE OF UTILITIES IS NOT TO BE CONSTRUED BY THE OWNER, ENGINEER, CONTRACTOR, OR SUBCONTRACTORS TO BE AN ACCURATE AND COMPLETE REPRESENTATION OF UTILITIES THAT MAY OR MAY NOT EXIST ON THE CONSTRUCTION SITE. BURIED AND ABOVEGROUND UTILITY LOCATION, IDENTIFICATION, AND MARKING ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. REROUTING, DISCONNECTION, PROTECTION, ETC. OF ANY UTILITIES MUST BE COORDINATED BETWEEN THE CONTRACTOR, UTILITY COMPANY, AND OWNER. SITE SAFETY, INCLUDING THE AVOIDANCE OF HAZARDS ASSOCIATED WITH BURIED AND ABOVEGROUND UTILITIES, REMAIN THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

**CONTROL & PROPERTY CORNERS**

| POINT | NORTHING | EASTING | ELEV | DESCRIPTION |
|---|---|---|---|---|
| PEPC 100 | 779688.31 | 952679.49 | 385.09 | SET 80D NAIL |
| PEPC 101 | 779725.84 | 952493.82 | 393.40 | SET 80D NAIL |
| PEPC 102 | 779569.42 | 952546.14 | 394.22 | SET 80D NAIL |
| COR1 | 779794.57 | 952580.60 | 389.12 | FOUND 1" SQUARE BOLT |
| COR2 | 779700.80 | 952615.50 | 388.84 | FOUND IRON ROD |
| COR3 | 779649.77 | 952634.48 | 389.09 | SET 5/8" REBAR W/CAP |
| COR4 | 779678.47 | 952525.33 | 392.89 | FOUND 1" SQUARE BOLT |
| COR5 | 779624.45 | 952539.19 | 394.17 | FOUND 1" SQUARE BOLT |

HORIZ: NAD 83, MISSOURI STATE PLANE EAST, GEOID 18, MODOT VRS
VERT: NAVD 88
METHOD: REDUNDANT GPS OBSERVATIONS UTILIZING MODOT VRS NETWORK

**CONTROL STATION**

| NAME | NORTHING | EASTING | ELEV | DESCRIPTION |
|---|---|---|---|---|
| SG-11 | 777002.72 | 953931.65 | 385.59 | NGS STATION PID 186011 |

GRID FACTOR = 0.9999400
ADJUSTED BY M.D.N.R. 2002

STATE OF MISSOURI
JASON B FLAMM
NUMBER LS-2006000177
PROFESSIONAL LAND SURVEYOR

I HEREBY CERTIFY THAT THE ABOVE PLAT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT THE SURVEY WAS EXECUTED IN ACCORDANCE WITH THE CURRENT MISSOURI MINIMUM STANDARDS FOR BOUNDARY AND TOPOGRAPHIC SURVEYS AS ESTABLISHED BY THE MISSOURI DEPARTMENT OF AGRICULTURE AND THE MISSOURI BOARD FOR ARCHITECTS, PROFESSIONAL ENGINEERS AND PROFESSIONAL LAND SURVEYORS, AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MISSOURI.

JASON B. FLAMM LICENSE NO. LS-2006000177
EXPIRES: 12-31-2022

12-11-2020
DATE

PREPARED FOR: NATIONAL PARK SERVICE
FIELD SURVEY COMPLETED 11/23/2020

Prairie Engineers
ENGINEERING SURVEYING SCIENTISTS
Prairie Engineers, P.C.
404 N. Main St.
Columbia, IL 62236
(217) 605-0403

DESIGNED: BB
CADD: BB
TECH. REVIEW: JF
DATE: 12/9/20

SUB SHEET NO.

TITLE OF SHEET
EXISTING BOUNDARY & SITE SURVEY
STRUCTURE REPORT & ABBREVIATED STRUCTURAL & BUILDING ENVELOPE ASSESSMENT
SAINT GENEVIEVE NATIONAL HISTORICAL PARK
SAINT GENEVIEVE, MISSOURI

DRAWING NO. ____
PMIS/PKG NO. 311235
SHEET 1 OF 1

DEC 10, 2020 11:39 AM BBRENNAN
L:\JOBS\2020\306.2001 NPS PROJECTS RR&A\DRAWINGS\CIVIL\C1 EXSURV PLAN.DWG

# Appendix C - Abbreviated Structural and Envelope Report

# Beauvais-Amoureux House

Ste. Geneviève National Historical Park
Ste. Geneviève, Missouri
PMIS 311235

# Abbreviated Structural and Building Envelope Assessment Report

**2021**

Beauvais-Amoureux House, south elevation.


**Prepared for:**
National Park Service, Midwest Regional Office
601 Riverfront Drive, Omaha, Nebraska 68102
402.661.1601 | Information Desk

**Prepared by**
Raths, Raths & Johnson, Inc.
500 Joliet Road, Suite 200, Willowbrook, Illinois 60527
630.325.6160 | Main Number

# BEAUVAIS-AMOUREUX HOUSE
## ABBREVIATED STRUCTURAL and BUILDING EVELOPE ASSESSMENT REPORT
Ste. Geneviève National Historical Park

Ste Geneviève, Missouri

Recommended: _____ Date: _____
Superintendent,
Ste. Geneviève National Historical Park

Concurred: _____ Date: _____
Associate Regional Director,
Cultural Resources, Interior Regions 3,4, and 5

Approved: _____ Date: _____
Regional Director,
Interior Regions 3,4, and 5

NPS PMIS # 311235

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APPENDED

Appendix A – Cost Estimate for Treatment Recommendations

## PROJECT TEAM

**Raths, Raths and Johnson, Inc.**

Lurita McIntosh Blank, NCARB, RBEC | Historical Architect
George R. Mulholland, P.E., S.E. | Structural Engineer
Demetria Boatwright | Structural Engineering Staff

**BVH Architecture**

Stephen J. Kelley, FAIA, S.E., FAPT | Historic Preservation Specialist

**Anthony and Associates, Inc.**

Ron Anthony | Wood Scientist

**National Park Service – Midwest Regional Office**

Tonya Bradley | Contracting Officer
Nicholas Murray | Contracting Specialist
John Rosemurgy | Historical Architect and Contracting Officer's Representative

**National Park Service – Ste. Geneviève National Historical Park**

Christopher M. Collins | Park Superintendent

**National Park Service – Gateway Arch National Park**

Laura M. Johnson | Historical Architect

## GLOSSARY[1]

**Bousillage**. (French) A mixture composed of mud or clay with straw, hair, or Spanish moss, for infill between the posts in the construction of vertical log buildings.

**Caveau**. (French) A crawl space or cellar.

**Collar Tie**. The horizontal member of a Norman truss located at the approximate midpoint of the diagonal top chord members.

**Galerie**. (French) Gallery or veranda; a porch extending the full length of either one, two, or four sides of a building.

**Grenier**. (French) Attic; the loft of a house.

**King Post**. The central vertical member of the Norman truss that connects the diagonal top chord members to the collar tie.

**Liteaux**. (French) Small battens or straps onto which roofing thatch was attached.

**Nogging**. Brick masonry infill between wood framing members.

**Norman Truss**. A French vernacular variation on the "king post truss," characterized by a steep pitch, through purlins, and the elevated position of the collar beam.

**Rafter**. A diagonal roof framing member: "primary rafters" are those of the main roof structure, and "secondary rafters" are those of the galerie roof structures.

**Pierrotage**. (French) Infill of stone and clay daub or lime mortar; packed between the posts of a heavy timber frame.

**Poteau(x)**. (French) Timber post or vertical log member.

**Poteaux-en-terre**. (French) "Posts in the ground"; a construction type where the vertical logs are set into the ground.

**Poteaux-sur-sole**. (French) "Posts on a sill"; a construction type where the vertical logs sit on a horizontal sill plate, and the foundation is typically constructed of stone masonry.

**Purlin**. A longitudinal, horizontal member of the roof framing that provides midspan support for the rafters; "through-purlins" pass over the top of of the truss diagonal top chords.

**Ridge Beam**. A longitudinal, horizontal member at the apex of the roof framing which supports the top ends of the rafters.

**Ridge Brace Truss**. A longitudinal flat truss at the apex of the roof that provides support between the Norman trusses; the ridge beam forms the top chord of this truss.

**Top Chord**. The diagonal members of the Norman truss that form the distinctive "A-frame" shape, with the crossbar formed by the collar tie.

**Top Plate**. A horizontal wood member that bears on the tops of the vertical log walls.

**Trenail**. A tapered wood pin used in traditional heavy timber construction.

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[1] Terms referencing French vernacular construction are adapted in part from the glossary provided by Jack Richard Luer and Jesse W. Frances in *Vanishing French Heritage: A Complete Study of the Vertical Log Homes of the Illinois Country*, (Chesterfield, MO: Independent Publishing Corporation), 202-209.

## A NOTE ON DATES

**No notation**. Direct attribution of the date or date range given is supported by historical documentation or physical evidence; ex: 1937 or 1852–1923.

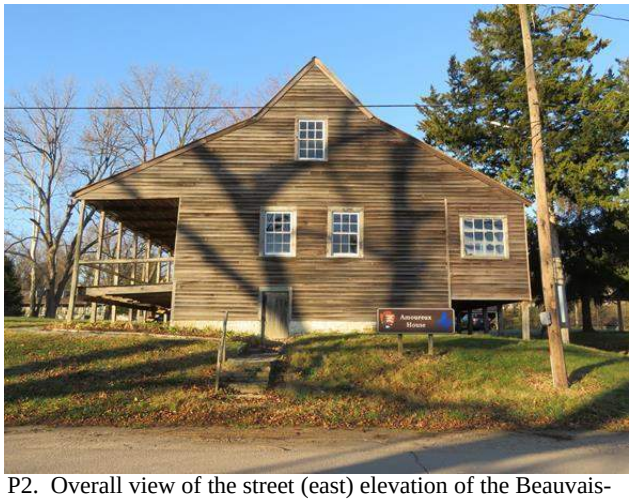
**Circa (c.)**. **A**ttribution to within one or two years of the date or date range given is supported by historical documentation or physical evidence, but the precise dates are not known; ex. c. 1792 or c. 1852 – c. 1856.

**Dash (**–). Indicates that the range given is inclusive of the years between the start and end dates, such as an ongoing event or period of ownership, ex: 1923 – 1963.

**Slash (/)**. Indicates that two or more specific dates are referenced without being inclusive of the years between; ex: c.1792/c.1852 or 1940/1986.

**Decade Span**. Indicates a ten-year span, but the date or date range given are approximate and may be refuted by further study; ex: 1920s or 1880s – 1900s.

P1. Overall view of the Beauvais-Amoureux House, front (south) elevation.



P2. Overall view of the street (east) elevation of the Beauvais-Amoureux House, note the masonry foundation extending to the first-floor level.

## INTRODUCTION

Raths, Raths & Johnson, Inc. (RRJ) was contracted by the National Park Service (NPS) to perform an abbreviated structural and envelope assessment of the Beauvais-Amoureux House (the House) and prepare a report of findings, to include observed conditions, limited structural analysis, and preliminary treatment recommendations with probable construction costs. This assessment was prompted by park staff concerns related to ongoing water intrusion at the roof, as well as deterioration and distress at the roof trusses, floor framing, and exterior vertical log walls. This report was prepared in advance of a Historic Structures Report (HSR) for the House, which will address a detailed historical overview, timeline of the site's physical development and use, and broader recommendations for the treatment and interpretation of the site. Additional research and analysis performed within the scope of the HSR may expand upon or update information provided in this report.

From November 16 to 18, 2020, representatives from RRJ and BVH Architecture were on-site to perform a physical investigation into the structural systems, the condition of the existing structural and architectural members, and the condition of the exterior cladding and roofing. The physical investigation was limited to areas readily visible; no overly intrusive investigation was performed, and no finishes were removed to expose concealed conditions.

### *General Description*

The Beauvais-Amoureux House is located at 327 St. Mary's Road in Ste. Geneviève, Missouri (Photographs P1 and P2). The House is recognized as one of only five extant *poteaux-en-terre* (meaning "post in the earth") vertical log structures in North America; of which three are located in Ste. Geneviève. In its current form, the House is of the "Mississippi Valley French Colonial" style[2] with modern alterations, having a broken-pitch gable roof, an open *galerie* (porch) on the south, an enclosed galerie on the north, a walk-out *caveau* (cellar), and an unfinished *grenier* (garret or attic) accessible from an exterior stair. The main entrance is centered on the south wall, and the east elevation faces St. Mary's Road (historically called New Bourbon Street). The House is currently partitioned in a center-hall plan, with a narrow central passageway flanked by rooms on the east and west. A c. 1792 stone masonry chimney is located in the wall between the central hall and the great room to the east, and a partially deconstructed 1880s – c. 1900 brick masonry chimney is located on the inside of the west wall.

[2] Jay Edwards, "Louisiana's French Creole Architecture." National Register of Historic Places Nomination Form (Washington, DC: U.S. Department of the Interior, National Park Service, 1991), https://catalog.archives.gov/id/73972785.

***Methodology***

In the execution of this scope, the project team performed the following:

- Reviewed documentation on the Beauvais-Amoureux House provided by NPS and from other sources, as well as available documentation on similar structures in Ste. Geneviève, Missouri; Natchitoches, Louisiana; and Pascagoula, Mississippi.
- Performed a physical investigation of the House from the interior and exterior.
- Field verified select dimensions and measurements to confirm conditions as documented by others.
- Measured knot sizes, depth of checks, and slope of grain to assess and the condition of and assist in grading the individual wood members at trusses and beams.
- Probed the soil adjacent to vertical logs in an effort to identify below-grade deterioration, supported by visual confirmation of vertical log decay conditions with shallow test pits at select locations.
- Performed moisture content readings at foundation logs to develop a qualitative moisture content profile.
- Performed qualitative resistance drilling at select vertical logs, structural joists, trusses, *rafters*, and *purlins* in an effort to identify areas of concealed decay.
- Collected samples of wood from select structural members for species identification.
- Collected discrete samples of the original *pierrotage*, replacement cementitious pierrotage and *bousillage*, parging, lime wash or paint, and soil for laboratory studies.
- Performed a level survey using a laser level on the main floor and attic floor to aid in future study of the building physiology and to serve as a benchmark for long-term monitoring for future differential settlement.
- Placed level marks using a laser level on foundation logs, piers, chimney, and shoring members in the caveau to aid in future study of the building physiology and to serve as a benchmark for long-term monitoring for future differential settlement.

## ABBREVIATED HISTORY OF DEVELOPMENT

The House has undergone several eras of significant alteration. The construction dates given below are supported through historical documentation in the form of deeds, tax rolls, and liens; by dendrochronological dating of select framing members performed by Dr. Richard Guyette of the University of Missouri – Columbia;[3] or by physical evidence, such as lumber type, nails, and other construction practices that can be generally associated with a specific period of time.

- c. 1792 – c. 1852: As originally constructed by the Beauvais family, the House had a hipped roof covered in thatch. The exterior vertical log walls may have been whitewashed or plastered.
- c. 1852: Under ownership by the Amoureux family, the end gable walls, galeries, and broken pitch roof were constructed. The roofing was likely replaced with wood shake.
- Likely c. 1852: The east, west, and north walls were covered with wood weatherboard siding, the south wall was plastered.
- 1880s – c. 1900: At a yet unconfirmed date, the west end of the structure was demolished and reconstructed. The vertical logs of the exterior wall, the west hipped roof framing, and the westernmost Norman truss were removed, permanently shortening the structure by approximately 8 to 12 feet. The interior layout was likely heavily modified during this time.
- 1880s – c. 1900: At the east end wall, the poteaux-en-terre construction was also modified to sit on wood sill bearing on a new limestone foundation.
- Before 1936: The roofing was replaced or covered with corrugated metal panels, which was common practice in Ste. Geneviève at that time.

[3] Richard Guyette. "Tree Ring Dating of French Colonial Vertical Log Houses in St. Geneviève, Missouri," unpublished report. (University of Missouri – Columbia, n.d. [1986]).

- 1936 – 1940: Photographs were taken by the Historic American Buildings Survey (HABS).[4] Photographs were again taken for the HABS collection in 1986.
- 1956: Measured drawings of the House were prepared for the HABS collection.
- 1963: The Donze family acquired the House and renovated it for use as a historic house museum. The interiors were modified, both galeries reconstructed, and the north galerie enclosed. A standalone structure was also constructed immediately to the west of the House.
- 1993: The Great Flood of 1993 flooded the caveau of the Beauvais-Amoureux House, exacerbating differential settlement issues at the first floor and attic floor. Shoring, which is still in place, was installed to support the first-floor structure.
- 1994-2017: Under the stewardship of the Missouri Department of Natural Resources (DNR), numerous repairs were performed, including replacing the exterior siding and roofing with new cedar products in 2004.
- 2018 – 2020: NPS acquired the House in 2018 along with other historic properties to form the Ste. Geneviève National Historical Park, established in 2020.

## STRUCTURAL SYSTEMS

### *Physical Description – Original Construction*

The House was originally constructed with vertical logs embedded in the soil (poteaux-en-terre construction), which extend to the top of the first floor on all four sides (Photograph P3). The voids between the vertical logs were infilled with stone and clay *nogging*, called pierrotage. The lateral bracing within the vertical log walls is horizontal rather than diagonal; this is a somewhat unusual bracing system, seen only at the Beauvais-Amoureux House and the Vital St. Gemme Beauvais House,[5] which was constructed at approximately the same time with similar wall and floor structural systems.

The c. 1792 hipped roof framing is a truss system (Photograph P4 and Figure 1), consisting of (A) six "Norman" trusses, of which five are extant, (B) nine ceiling beams spanning between the south and north walls, a (C) roof *ridge beam* (D) and *ridge brace trusses* spanning east to west between the Norman trusses, (E) horizontal purlins at approximately mid-height of the truss *top chords*, (F) primary rafters spanning from the ridge beam to the (G) wall *top plate*, (H) a stone masonry chimney that also assists with bracing the Norman trusses, and

P3. Exposed vertical logs, with pierrotage and horizontal bracing at north wall.

P4. Norman roof trusses, looking east.

[4] "The Amoureaux House, Ste. Geneviève, Ste. Geneviève County, Missouri" (photographs, measured drawings, written historical and descriptive data), Historic American Building Survey (National Park Service, U.S. Department of the Interior, 1956), https://www.loc.gov/item/mo0247/.

[5] "Vital St. Gemme Beauvais House I, 20 South Main Street, Sainte Geneviève, Ste. Geneviève County, MO" (photographs, measured drawings, written historical and descriptive data). Historic American Building Survey (National Park Service, U.S. Department of the Interior, 1985), https://www.loc.gov/item/mo0249/.

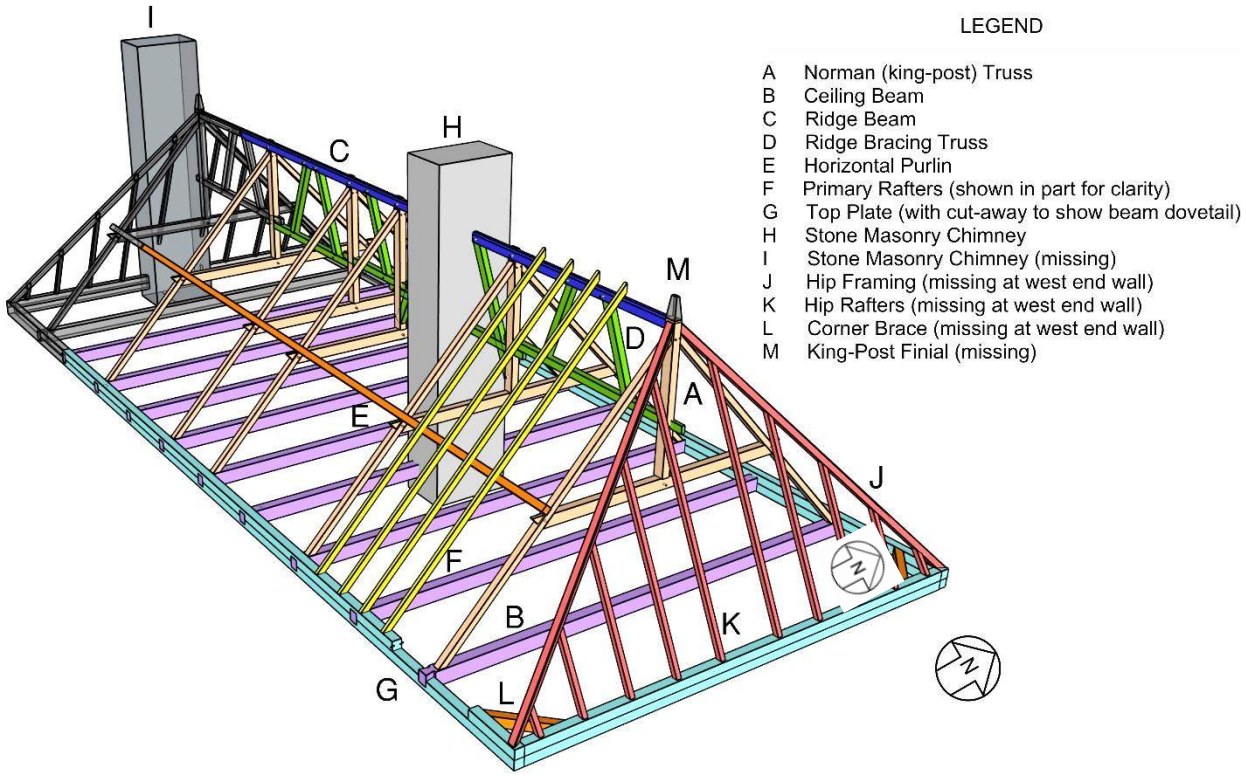



Figure 1. Schematic diagram of roof framing, c. 1792, with conceptual west hip framing.

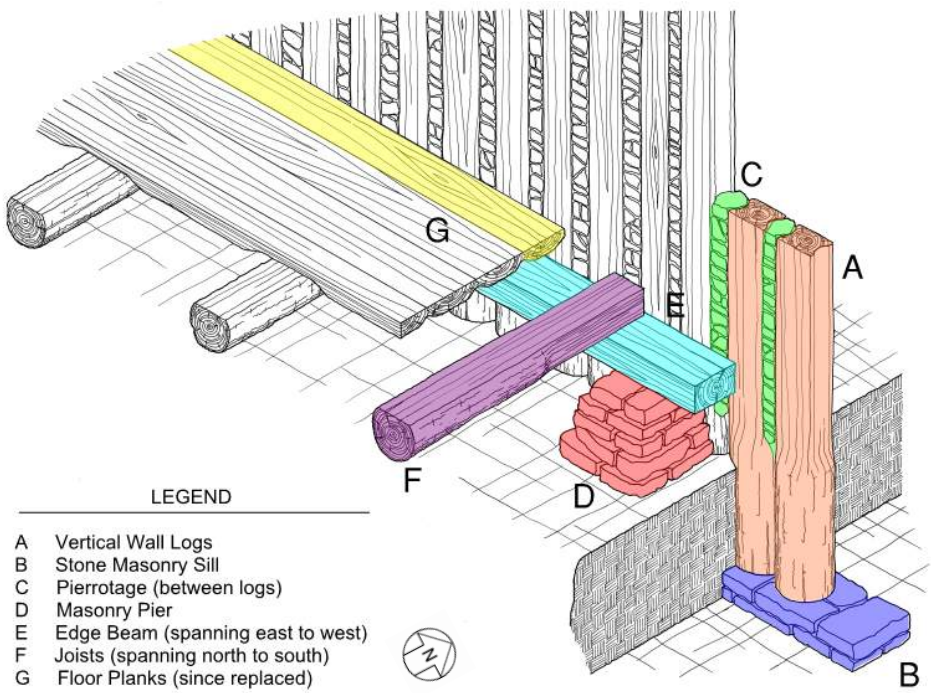



Figure 2. Schematic diagram of first floor construction, c. 1792 (based on HABS drawings from the Vital St. Gemme Beauvais House).

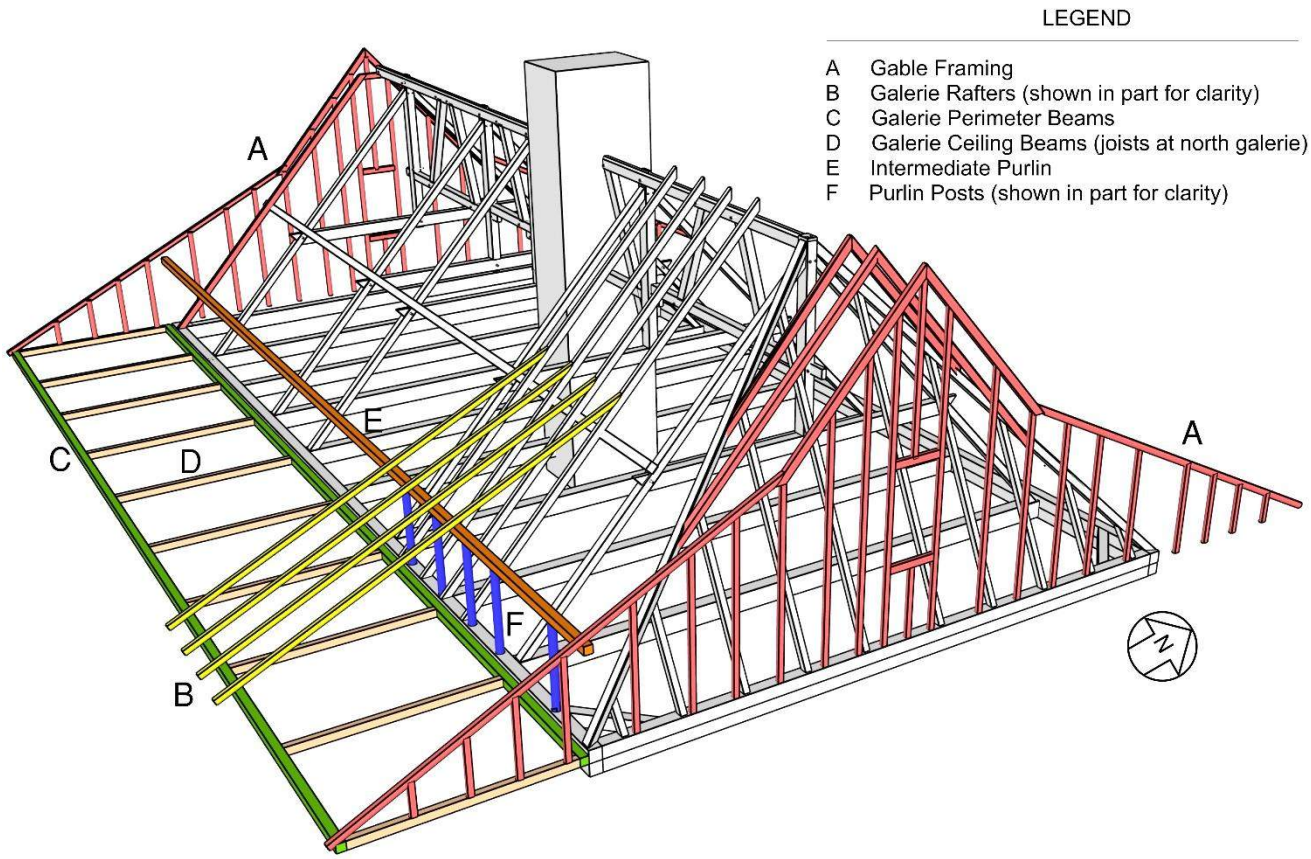



Figure 3. Schematic diagram of roof framing, c. 1852.

(J) diagonal hip framing, and (K) hip rafters that were located at the east and west ends.

The first floor is structurally separate from the vertical log walls (Figure 2). The first floor is supported by (D) masonry piers. Full-length timber (E) edge beams span east to west, bearing on the masonry piers, and (F) timber joists span north to south, bearing on the edge beams. The joists were hewed in place to create a level surface for the (G) first-floor wood planks. Analysis of the relationship between the wall and floor framing for poteaux-en-terre structures suggests that the floor framing was likely constructed prior to the vertical logs.[6]

***Physical Description – Later Alterations***

The existing roof is a broken-pitch gable that spans the full length of the structure (Figure 3). Based on historical documentation, the (A) gable end walls and full-length galeries were installed c. 1852. As originally constructed, both galeries were open. New (B) rafter members were installed to form the galerie roofs; each galerie rafter member attaches to one of the original roof rafters at approximately the primary roof horizontal purlin and spans out to the galerie (C) perimeter beam with an (E) intermediate horizontal purlin on (F) posts that bear on the wall top plate. At the south galerie ceiling, (D) timber joists span from the perimeter beam to the top plate; at the north, these beams have been replaced with modern dimension lumber joists.

At a later point in time, a portion of the west end of the House was removed, and the west wall was reconstructed. The framing at the east and west gable walls differs, suggesting that the existing west wall was constructed sometime after the east. The existing west end wall was constructed with a stone masonry foundation, a brick masonry chimney, and wood studs

[6] Luer and Frances, *Vanishing French Heritage*, 78-79.

with brick nogging. Based on existing truss spacing, historical documentation, and previous studies of the House by the Missouri DNR and others, likely between 8 to 12 feet were permanently removed from the west end. The archeological excavations performed in 1996 located a chimney foundation, remnants of foundation logs, and the possible footprint of the caveau excavation at the west, narrowing this dimension to closer to 8 feet.[7] The reasoning for the alteration is unknown, but one of the original six roof trusses was lost. Only five roof trusses remain within the present attic space. It is believed that there were six original roof trusses, based on carpentry marks in Roman numerals found on each truss member, starting with Roman numeral "II" at the existing westernmost truss to Roman numeral "VI" for easternmost truss. Truss "I" is no longer extant.

***Vertical Log Walls***

Description of Existing Construction

The vertical log walls, according to the dendrochronology report, are composed of *Juniperus virginiana* (eastern red cedar). Below grade, the logs

P5. Southeast corner from inside the caveau, showing the vertical logs, clay parge, and stone foundation at the east.

P6. Close-up view of north end of west elevation masonry foundation wall. Note the end of first-floor beam is exposed.

P7. Exterior north and south elevation logs are covered with parging, which appears to be clay and straw.

P8. Close-up of clay parging with straw.

[7] No Author Rep., "*Preliminary Report on Excavations at the St. Gemme Beauvais/Amoureux House, Ste. Genevieve, Missouri*," (No date [1996]), 5.

are unhewn; above grade, the log-to-log faces were hewn slightly concave to key in the pierrotage, and the outward faces were hewn flat to allow application of wall treatments. It has not been confirmed how deep the logs were originally set in the ground. During the restoration of the c. 1807 Bequette-Ribault House, the third extant poteaux-en-terre structure in Ste. Geneviève, the vertical logs were found to be approximately 24 inches below grade on average.[8]

The poteaux-en-terre construction is wholly intact in its original form on the north and south elevations. The Missouri DNR may have added one additional log at the southwest corner as part of the 2007 restoration work. On the east elevation, the logs are intact but have been modified to bear upon a wood sill and stone masonry foundation wall. The reconstructed west wall also has a stone masonry foundation (Photographs P5 and P6).

The voids between logs are filled with a mixture of clay and stone known as pierrotage. It was noted that some of the clay fill between logs on the south elevation below the galerie had been replaced with a cementitious material. On the exterior side of the vertical log walls below the north and south galeries, the logs are coated with a clay parging reinforced with vegetative material mixed with the clay (Photographs P7 and P8). The parge was limewashed or painted. At the caveau interior, a thin clay parge coat has been applied over the pierrotage and logs; based on HABS photography, the interior parge coat postdates 1986.

The logs terminate at the attic level, where they are notched to receive a horizontal top plate made of two members that total 12.5 inches deep by 5 inches wide. The bottom of the two top plate members is fastened to the vertical logs with two forged nails installed through the exterior face of the vertical log (Photograph P9). The king post or "Norman" trusses bear directly upon the first-floor ceiling beams, which are dovetailed into the double top plate.

Photograph P9. Vertical logs notched to receive top plate, with two forged nails per log, as exposed at the north wall.

Condition Assessment

Where exposed, the vertical logs showed no signs of present or past insect infestations, though it was observed that every log had several chemical treatment rods, possible boron, installed on the interior and exterior in the caveau. Cedar is not as attractive to termites as other types of wood because cedar contains allelochemicals which make it naturally insect resistant. The allelochemicals also make the wood denser and darker, hence the red color of the cedar.

There are previous reports of building settlement and floor deflection issues after the Great Flood of 1993 and by the Missouri DNR in 1998. Pronounced differential settlements can be easily observed by the naked eye on the first and attic levels, but little evidence of active differential movement of the vertical logs was observed during the physical investigation. This is based upon the intact condition of the pierrotage, clay-parge coating, contemporary interior plaster, and exterior plaster on the south elevation, all of which exhibited little to no evidence of distress that is traditionally associated with differential movement. Small cracks in the interior and exterior plaster were present at window openings, but these are common and not necessarily indicative of deleterious building movement.

Probing

The soil adjacent to the vertical logs was probed to determine the condition of the logs below grade at the north and south walls. A 30-inch-long hex-head screwdriver was inserted at an approximate 45-degree

[8] Melburn D. Thurman, *Building a House in 18th Century Ste. Genevieve.* Ste. Genevieve, MO: Pendragon Press, 1984, 5.

P10. Probe extended into soil at 45 degrees approximately 6 inches from vertical log.

P11. Test pit exposed deteriorated wood below grade and the log appeared hollow.

angle at various distances from the logs. The probing began at about 6 inches away from the face of the log, which would contact the log at about 6 inches below grade (Photograph P10). The probing was performed on each log at multiple depths until no resistance was felt at the log face. The probing encompassed about 85% of the logs at the north and south walls, both on the interior and exterior faces. It was determined that the logs typically have integrity to a depth of 10 to 12 inches below the caveau interior grade, and only 15% of the logs have integrity deeper than could be determined by the probe.

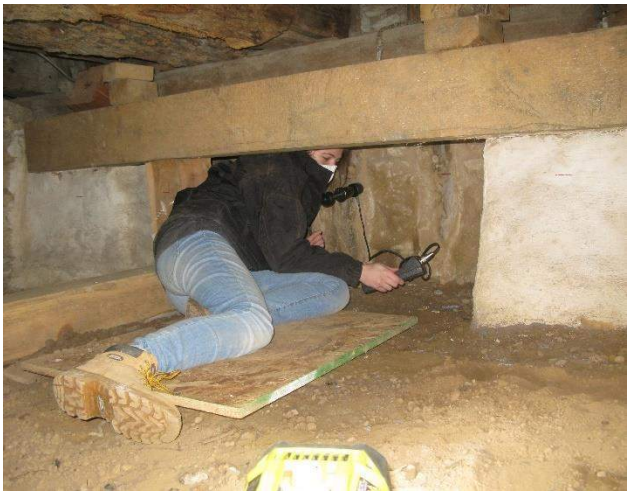
Test Pits

Small test pits were created in the soil adjacent to the vertical log wall with a small hand shovel on both the interior and the exterior faces one location where the log did not appear to have below-grade integrity based on the probing (Figure 4). Approximately 12 inches below the interior grade of the caveau, the log material was still intact, but the wood was fibrous and easily broken across the grain (Photograph P11). A sample of this deteriorated wood was removed from an existing hole at the northeast corner of the building for further analysis. It was noted that the soil adjacent to the south wall was wet, while that adjacent to the north wall was comparatively dry.

Moisture Content Readings

The moisture content of the wood was measured using electric resistance meters on the interior face of about 90% of the logs on the north and south elevations. Readings were taken slightly above the interior caveau grade and at approximately exterior grade, which is 12 to 18 inches higher than the grade inside the caveau.

Electric resistance meters indicate moisture content (MC) as a percentage of the oven-dry weight of the wood by measuring electrical conductivity between two probes inserted into the wood. This method works well because moisture is an excellent conductor of electricity and dry wood is an effective insulator. High conductivity generally indicates high moisture levels in the wood. Measurements above 20% MC are widely accepted to indicate a level of moisture that support fungal decay.



P12. View of personnel using Delmhorst RDM-2 meter in vertical logs within caveau.

Moisture content was measured using two devices: a Delmhorst BD–2100 with a 6 to 40% MC range on wood and contact pins with $^{5}/_{16}$-inch penetration and a Delmhorst RDM-2 with a 4.5 to 60% MC range and contact pins with 1-inch penetration.

- The Delmhorst BD-2100 resistance meter provides for rapid measurement in numerous locations but provides more qualitative and comparative MC measurements. See Table 1.

**Table 1. Delmhorst BD-2100 MC Readings**

| Elevation | Member | Reading Location | MC (%) |
|---|---|---|---|
| South | Vertical Log | Caveau Grade | 24-28% |
| South | Vertical Log | Exterior Grade | 12-15% |
| North | Vertical Log | Caveau Grade | 24-28% |
| North | Vertical Log | Exterior Grade | 8-10% |

- The Delmhorst RDM-2 resistance meter provides a more accurate MC measurement than the BD-2100 since the meter was designed to read moisture within wood only. The meter also allows the operator to input the temperature of the wood and wood species. The meter also provides a hammer-like probe handle to insert the probes to a depth of 1 inch (Photograph P12). The MC reading at a 1-inch depth is considered to be representative of the MC through the full depth of the member. The Delmhorst RDM-2 was used to take readings at select locations. See Table 2.

**Table 2. Delmhorst RDM-2 MC Readings**

| Elevation | Member | Reading Location | MC (%) |
|---|---|---|---|
| North/South | Vertical Log | Caveau Grade | 18-48% |
| North/South | Vertical Log | Exterior Grade | 17- 29% |
| East | Vertical Log | At Sill | 19% |
| East | Vertical Log | 1 foot Above Sill | 18% |
| N/A | Floor Joist | First Floor Framing | 14% |

These readings generally indicate that the moisture content of the logs is elevated where logs are in contact with soil and that the interior moisture content is sufficiently high to support fungal and other modes of biological deterioration of the wood.

Qualitative Resistance Drilling

About 85% of the exposed vertical logs of the north and south elevations were resistance-drilled from the interior slightly above grade. This simplified qualitative technique allows an experienced investigator to identify potential voids or soft spots in a wood member. Drilling was performed with a $^{1}/_{8}$-inch-diameter wood drill bit to a depth of about one-half of the diameter of each log. In places where voids were found, further drill holes were made higher up in the log to determine the height of the void or deterioration.

Three hollow logs were found on the north elevation, and five hollow logs were found on the south elevation (Figure 4). There was not a direct correlation between moisture content levels and hollow logs.

***Stone Masonry Foundations***

At the east end wall, the poteaux-en-terre logs have been modified to bear on a stone masonry foundation; the west end wall has been reconstructed as a frame wall on a stone masonry foundation. The stone and mortar were in good condition, without significant weathering, debonded mortar joints, or other evidence of distress or deterioration. The stones currently in place appear to be the same as those documented in the 1936-1940 HABS photographs, but the walls have since been heavily repointed on both interior and exterior faces.

P13. First-floor structure, viewed from the caveau, showing original log joists, masonry piers with limewash, and shoring.

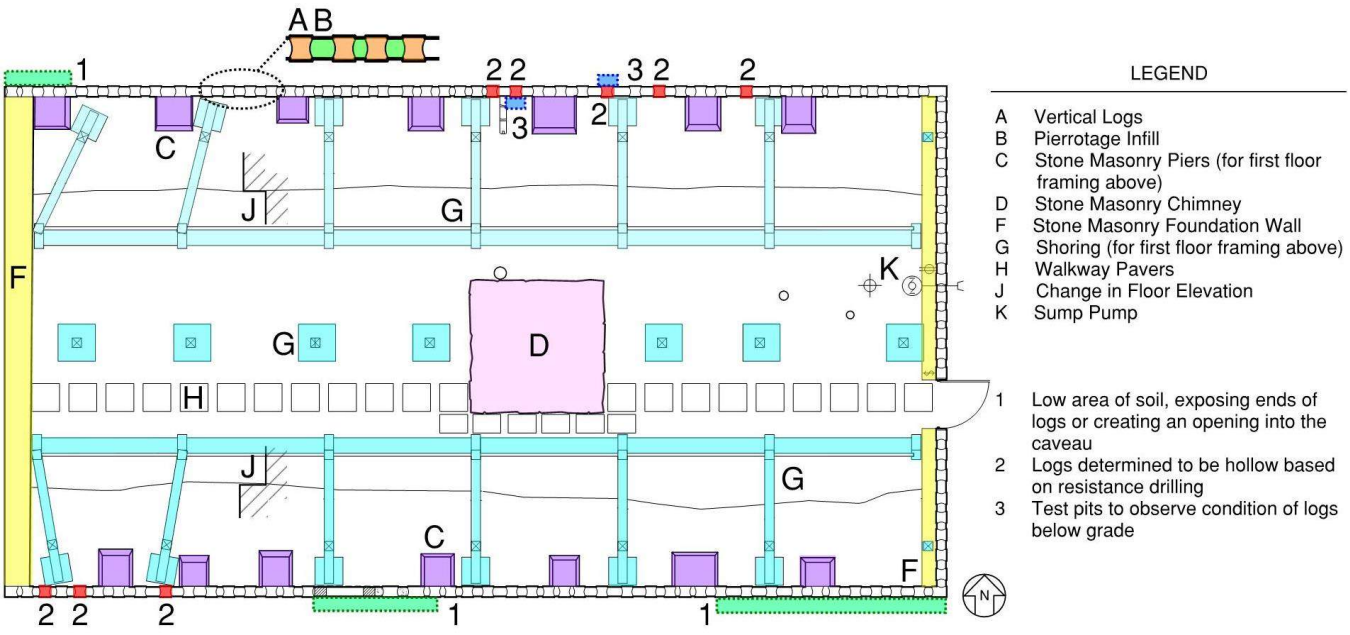



Figure 4. Caveau floor plan.

***First-Floor Structure***

Description of Existing Construction

The first-floor structure is constructed of large oak logs as joists, some with bark and some semi-hewn (Photograph P13). These joists span the full width of the structure in the north-south direction but are not engaged with the vertical log walls, like at the Bequette-Ribault House. Rather, they bear on a hewn timber beam that spans across stone masonry piers adjacent to the interior side of the vertical logs (Figures 5 and 6), making the floor structural system independent of the wall and roof structural system. Three of the joists are supported on one end by the timber beam, and the other end is pocketed into the stone masonry chimney stack. It is believed that the joists were installed prior to the erection of all the vertical log walls and that the tops of the joists were hewn in place to render level support for the original wood floorboards (no longer extant).[9] Multiple supplementary joists have been added between original log joists and some original joists may have been replaced (Figure 6); these supplementary joists are composed of a combination of reclaimed timbers and semi-hewn logs and appear to have been installed at various points in time. The newer joists are typically spliced at their midpoint and supported by the longitudinal shoring beam.

Condition Assessment

The log joists are in "poor" to "failed" condition from insect and fungal decay, meaning that the original

P14. Deteriorated original log joists.

[9] Luer and Frances, *Vanishing French Heritage*, 78-79.

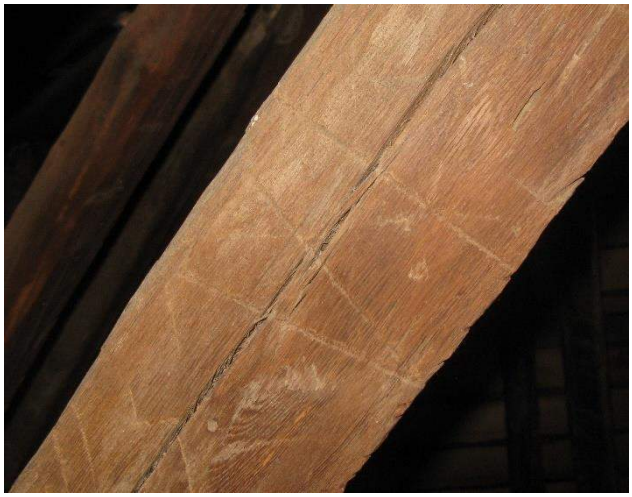
P15. Replacement joist with splice at longitudinal shoring beam.

P16. Approximately every other beam supports with a roof truss.

floor framing members have little to no structural capacity remaining (Photograph P14). Extensive shoring in the caveau now provides five bearing supports for most joists, as opposed to the original two end supports adjacent to the north and south walls. The original log joists have been supplemented with several new members, which are spliced over the middle line of the shoring (Photograph P15). The shoring consists of a combination of vertical wood posts and metal screw adjustable posts and was reportedly installed after the damage from the Great Flood of 1993. No active termite infestation was observed, but it was not possible to determine whether powder post beetle or other insect infestations are active.

Photograph P17. Mortise connection at truss collar tie with protruding tenon and trenail.

P18. Carpenter's mark showing Roman numeral II on truss top chord.



P19. Carpenter's mark showing Roman numeral VI on truss top chord.

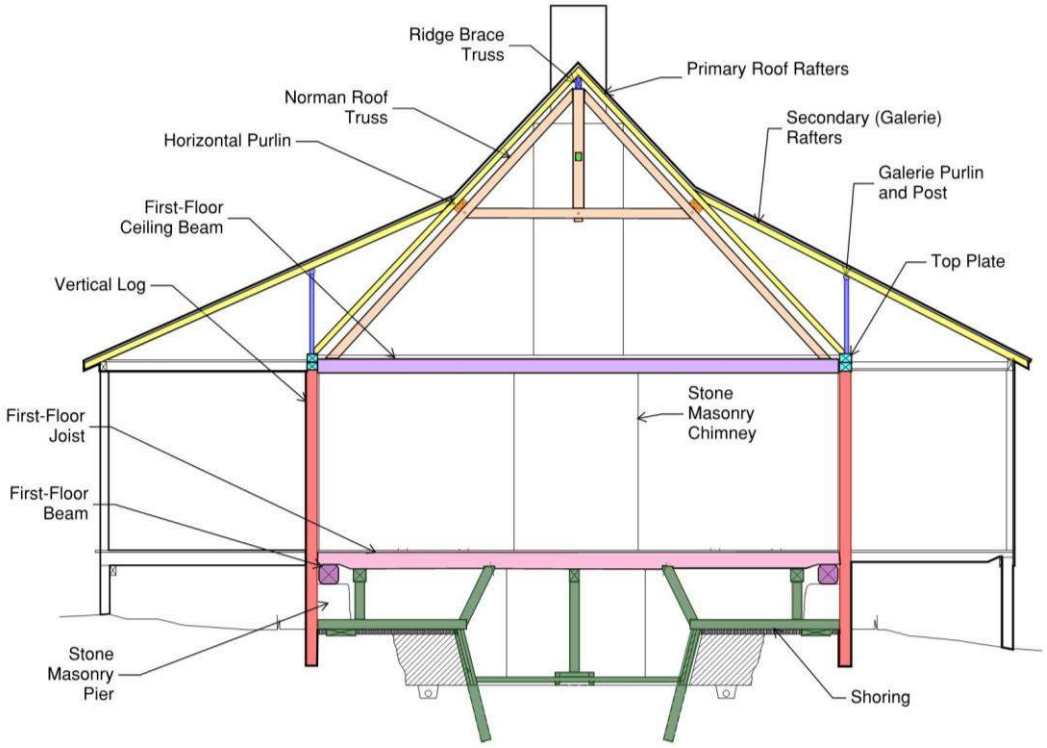



Figure 5. Transverse section looking west, showing framing members (based on Missouri DNR drawings).

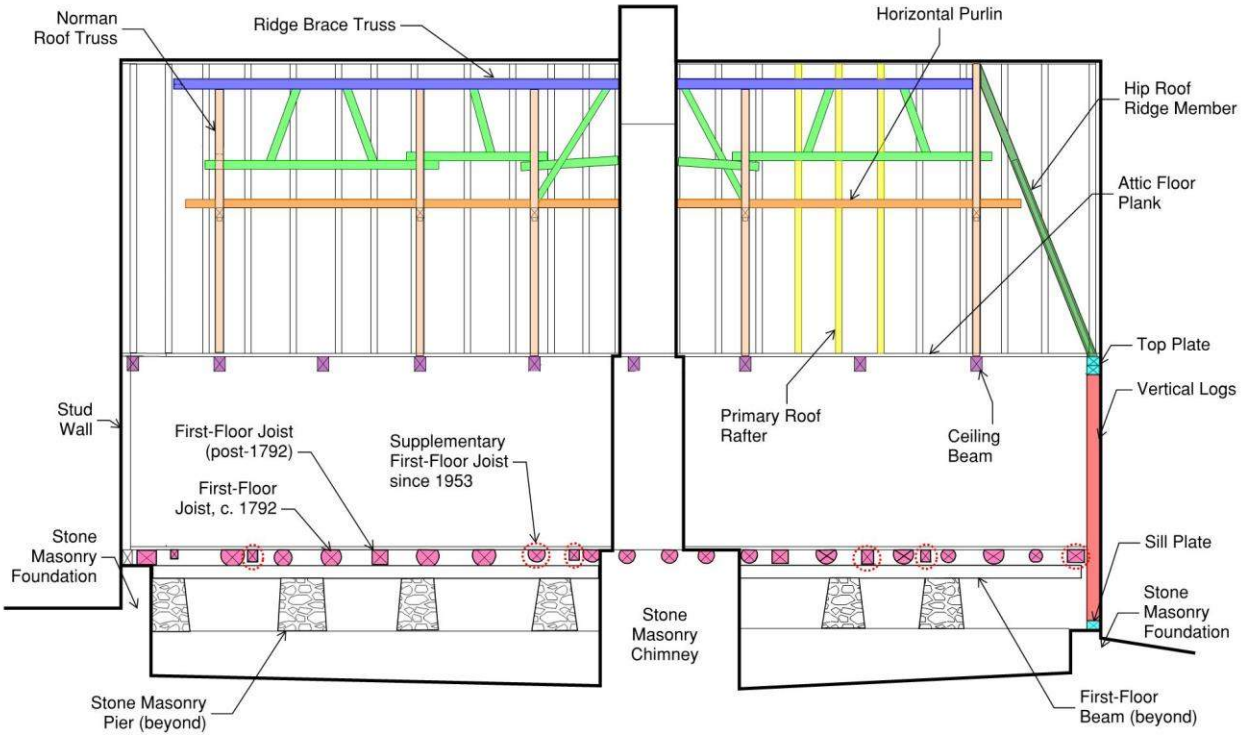



Figure 6. Longitudinal section looking north, showing framing members (based on Missouri DNR drawings).

P20. C. 1792 rafters at the main roof with horizontal purlin. Note the trenail purlin splice.

P21. Connection of primary rafter to upper top plate with a forged nail.

P22. East end wall, showing hipped roof framing members still in place.

Discussion

There has been considerable downward movement of the first-floor level that is caused by relative settlement between the brick piers and chimney stack, as well as significant deflection of the log floor joists. A laser level survey was performed on the first floor to better understand these phenomena and serve as a benchmark to quantify future differential settlements. It is apparent that the stone masonry chimney stack is the most stable vertical bearing element and has been prone to the least settlement. A more detailed discussion of the laser level survey and the results is included below.

***Roof Structure***

Description of Existing Construction

The construction of the c. 1792 roof framing includes roof trusses, roof ridge bracing trusses, a horizontal purlin, primary rafters, and ceiling beams. See Figures 1, 3, 5, and 6 for diagrams of the roof structure.

- The five roof trusses are Norman-style trusses: triangular-shaped with a vertical king post, a horizontal collar tie, and diagonal top chords.
- The trusses bear directly on the first-floor ceiling beams that span between the north and south vertical log walls (Photograph P16 and Figure 5).
- The trusses spacing varies between approximately 10 feet to 12 feet on-center, except Trusses III and IIII, which are spaced approximately 5 feet 4 inches on-center.
- All truss members are hand-hewn from red or white oak, and as such, their dimensions vary. The truss top chords are nominally 5 x 5 inches, the king posts are nominally 6 x 5 inches, the horizontal collar ties are nominally 7 x 5 inches, and the first-floor ceiling beams are nominally 8.5 inches x 5 inches at the ends and 10.5 x 5 inches at the midspan.
- The truss members are connected by mortise and tenon connections and secured with *trenails*. One trenail was typically used; only one location at Truss V has two trenails at the connection between the king post and horizontal collar tie member. The horizontal collar tie-to-top chord and king post-to-horizontal collar tie connections each have full-depth mortises with protruding

P23. Hipped roof framing members connected with forged nails.

tenons (Photograph P17). The connections between the top chord and the ceiling beam and the king post have partial-depth mortises.

- Each truss member has a carpenter's mark in Roman numerals, indicating the trusses were fabricated on the ground and assembled in place, piece by piece. The first truss from the reconstructed west stud wall was marked as Roman numeral II (Photograph P18), indicating it was originally the second truss from the west, and the easternmost truss was marked as Roman numeral VI (Photograph P19). Therefore, it appears there were originally six trusses, and the west stud wall was constructed between the original first and second trusses.

If the truss spacing between Trusses I and II was similar to that of the other trusses (10 to 12 feet), and the hip framing dimensions were similar to that of the east end, approximately 8 to 12 feet of the original building was removed from the west end, which supports the conclusions of the 1996 archeological survey.

- The c. 1792 roof rafters are hewn, roughly shaped members (Photograph P20), spaced nominally 24 inches on-center but ranging from as little as 18 inches to as much as 28 inches. The rafters vary in size but average approximately 4.5 x 3.5 inches. The rafters are connected together at the ridge with a single horizontal trenail and bear on the ridge beam. The members span from the roof peak to the top plate, with midspan support from the horizontal purlin, which spans

Figure 7. Diagram of missing ridge brace truss members (in white) at cut end of ridge beam at west.

longitudinally across the roof trusses. The bearing ends of the rafters may be mortised into the top plate and are also secured with one wrought nail, toenailed through the rafter end into the upper top plate member (Photograph P21).

- The c. 1852 roof rafters for the galeries align with the primary rafters and are attached just below the purlin with cut nails. The rafters are roughly shaped and hewn flat on the top face. A horizontal purlin on posts provides midspan support; many of the posts appear to be replacements.
- The original hip roof construction, including the ridge rafters and common rafters, is present at the east end of the attic (Photographs P22 and P23).
- At the west end, the ridge beam has been partially removed. The cut end shows evidence of a mortise connection, likely for one of the diagonals for the ridge brace truss (Figure 7). Along with the carpenter's marks on the trusses and this missing hip framing at the west end, this fragment is clear evidence that the House originally extended further to the west than the existing footprint.

Condition Assessment

The existing roof framing members are individually generally in "good" condition, but localized distress conditions are negatively affecting the structural stability of the roof framing.

- The wood is generally in good condition, considering its age. The oak used for the truss members was obviously selected for its high

P24. Termite damage at Truss IV, south bearing, Note the displacement of the rafter bearing (left) and the displacement of the top plate to expose the dovetail end of the ceiling beam.

P25. Truss VI, south bearing, exhibits termite damage within the truss top chord and first-floor ceiling beam end.

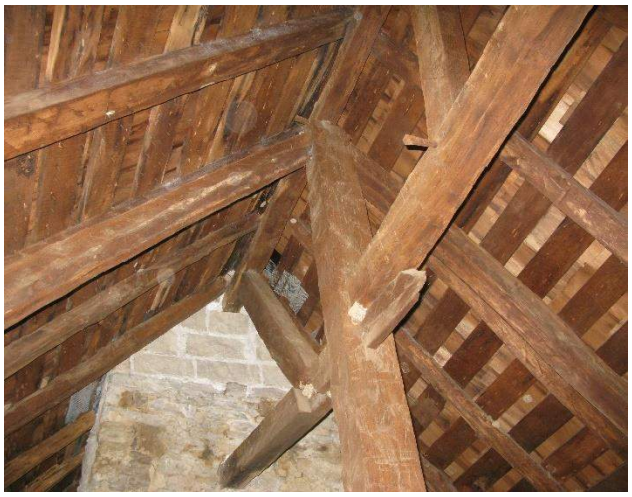
quality. Very few knots are present, and no splits were observed, and the wood has little to no slope of grain. Except where distressed by outside conditions, like settlement or insect/water damage, the truss members are nearly in their original condition, without warping, splitting, or shrinkage.

- Past termite damage is visually apparent in several trusses at the top chord-to-ceiling beam connection, where the beam dovetails into the double top plate. The loss of section is visually apparent more within the first-floor ceiling beam than the sloped top chord (Photographs P24 and P25). No active termite activity was observed.
- Several roof trusses exhibit displacement at their bearing ends.
- The horizontal ridge beam is connected to the top of the truss king posts (Figures 5 and 6) and is pocketed into the reconstructed upper portion of the stone masonry chimney. The bottom chord of the ridge brace truss is supported by the original stone masonry portion of the chimney and a mortise and tenon connections within the king posts (Photograph P26).
- On the west side of the chimney, the lower half of the diagonal bracing member between the chimney and Truss IIII is missing (Photographs P27).
- On the east side of the chimney, the bracing member between the chimney and Truss V is cracked (Photographs P28). This damage appears to be related to the differential settlement of the exterior walls (and subsequently, the trusses) relative to the chimney, which has not settled.
- Water damage is present at the top of the king post at Truss VI, where the hip framing connects with the primary roof. The king post at Truss VI extends above the ridge beam, supporting the belief that the end trusses had finials that originally penetrated the roof (Photograph P29). The damage at this location is significant, with deterioration of the trenail connection and material loss of the structural wood members.
- At the attic floor, the wood planks are damaged and loose around the chimney, creating an unsafe walking surface (Photograph P30). The vertical displacement of the attic floor is pronounced.

Qualitative Resistance Drilling

Qualitative resistive drilling was performed on the first-floor ceiling beams and sloped top chord adjacent to the beam connection to identify potential interior decay within the members. Significant insect damage was found at six truss bearing points based on the resistance drilling (Photograph P31).

It was found that the insects traveled within the timbers without exposing themselves to the outside. This type of damage is concealed from view and not able to be assessed visually. No active insect activity was observed during our visit. See section "Pest Damage" for further discussion.



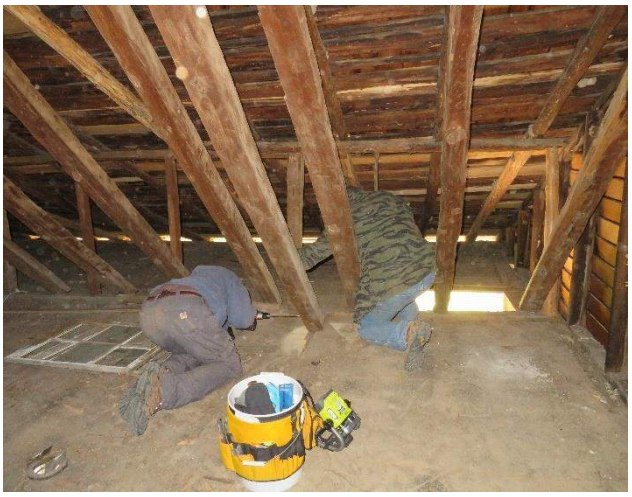
P26. Ridge brace truss connection on the west side of the stone masonry chimney.

P27. Roof ridge brace truss at east face of the chimney. Note the vertical displacement and missing lower portion of the diagonal bracing member.

P28. Cracked bottom chord member at west side of chimney.

P29. Water damage to the Truss VI king post and other framing members at the ridge.

P30. Displaced and missing attic floor planks. Note the effect of the differential settlement on the floor level around the chimney.



P31. Resistance drilling into wood members to detect insect infestation damage.

Discussion

While several galerie rafters did appear to be modern replacement members, the framing of the c. 1792 roof appeared to be in its original condition. One or two members of the ridge brace trusses may be replacement members, but the Norman truss members, purlins, and rafters all appeared to be original fabric. Despite a long history of alterations, the c. 1792 roof structure retains extraordinary integrity and the c. 1852 galerie roof structures retain substantial integrity.

The roof structure is under stress due to localized deterioration of connections and differential settlement of the exterior walls relative to the chimney. The 2007 restoration work performed by the Missouri DNR included resetting the displaced ridge beam and partial reconstruction of the stone masonry chimney. This work reduced the visible deflection of the roof ridge when viewed from the exterior but did not address the underlying cause of the differential settlement. Some differential settlement would be normal and expected for a structure of this age. A comparable level of minor differential settlement can be seen in the attic floor in the 1986 HABS photographs and in the photos taken in the early 1990s published in *Vanishing French Heritage*. The severity of the differential movement between 1986 and today was reportedly accelerated by the Great Flood of 1993.

## LEVEL AND TOP PLATE SURVEYS

Level and top plate surveys were performed using a Bosch GCL 2-160 self-leveling cross-line laser mounted on a tripod. When properly leveled, the device emits horizontal and vertical laser planes allowing the user to measure floor levels at various points relative to the horizontal laser plane and other elements, such as top plates relative to the vertical laser plane.

### *First Floor Survey*

A level survey was performed on the topside of the first floor to understand the deflections and differential settlements within the first-floor structure and establish a benchmark for long-term monitoring (Figure 8). It should be noted that the first floor is supported by stone masonry piers within the caveau separately from the exterior walls and roof framing.

- The level survey indicates generally, the floor east of the chimney is approximately 2 to 3 inches lower than the floor adjacent to the chimney. This indicates that the stone masonry piers for the first-floor framing have settled relative to the stone masonry chimney.
- The floor west of the chimney exhibits less settlement along the north and south walls.
- Furniture and other interior obstructions interfered with readings along the west wall.

### *Attic Floor Survey*

A levelness survey was performed within the attic to understand the relative movement between the vertical log walls and the center stone masonry chimney, the deflection of the first-floor ceiling beams, and to establish a benchmark for long-term monitoring (Figure 9). Since some ceiling beams are supported by both the exterior wall vertical logs and the center stone masonry chimney, the differential elevations should be a strong indicator of the settlement of the exterior wall vertical logs.

- The greatest area of floor deflection occurs around the stone masonry chimney, where the differential elevation is as much as 4 to 5 inches higher compared to the exterior walls. This is supported by visual observations of displaced and damaged attic floor planks. These measurements further support the level survey at the first floor, showing differential settlement between the chimney and the exterior walls.
- At the eastern half of the attic, deflection of the ceiling planks is shown in deep red. These planks deflected under foot traffic and should be avoided when accessing the attic.
- The relative high points along the east and west walls may be related to the later alterations that added limestone foundations.

### *Top Plate Survey*

A plan survey was performed on the top plates at the north and south exterior walls to understand the relative lateral (outward) movement of the top plates (Figure 10).

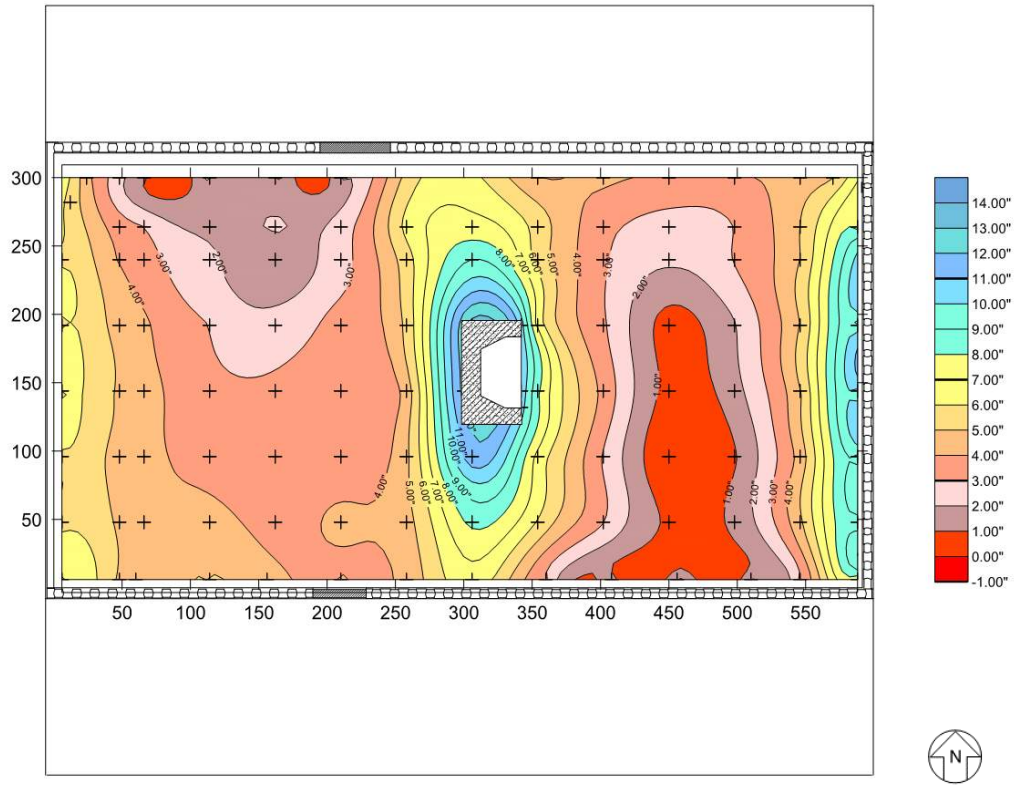



Figure 8. Attic Floor Plan Level Survey.

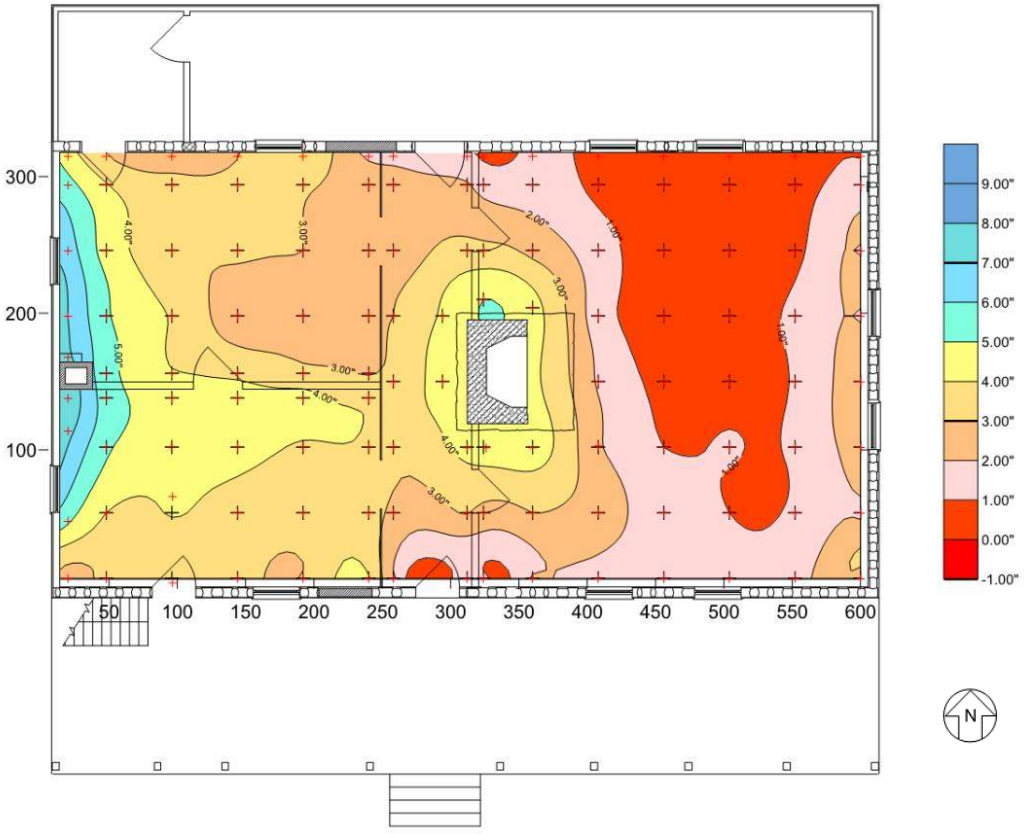



Figure 9. First Floor Plan Level Survey.

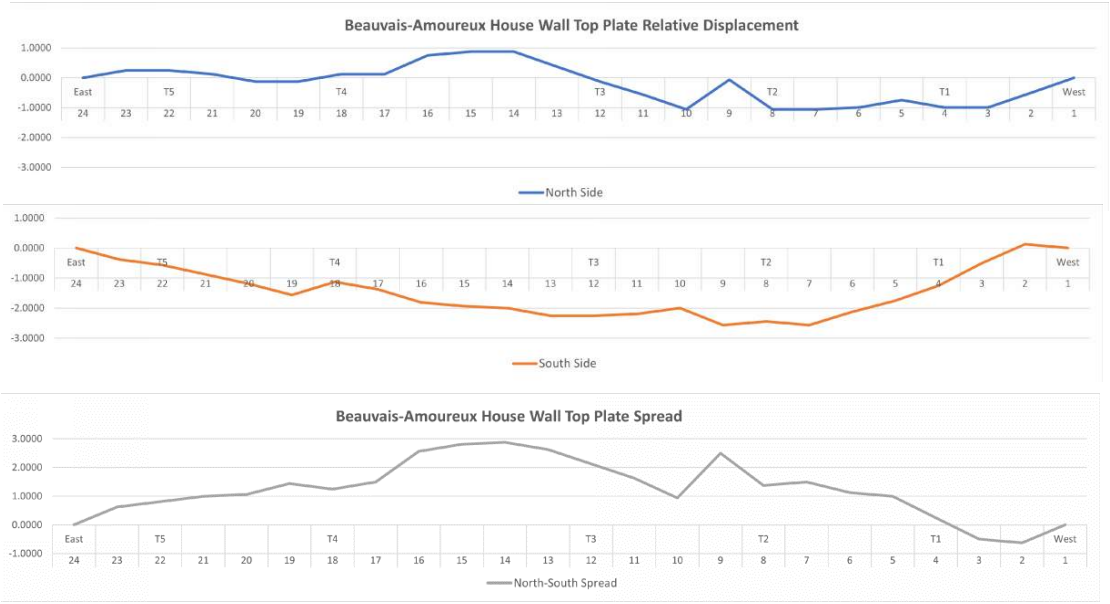



Figure 10. Top Plate Plan Survey, showing relative displacement in inches, from east to west. Positive values indicate outward displacement and negative values indicate inward displacement.

- The survey measured a significant outward bowing on the south side. This would indicate that the Norman roof trusses are sagging (and consequently spreading), and the rafters are sharing the roof loads, causing the top plates to displace outward.
- The top plate is constructed of two wood members. At the north, the upper top plate member was also observed to have a torsional deformation (twisting or rotation) that would also be caused by the spreading of the trusses and roof rafters.

P32. Concealed insect damage demonstrated by a timber fragment found in the grenier.

The results of the plan survey support other observational evidence that the trusses are distressed, due in part to the differential settlement of the exterior walls and in part to the insect damage to the truss-to-ceiling beam bearing connections. The spread of the trusses is redistributing roof loads to rafters in eccentric and unintended load paths. This distress is also contributing to the rotation of the bearings ends of at least one truss member and several c. 1792 rafters and are likely putting additional stress on the original trenail and wrought nail connections between roof members.

## PEST DAMAGE

### *Insect Damage*

Damage to wood structural members caused by various wood-boring insects was documented during the physical investigation. No live insects were observed, and no entomological analysis was performed within the scope of the structural assessment to verify insect species. In some cases, the damage observed followed well-recognized patterns of insect activity; in other cases, it may be

possible that multiple insect vectors are responsible for the damage observed.

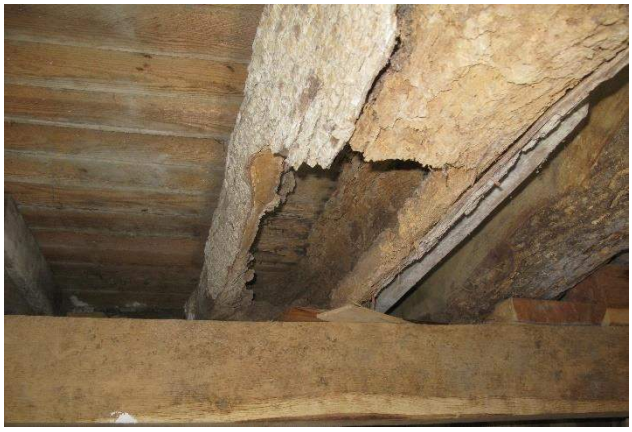
In many cases, the extent of damage from insects to the wood structural members was not visible from visual observation alone, as evidenced by a timber fragment found in the grenier (Photograph P32). It is unclear where this fragment originated, but concealed insect damage is well demonstrated by the loss of section visible in the fragment cross-section.

Termites

Four species of termites occur naturally in Missouri. All these species are closely related and belong to the genus *Reticulitermes.* All of Missouri's native Reticulitermes termites are subterranean.[10] Subterranean termites live in colonies below ground and only enter into a wooden structure to feed. When above ground, they construct mud tubes as a link between their food source and colony, which protect them from predators and dry air. The clay infill of the pierrotage construction allows termites to propagate to the interior wood members at elevated floors without detection. Termites eat the wood cellulose, which weakens the rigidity and strength of the wood members. Because termites do not prefer cedar, the damage was most severe at oak members. No termite damage was observed on the cedar vertical logs.

Termite damage to the floor's joists is severe (Photograph P33). Some logs were observed to be completely hollow, with only the bark remaining. Without the extensive shoring installed in the 1990s, the first-floor framing may have collapsed (Photographs P34).

Areas of termite damage were also observed at roof truss members, particularly the bearing connections of multiple truss top chords to the ceiling beams. Although much less pronounced than the conditions observed in the caveau, termite damage in the attic has had a negative impact on the structural stability of the trusses.



P33. Termite damage of floor joist.

P34. Caveau shoring, south half of basement. Note wood beam shoring line along south wall and midspan of basement, as well as diagonal members.

P35. Powder post beetle damage of caveau floor joists.

[10] Richard M. Houseman, "Subterranean Termites," University of Missouri – Columbia, Department of Entomology, https://extension.missouri.edu/publications/g7420. Accessed March 28, 2021.

Powder Post Beetles

Powder post beetles are within the group of wood-eating beetles referred to as "woodworm" because they spend several years as grubs tunneling through the wood before they depart as an adult beetle. The wood that they inhabit was sometimes colonized before the tree was felled; thus the structure may have been infested from its initial construction. The adult beetle lays its eggs in crevices in the timber, with larvae emerging soon afterward, eating their way through the timber for the next several years. Eventually, pupation will occur in chambers just below the surface. The adult beetle emerges from the timber through an exit hole or "flight hole." A mating flight then follows, and, subsequent to mating, the female seeks out a suitable place to lay eggs, and the cycle begins again.[11]

This cycle may take place over and over again within the protected confines of the affected structure. This is a long-term infestation and has caused significant structural damage but has been mostly confined to the outer 2 inches of the affected logs (Photograph P35). As previously mentioned, it was not possible to determine whether woodworm infestation was active during our visit. Woodworm activity could be determined during the mating season in midsummer.

Carpenter Ants

Carpenter ants are another common wood-destroying insect, with five species occurring in Missouri. Unlike termites, carpenter ants do not feed on wood but carve out large areas of interconnected tunnels, called galleries, as nests, which are generally clean of wood pulp and frass. Carpenter ants prefer wood with a high interior moisture content and will infest wood that has been damaged or decayed by fungal activity or other insects. Damage from carpenter ants can be significant in structural members, and winged females will leave their parent colony to establish satellite colonies in nearby members.[12]

Like termite damage, carpenter ant damage may be concealed within the interior of a structural member and not readily visible to the naked eye. No evidence of active carpenter ants was observed during the physical investigation. In some cases, it may be difficult to differentiate the damage caused by termites compared to that caused by carpenter ants.

P36. Trim at the south galerie with insect and squirrel damage.

***Animal Damage***

Damage from larger animal pests was also observed at the House. Common animal pests in Missouri include squirrels, mice, and rats, burrowing animals like groundhogs, birds, and bats. Controlling damage from animal pests is typically approached through sealing potential entry points, eliminating attractive nuisances like overhanging trees or woodpiles, and performing regular inspections for signs of infestation. Cruelty-free repellant treatments like ultrasonic devices, ammonia-based repellants, and predator urine are often anecdotally described as effective, but in practice, may have limited or inconsistent success. No active animal infestations were observed, but park staff reported ongoing issues with squirrels and groundhogs, specifically.

Squirrels

Damage likely attributable to squirrels was observed at wood fascia boards, wood trim, and along the edges of roof shakes where the wood had been gnawed, and also occasionally, holes had been chewed entirely

[11] Richard M. Houseman, "Wood-Boring Beetles," University of Missouri – Columbia, Department of Plant Sciences, https://extension.missouri.edu/publications/g7422. Accessed March 28, 2021.

[12] Richard M. Houseman, "Carpenter Ants," University of Missouri – Columbia, Department of Entomology, https://extension.missouri.edu/publications/g7423. Accessed March 28, 2021.

through the wood (Photograph P36). Attics are attractive nesting locations for squirrels; this is especially true for a structure that is not permanently occupied. Controlling squirrel damage is best performed through controlling access to the roof by keeping tree limbs and other climbing paths trimmed and by closing off entry paths into the attic.

At the Beauvais-Amoureux House, the open soffit into the south galerie roof has wire between the rafter tails, but this may provide only limited control for squirrel infestation. Regular inspection and maintenance are needed to repair damage caused by squirrels and to seal any entry points into the structure that may be created. Controlling entry points for squirrels will also prevent entry of birds and bats.

P37. Suspected animal burrow hole into caveau under the south galerie.

Burrowing Animals

Along the foundation walls at the north and south elevations, several low spots or holes appeared to be animal burrows (Photograph P37). Multiple burrowing animals are native to this area of Missouri, including groundhogs, which may alternately be called woodchucks or marmots. Groundhogs are aggressive diggers who can easily also burrow through the deteriorated ends of the vertical logs to gain access to the caveau. If deterrent methods are ineffective, below-grade barriers in the form of heavy wire mesh may need to be considered.

P38. Cementitious material aggregate after the sample was placed in a dilute muriatic acid solution, showing river sand at 100x magnification.

## LABORATORY STUDIES

Laboratory studies were performed on samples of several materials from the House. Techniques employed included analysis with reactive chemicals, sedimentation analysis, and microscopic examination.

### *Cementitious Material*

A cementitious material was placed between the logs on the exterior side of the south wall just above grade and below the galerie. This was an apparent alteration or repair to the original pierrotage. The sample of the cementitious material was placed in a dilute muriatic acid (hydrochloric acid, HCl) solution, which produced an immediate bubbling reaction that completely consumed the binding paste, leaving only the aggregate. This reaction is consistent with a binder of calcium carbonate ($CaCO_3$, lime) and the release of carbon dioxide ($CO_2$) gas. The aggressive nature of the bubbling indicated that the mixture has a high lime content with little to no portland cement. This alteration appeared old and could have occurred any time within the nineteenth or early twentieth centuries. The aggregate that remained was a well-graded river sand (Photograph P38).

### *Clay Binder, Parging, and Nearby Soil*

Samples of the binder in the pierrotage and the parging were removed for qualitative sedimentary analysis. The samples were only removed from areas

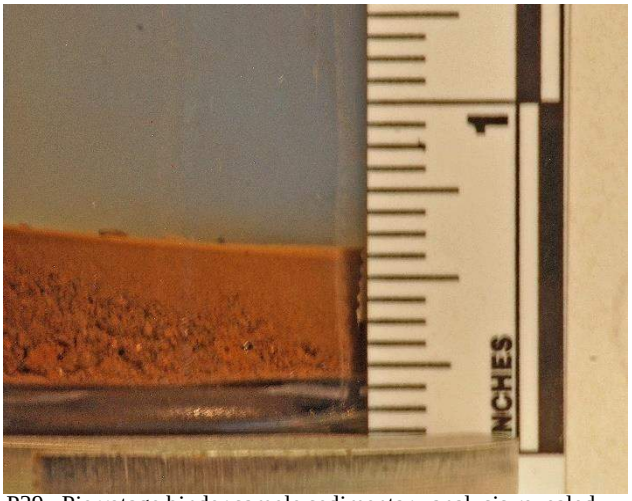
that were already debonded. A sample of the soil to the southeast and within 10 feet of the House and about 1 foot below grade was also removed for comparative analysis.

Sedimentary analysis is a way to determine a soil's texture. This type of testing is used in areas of the world where earthen construction is common and assists with developing appropriate soil textures for rammed earth and adobe construction, as well as selecting appropriate clay mortars.

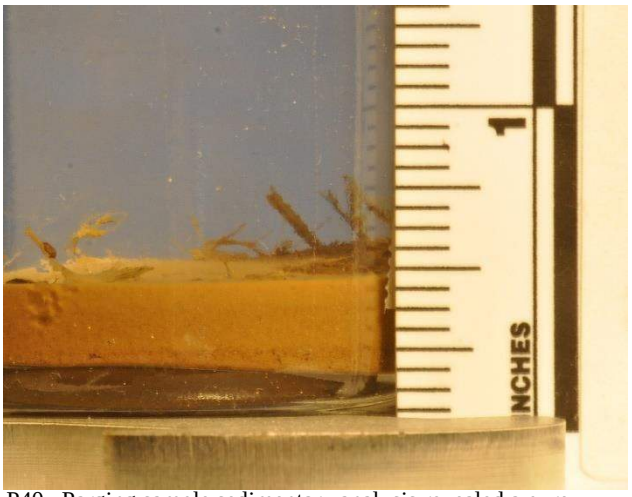
A soil's texture is determined by the mineral particle sizes it contains, as well as the content and composition of contributing organic matter. For soil minerals, sand (2.00 to 0.05 mm in diameter), silt (0.05 to 0.002 mm), and clay (smaller than 0.002 mm) are the predominant particle sizes and are derived from rock that has broken down over thousands of years by climatic and environmental action. Mineral particles are carried and naturally sorted by waterways, which deposit these particles on their beds and banks over thousands of years. Sand will quickly settle due to the larger particle size, while slits and clays remain suspended longer and settle farther away from the bank in overflow events. The banks of the Mississippi River would be an ideal place for quarrying appropriate sands and clays for building construction. For construction purposes, the smaller the mineral particles, the more impermeable the soil becomes, such as soils with heavy clay content. Sand in the soil, like in concrete, will help to control shrinkage. The ratio of particle sizes affects the appropriateness of their use in construction for pierrotage, bousillage, and parging, a phenomenon no doubt well understood by the early French settlers.

For the sedimentary analysis, material samples were broken apart and placed in a clear jar with clean water. The jar was shaken vigorously until the sample was completely suspended. Over a three-day period, the jars were allowed to sit undisturbed, and the soil particles settled into strata, with sand particles settling first at the bottom, silt next, and finally the clay at the top. Organic matter stayed in suspension, floated to the top, or settled on top of the clay layer.

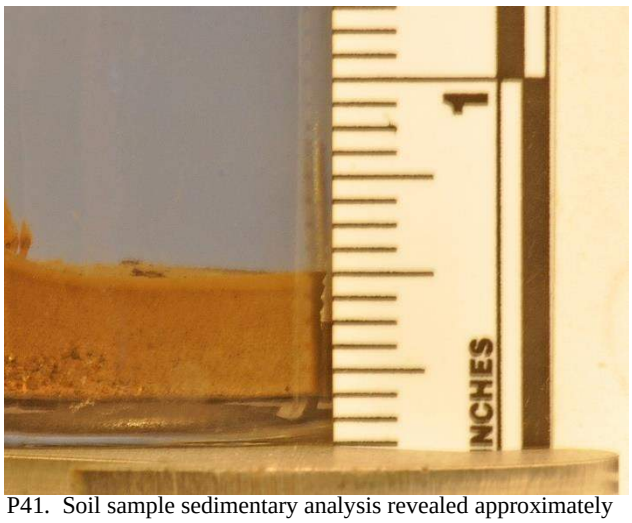
- The clay binder of the pierrotage was found to contain a mixture of about 25% sand and 75% clay/silt. Insignificant amounts of organic matter were detected (Photograph P39).



P39. Pierrotage binder sample sedimentary analysis revealed approximately 25 percent sand and 75 percent clay/silt.



P40. Parging sample sedimentary analysis revealed a pure mixture of clay/silt with some vegetative material used as reinforcing.



P41. Soil sample sedimentary analysis revealed approximately 25% sand and 75% clay/silt.

- The parging was found to contain a pure mixture of clay/silt. It also had significant amounts of organic matter in the form of straw (Photograph P40).
- The soil was found to contain a mixture of about 25% sand and 75% clay/silt. Though a bit darker in color than the pierrotage binder, the textural comparison between these two samples was the same (Photograph P41).

The pierrotage binder is believed to be from the original construction. Its similarity in texture to the soil from the vicinity of the House would indicate that the clay could have been quarried on site. It is doubtful that the parging is original but was rather a maintenance technique; this is supported by 1937 HABS photographs which show the exterior walls below the galeries were at one time covered with stucco on wood lath, which based on historic photography was common practice for treating exterior walls of log structures in Ste. Geneviève in the nineteenth century. The analysis suggests that the pure clay/silt mix was carefully chosen because of its compatibility with the clay binder and that the straw was added to control shrinkage.

***Whitewash***

Samples of the whitewash were removed from the parging on the outside of the south vertical log wall above grade and below the galerie. Samples were removed only where the whitewash that already become detached from the parging. It was noted that the whitewash debonded at the whitewash/parging interface and not within the body of the parging. A sample of the whitewash was placed in a dilute HCl solution, which had an immediate bubbling reaction that completely consumed the sample. The whitewash was likely lime without added Portland cement, and the bubbling reaction was a release of $CO_2$ gas. Unfortunately, this analysis provides no clue as to the age of the whitewash.

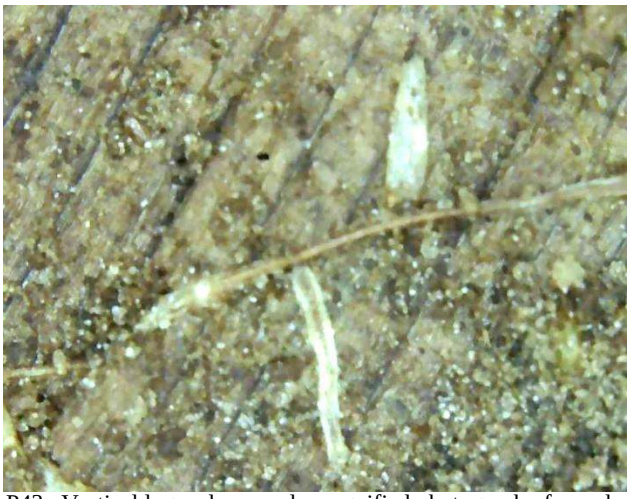
***Decayed Cedar Wood***

Samples of decayed cedar wood were removed from below grade at the northwest corner of the building where a hole in the ground already existed, and the bases of decayed logs were exposed. No evidence of insect damage was observed.

The samples were broken and examined using a 50X to 100X digital handheld microscope. Evidence of wood rot, which is a fungal growth, was evident by the presence of hyphae (filaments) and lower-level plant growth (Photographs P42 and P43).

If wood is exposed to long-term moisture or repeated wetting and drying, the moisture can allow biological growth to occur, resulting in decay to the wood elements. This decay phenomenon is observed where the logs are below the ground or when in regular contact with moisture, such as a leaking downspout. When the moisture content rises above the fiber saturation point of the wood, the wood is prone to decay from fungal attack. The fiber saturation point is generally accepted to be about 30% moisture content, but as discussed above, levels higher than 20% can promote biological deterioration. Locations

P42. Vertical log cedar sample magnified photograph of wood decay (fungal growth).



P43. Vertical log cedar sample magnified photograph of wood decay (fungal growth).

at the base of the logs with localized, elevated moisture content compared to logs in other areas should be a cause for further monitoring.

## WOOD SPECIES IDENTIFICATION

A robust program of wood species identification was performed as part of the 1986 dendrochronology analysis, which identified species from 7 samples taken from the Beauvais-Amoureux House, 16 samples from the Vital St. Gemme Beauvais House (poteaux-en-terre of similar date and construction methodology), 21 samples from the Bequette-Ribault House (also poteaux-en-terre but of slightly later date), and 99 samples from 21 other log structures in Ste. Geneviève.[13]

Of the three poteaux-en-terre structures, the exterior wall logs were found to be uniformly constructed from red cedar, while truss members and beams were found to be white oak. *Poteaux-sur-sole* structures contemporaneous with the Beauvais-Amoureux House were more commonly found to have wall logs of oak, likely because the logs were not in direct contact with the earth.

To support the 1986 wood species identification, a further 23 samples were taken from various structural members of the Beauvais-Amoureux House as part of the 2020 physical investigation. Samples were removed from vertical logs, truss members, ceiling beams, joists, purlins, rafters, and other members.

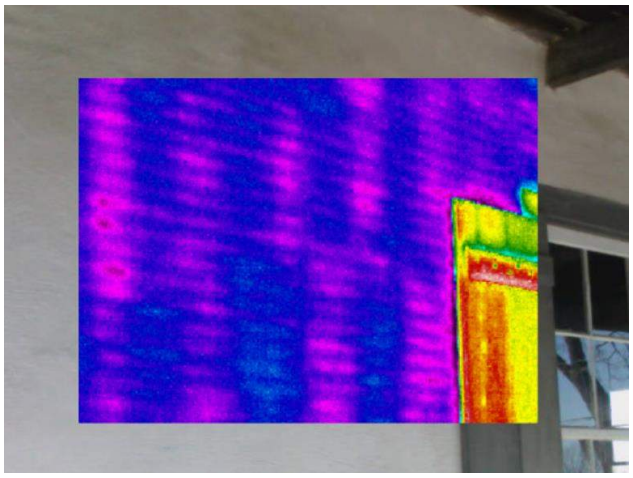
See Table 3 for wood species identification by sample.

[13] Guyette, "Tree Ring Dating."

| Table 3. Wood Species Identification | | | | |
|---|---|---|---|---|
| **Member** | **Location** | **Construction Date** | **2020 Assessment[1]** | **1986 Dendro[2]** |
| ***Roof Trusses*** | | | | |
| Truss Collar | Not given (1 sample) | c. 1792 | --- | White Oak |
| King Post | Truss II | c. 1792 | Red Oak | |
| Top Chord | Truss III | c. 1792 | White Oak | |
| Top Chord | Truss IIII | c. 1792 | Red Oak | |
| King Post | Truss IIII | c. 1792 | Red Oak | |
| ***Roof Rafters*** | | | | |
| Roof Rafter | | c. 1792 | Hardwood, Black Cherry | |
| Roof Rafter | North Slope | c. 1792 | Hardwood, Black Walnut | |
| Roof Rafter | North Slope | c. 1792 | Hardwood, Black Cherry | |
| Roof Rafter | South Slope | c. 1792 | Hardwood, Black Cherry | |
| Roof Rafter | | c. 1792 | Hardwood, Beech | |
| Galerie Rafter | North Slope | c. 1852 | Cedar | |
| Galerie Rafter | South Slope | c. 1852 | Cedar | |
| Galerie Rafter | | c. 1852 | Southern Yellow Pine | |
| Galerie Rafter | North Slope | c. 1852 | Southern Yellow Pine | |
| Galerie Rafter | North Slope | c. 1852 | Southern Yellow Pine | |
| Galerie Rafter | South Slope | c. 1852 | Southern Yellow Pine | |
| ***Roof Members, Other*** | | | | |
| Horizontal Purlin | | c. 1792 | Hardwood, Maple | |
| Top Plate | | c. 1792 | Red Oak | |
| Ceiling Beam | Between Truss V and VI | c. 1792 | Hardwood, Black Walnut | |
| ***Floor Framing*** | | | | |
| Floor Joist | | c. 1792 | Red Oak | |
| Floor Joist | | c. 1792 | White Oak | |
| ***Wall Framing*** | | | | |
| Vertical Log | Not given (6 samples) | c. 1792 | --- | Red Cedar |
| Vertical Log | South Wall | c. 1792 | Cedar | |
| Vertical Log | North Wall | c. 1792 | Eastern Red Cedar | |
| Vertical Log | North Wall | c. 1792 | Eastern Red Cedar | |
| Vertical Log | North Wall | c.1792 | Cedar | |

Notes:
1. As sampled and identified as part of the scope of the 2020 structural assessment.
2. As sampled and identified by the University of Missouri in 1986, the dendrochronology report does not specify sampling location.

P44. View down south galerie from the east, showing plaster on south elevation.



P45. Infrared thermographic image of the south elevation, showing plaster on lath. Note the vertical logs and horizontal bracing can also be seen in this image.

P46. 1937 HABS photo, showing deteriorated plaster on lath below the south galerie.

## ENVELOPE ASSESSMENT

Unlike the structural systems, which retain a high level of integrity, much of the exterior of the Beauvais-Amoureux House is not historic.

### *Exterior Plaster*

The Beauvais-Amoureux House is oriented with the primary facade facing south. Above the south galerie decking, the exterior logs are finished with plaster on wood lath that is painted white (Photograph P44). The wood lath is not exposed but was confirmed using infrared thermographic imaging (IRT) (Photograph P45). The plaster is of an unknown age and generally in serviceable condition with only minor hairline cracking. No areas of potentially debonded or deteriorated plaster were identified through IRT or sounding with a rubber mallet.

The 1937-1940 photographs in the HABS collection (Photograph P46) show heavily deteriorated plaster on wood lath that is no longer extant at the exterior logs below the north and south galeries; this appears to have been a common treatment for vertical log structures in Ste. Geneviève in the mid to late-nineteenth century. Currently, the exterior logs are finished with a thin parge coat. The parging is in very poor condition (Photograph P47). In some areas, the parging appeared to have multiple coats of a white film-forming paint, while other areas appeared to have paint or limewash applied directly over the pierrotage and foundation logs.

P47. Parging, limewash, and paint surfaces below south galerie are in poor condition, exposing the original pierrotage.

### *Cedar Lap Siding*

Description of Existing Construction

The existing lap siding was installed in 2007 by the Missouri DNR to replace previous wood siding.[14] The siding is a combination of untapered boards at the east and west end walls and tapered boards at the enclosed north galerie. The siding boards are cedar, unpainted, have approximately 5-inch exposures, and appear to be installed over a single layer of asphaltic building paper. The building paper stops at the roof sill plate, exposing the boards in the attic.

The siding is secured with exposed nails. Nail patterns align roughly vertically and are spaced approximately 22 to 30 inches on-center horizontally, depending on the spacing of framing members or exterior logs. Siding nails are modern reproductions to resemble hand-wrought nails, approximately 2.5 inches long.

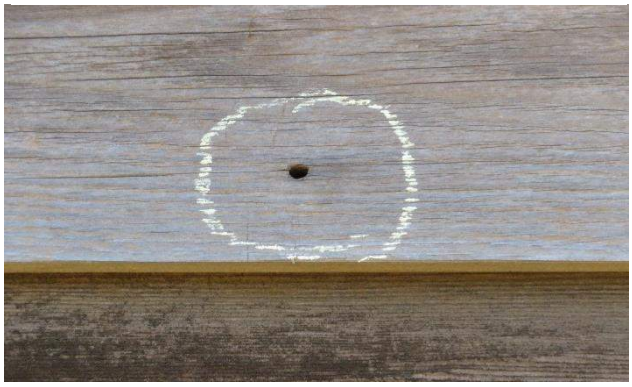
Condition Assessment

The existing siding boards are in "fair" condition, meaning that they are generally performing as intended but with limited remaining service life. Warping, splits, checks, missing nails, and loose boards were commonly observed (Photographs P48, P49, and P50). One missing board was observed on the east elevation. Several areas of animal damage to siding or trim boards were also observed.

Discussion

Based on historic narratives that describe the exterior treatment of French vernacular structures in Ste. Geneviève, the House was likely originally plastered and/or whitewashed.[15] By the mid to late nineteenth century, it appears that wood lap siding may have been commonly in use in Ste. Geneviève, as can be seen in early photographs, the Vital St. Gemme Beauvais House (Photograph P51) in the collection of the Missouri History Museum.[16] It is reasonable to

P48. Split siding board on west elevation.



P49. Missing nail at siding board on the west elevation.

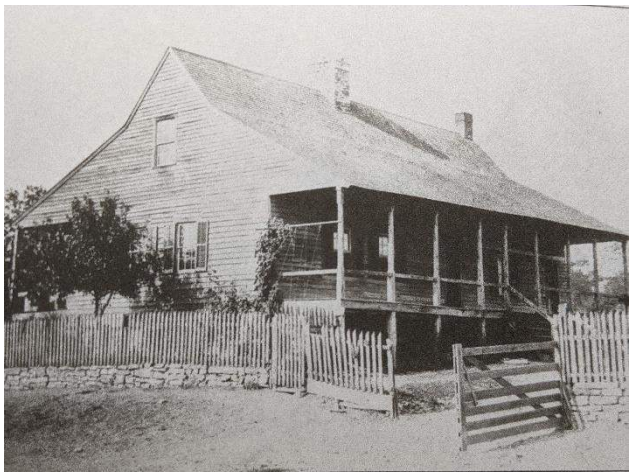
P50. Warped and loose siding boards on the north elevation.

[14] Engine House No. 1, Inc., "Historic Renovation of Bauvais-Amoureux House," architectural drawings, Ste. Geneviève, Missouri, January 12, 2007.

[15] Charles E. Peterson, "Early Ste. Genevieve and Its Architecture," *The Missouri Historical Review* XXXV, No. 2 (1941): 207-232; Henry Marie Brackenridge, *Recollections of Persons and Places in the West* (Philadelphia, PA: James Kay, Jun. & Co., 1834), 24.

[16] Richard Deposki. *Ste. Geneviève (Images of America)* (Charleston, SC: Arcadia, 2008), 29 and 32.

P51. C. 1916 photograph of the Vital St. Gemme Beauvais House, in the collection of the Missouri History Museum (https://mohistory.org/collections/item/N38680).



P52. C. 1900 photograph of the Beauvais-Amoureux House, from *Ste. Genevieve (Images of America), p.* 24. Note the central chimney is still stone.

P53. C. 1916 photograph of the Beauvais-Amoureux House, in the collection of the Missouri History Museum (https://mohistory.org/collections/item/N38681), Note the central chimney is now brick.

conclude that along with the structural alternations made by the Amoureux family starting in c. 1852 that the east and west end walls were covered with lap siding at the same time. In the earliest photographs of the Beauvais-Amoureux House (Photographs P52 and P53), the north wall also has weatherboard siding; however, the south wall appears to have always been plastered. In review of the available historical photographs, the wood lap siding appears to have an exposed face of somewhat less than 5 inches, perhaps closer to a 4.5-inch exposure.

### *Cedar Shake Roofing*

Description of Existing Construction

The existing cedar shake roofing was installed in 2007 by the Missouri DNR to replace a previous metal roof (Photograph P54).[17] The existing shakes are 18 inches long by widths ranging from 3 to 8 inches with an approximately 5-inch exposure (Photograph P55). The shakes are installed with triple head lap over open (or skip) sheathing over pole rafters and secured in place with concealed nails. Underlayment (roofing felt) appears to have been interlaced between courses but is not continuous under the shakes. The 2007 roofing replacement drawings indicate that lead sheet flashing was to have been installed at the ridge and the change in roof pitch. A half-round galvanized steel gutter is present at the eave of the south galerie (Photograph P56), but no gutter is present on the north eave. The tails of the galerie rafters are exposed along the north and south eaves. Lead sheet flashing is present at the stone chimney, which was partially reconstructed as part of the 2007 roofing replacement. The ridge is capped or "Boston" style[18] with horizontal, lapped shakes.

[17] Engine House No. 1., "Historic Renovation"

[18] Sharon A. Park, "Preservation Brief 19: The Repair and Replacement of Historic Wooden Shingle Roofs," *The Preservation of Historic Architecture* (Guilford, CT: The Lyons Press), 191-202. [Note: This version of Preservation Brief 19 differs from the one currently published on www.nps.gov.]

P54. Existing cedar shake roof on the south-facing roof slopes, showing shake coursing, chimney flashing, and capped ridge detail.

P55. Loose shake found on ground, showing extreme erosion of the exposed face.

Condition Assessment

The cedar shakes are in "fair" to "poor" condition, meaning that while they are generally performing as intended in most areas, localized areas of heavily deteriorated shakes are present, and the roofing has little remaining service life.

NPS has reported water intrusion through the roofing, particularly along the north eave. Evidence of water staining from small leaks through the shakes was observed in numerous locations in the attic, and pinpoints of daylight could be seen through the underside of the roof. The shakes were weathered, deteriorated, and heavily eroded; on the north slopes, algae and moss growth was prevalent due to shading by the adjacent cedar trees. Shakes and sheathing boards at both eaves were deteriorated (Photograph P57), as were multiple rafter tails (Photograph P58). Evidence of animal damage was also observed at the edges of shakes (Photograph P59).

Most of the open sheathing appeared to be original to the c. 1852 construction of the galeries or possibly early replacement boards, with only limited boards appearing to be modern replacements (Photographs P60 and P61). The sheathing boards were a mix of vertically and circular sawn nominal 1-inch by 6 to 8-inch boards, with space between boards of generally 3 to 4 inches (and larger in some locations). In localized areas, the sheathing boards were deteriorated due to water; water staining patterns on the sheathing boards suggest that significant water intrusion has occurred in the past.

Multiple generations of nails penetrated the open sheathing, representing a long history of roofing replacements. No hand-wrought or early cut nails with the characteristic hooked heads were observed. The blunt-tipped, stamp-headed, rectangular-shaft cut nails in place likely dated to the mid-1800s and later, with at least two, perhaps three, generations of cut nails, in lengths of 2 or 2.5 inches.[19] Cut nail spacing appeared to be fairly regular, and nails of comparable shaft diameter and length could in some areas be paired; measurements of paired nails suggest that the earlier shakes were approximately 5 to 6 inches wide. Several types of wire nails were also observed, of varying length and shaft diameter. Wire nails were available as early as the 1880s and generally supplanted the use of cut nails in the United States by around 1900.[20] Since wire nails have a 100-year history of use with little change in production technology, visually dating wire nails is difficult. It was also more difficult to interpret potential shake width using wire nail spacing due to the multiple

[19] Henry Mercer, "The Dating of Old Houses," *A Collection of Papers Read Before the Bucks County Historical Society,* V (1926): 536-549.

[20] Peter Priess, "Wire Nails in North America," *Bulletin of the Association for Preservation Technology* 5, no. 4 (1973): 87-92.

Photograph P56. Half-round galvanized gutter at the south eave, showing corrosion of the gutter and decay and biological growth on the shakes.

Photograph P57. Wet and deteriorated sheathing boards below eave overhang (looking up).

Photograph P58. Deteriorated rafter tails at south eave (looking up).

Photograph P59. Animal damage to edges of shakes.

P60. Open sheathing at south galerie roof, from the underside. The dark staining is evidence of exposure to water.

P61. Deteriorated and replacement open sheathing boards.

generations of wire nails in place; at a few locations where wire nails patterns could be determined, shake widths and lengths used after c. 1900 likely varied, similar to a modern overlap pattern.

Discussion

As originally constructed, c. 1792 by the Beauvais family, the House was likely a thatched, hipped roof.[21] Several locations of hand-riven *liteaux* (battens or stripping to which the thatch bundles were attached) are still fastened to the rafters with hand-wrought nails on the north and south (Photograph P62). There is much discussion if the Beauvais-Amoureux House was originally constructed with galeries on one or more sides; the placement of the extant liteaux, wrought nails still in place where liteaux have been removed, and a pattern of regular nail holes on the outside surface of the primary rafters suggests that the roof was once thatched along the full length of the primary rafters and that the galeries are later alterations. During the 2020 physical investigation, no remnants of the thatching was found. During the c. 1852 alterations by the Amoureux family, the roof shape was modified from hip to broken-pitch gable. The original thatch roof would have been replaced likely with wood shakes, as thatching requires a steep roof with a continuous slope to remain watertight. The intersections of the original hips also likely featured a finial where the head of the king post projected through the roofing, similar to those seen at the Bequette-Ribault House and the Louis Bolduc House (Photograph P63) in their restored states. These finials are suspected to have been points for water leakage and were removed;[22] evidence of water damage to the top of Truss VI was observed, supporting this supposition.

Vernacular building practices coming south from the Quebec region introduced the use of Norman trusses and roof shakes of several wood types, including pine, oak, and cedar, with cedar being prized for its superior decay resistance.[23] French Creole vernacular building practices coming north from Louisiana contributed to the broken-pitch gable roof and the

P62. Thatching liteaux or straps, secured to the c. 1792 rafters with wrought nails.

P63. King post finial at the Louis Bolduc house, with a projecting comb ridge.

P64. C. 1900 photograph of the Bequette-Ribault House, in the file of digital resources for the Beauvais-Amoureux House provided by NPS.

[21] Peterson, "Early Ste. Genevieve," 207-232.
[22] Luer and Frances, *Vanishing French Heritage*, 86.
[23] Association for Preservation Technology, "Early Roofing Materials," *Bulletin of the Association for Preservation Technology* 2, no. 1/2 (1970): 18-88.

additions of the galeries, along with a shared tradition of wood shake roofs.[24]

Documentation of historic buildings in Ste. Geneviève, including drawings and photographs within HABS collections, historic photographs from other sources, and secondary sources, such as modern publications, were surveyed regarding wood shake roof practices in Ste. Geneviève in the nineteenth century. This research was conducted in an effort to identify appropriate detailing and treatment for a roofing replacement project.

- The early photograph of the Vital St. Gemme Beauvais House (Photograph P52) shows modest overlap of the shakes at the rakes, no eave gutter, and regular shake coursing, consistent exposures, and a traditional overlap pattern. The ridge detail is not fully clear in the photo, but it may be capped or board ridge. The House appears to be well-kept. The building immediately to the right (south) has since been demolished or significantly altered, but this photograph shows a half-round gutter with round downspout at the eave of the broken-pitched wood shake roof.

- The c. 1900 photograph of the Bequette-Ribault House (Photograph P64) shows a projecting comb ridge, modest overlap of the shakes at the rakes and eave, no eave gutter, and regular shake coursing, consistent exposures, and a traditional overlap pattern. In this photo, the House appears to be occupied but in need of exterior repairs; damaged ridge combs and loose siding boards are visible.

- *Ste. Geneviève (Images of America)* includes a photograph of the Beauvais-Amoureux House, supposedly taken in 1937 but more likely dating to c. 1900, showing the House from the northeast, in good repair with a wood shake roof, picket fence on a stone wall, and a swinging gate on the north drive (Photograph P52). The shakes have regular coursing, consistent exposures, and a traditional overlap pattern. There is no gutter. The ridge does not appear to be a projecting comb. Because of weather patterns, the ridge comb would likely have projected from the north-facing slope and would be readily visible in this image. Here, the ridge appears to be a board ridge. The stone chimney is still in place, dating this photograph to no later than 1908.[25]

  A slightly later, possibly c. 1916 photograph shows the chimney has been replaced with brick and the shake roof repaired (Photograph P53).

  The earliest HABS photographs of the Beauvais-Amoureux House are dated 1936 or 1937 and show the House to be in disrepair with a corrugated metal roof, no picket fence or gate, and a partially collapsed stone wall. Telephone poles and wires are also visible in the earliest HABS photos.

  Based on twentieth-century documentation reviewed, the roofing on the House remained corrugated metal through the twentieth century until replaced with wood shakes by the Missouri DNR in 2007. The *Ste. Geneviève (Images of America)* photography likely dates well before 1937. The picket fence along the road is very similar to that in the c. 1900 Bequette-Ribault House photograph, but the image lacks other identifying features to help narrow the date.

- An unindexed photograph of an ancillary structure behind the Beauvais-Amoureux House dated 1936 is included in the HABS photographs (Photograph P65) (the Janis-Ziegler House/Green-Tree Tavern is visible in the background). The structure is in very poor condition with a heavily deteriorated and poorly

[24] Jay D. Edwards, "Creole Architecture: A Comparative Analysis of Upper and Lower Louisiana and Saint Domingue," *International Journal of Historical Archaeology* (2006): 27.

[25] A similar photograph showing the stone chimney was published in Louis Houck's *A History of Missouri: From the Earliest Explorations and Settlements Until the Admission of the State into the Union, Volume 1* (Chicago, IL: R. R. Donnelley & Sons Company, 1908), p. 358.

P65. 1936 HABS photograph of an ancillary structure on the grounds of the Beauvais-Amoureux House, showing an old and deteriorated wood shake roof.

repaired wood-shake roof. The shakes appear to have triple head lap, and the ridge is a board ridge. This structure is no longer extant.

- In a partial survey performed in December 2020 of vertical log structures in downtown Ste. Geneviève with wood shake roofs, none used a board ridge. Projecting comb ridges are commonly used; currently, the Janis-Ziegler House/Green-Tree Tavern, Bequette-Ribault House, Louis Bolduc House, and Guibourd-Vallé House, among others, feature projecting comb ridges as part of their historic interpretation. Other properties, including the Felix Vallé House, Vital St. Gemme Beauvais House, and Antoine Oneille House, feature a capped or "Boston"-style ridge.

***Galerie Structures***

Physical Description

The south galerie is the primary entrance. The galerie is an open-framed wood galerie at the same elevation as the first floor. The steps to the galerie are roughly centered on the south elevation, aligned with the entry to the center hall. Currently, there are ten wood posts, approximately equally spaced along the south elevation, and the galerie is enclosed with a single rail set at approximately 30 inches above the decking. The galerie joists are nominal 2x10 lumber, spaced at 24 inches on-center; the joists are pocketed into the vertical log wall with a cement-based grout and appear to be reclaimed members from another

P66. Mortise and tenon connections at the c. 1963south galerie railings.

structure. At the west end of the galerie, the framing has settled by about 12 inches; per NPS, this settlement is related to the recent collapse of a well just south of the west end of the galerie. Post and rails are connected with mortise and wood pins (Photograph P66), and the posts chamfered. Several of the beams and part of the perimeter beam at the south galerie are replacement members. The wood decking is nominal 1x boards of various width, secured to the joists with modern wire nails or reproduction "cut" nails. At the west end of the south galerie, a steep flight of 13 stairs leads to the grenier.

The Donze family enclosed the north galerie with a frame wall and wood siding sometime prior to the 1986 HABS photographs (Photograph P67). There is visibility of the framing is limited to the lower part of the posts, the joists, and the underside of the decking. The north galerie has similar framing as the south and is constructed of a combination of vertically and circular sawn lumber. The decking boards are a mix of hewn, vertically sawn, and circular sawn boards.

Condition Assessment

The existing framing at the south galerie is aged but generally in “good” condition, meaning it is performing as intended. Localized deterioration of wood was observed at a few joist ends and a few locations where the rail board is mortised into the post. The decking was generally in serviceable condition, and no areas of deteriorated wood, loose boards, or tripping hazards were observed.

P67. 1986 HABS photograph from the northeast, showing the north galerie enclosed.

P68. Deteriorated post end at north galerie.

At the north galerie, the bearing ends of several posts where in contact with soil were heavily deteriorated (Photograph P68).

The grenier staircase is in "poor" condition, meaning that it has limited serviceability and needs repair (Photograph P69). Several treads are deteriorated or loose, and the stair structure is not well supported and, despite shoring at the back, is easily displaced at the base, making the stairs somewhat hazardous.

P69. Deterioration of the grenier stairs.

Discussion

Both the north and the south galeries have been heavily altered, if not completely reconstructed, with at least two major periods of alteration. In the *Ste. Geneviève (Images of America)* photograph, the north galerie is shown with nine posts, vertically continuous from edge beam to grade and decoratively chamfered. The 1937 HABS photographs, in which the House is in disrepair, show the south galerie as also having nine posts; three of the posts are not vertically continuous, only one post appears to be chamfered, and the other posts area a mix of roughly shaped poles and hewn lumber. The south galerie stairs are not centered, and the railing is missing. Where visible in the 1937 HABS photographs, the north galerie posts are the chamfered posts visible in the c. 1900 and c. 1916 images.

The 1986 HABS photographs appear to represent the existing conditions, indicating that the galeries were altered or reconstructed during the Donze family ownership. Currently, ten posts are present at both the north and south galeries; at the south, these posts have a decorative chamfer, but not as prominent as the chamfer seen in the historic imagery. The stairs have been centered on the south galerie and a railing has been installed. Since these 1986 images, a few of the framing members and the stairs have been replaced, but other members appear to date to at least 1986.

None of the fabric at the south galerie appears to be original, but the presence of several hewn decking boards at the north galerie suggest that some of the early decking may have been reused. The vertical posts, edge beams, and joists at both galeries appear to be replacement members. Evidence of notching and abandoned anchor holes indicate that the lumber used by the Donzes to rebuild the two galeries was reclaimed wood from another structure. The archaeological study conducted in 1996 did identify

buried limestone foundations roughly in line with the current galerie posts along both the north and south elevations, suggesting that while the galeries have been altered and rebuilt, they are roughly the same size as originally constructed.

The grenier stairs do appear to be the same stairs visible in the 1937 HABS photographs. The knots, holes, and wood grain visible on the stringer and risers align with the boards still extant. Several of the treads appear to be replacements, but many may date before 1937.

## TREATMENT RECOMMENDATIONS

The vertical logs that make up the poteaux-en-terre construction and the Norman-style roof framing, including the king-post trusses and rafters, have high integrity, are character-defining features, and should be preserved. The long-term preservation challenges for wooden buildings are significant and well-recognized among heritage professionals.[26] However, with proper care, maintenance, and key structural interventions, the life of the House can be extended for the enjoyment of future generations.

Schematic budget costs to address treatment recommendations below are attached as Appendix A.

### *Vertical Log Walls*

The exterior walls are stable for the moment but need continual monitoring to extend the life of this component of the House. Ultimately, structural intervention will become necessary, but the adoption of a conservation approach may be preferable at present. Although the logs are compromised below grade, and some are hollow above grade, they are independent of the support system for the first-floor structure. Additionally, the wall top plates distribute the load of the roof trusses and rafter across the log walls so that they are not directly bearing upon specific logs. Therefore, the presence of the wall top plate reduces the effects of section loss or deterioration within individual logs. With this understanding, stabilization or restoration efforts related to the exterior walls must avoid preferentially loading any individual log.

<u>Monitoring</u>

- A benchmark with dated markings for a level survey has been installed in the caveau so that future relative movements can be monitored. We recommend subsequent surveys be performed annually until foundation stabilization can be performed.
- A plan survey can be performed to measure the relative horizontal movement of the north and south wall top plates; this measurement will be an early warning sign of movement related to distress of the roof framing, and the readings from the 2020 survey can serve as a benchmark to determine if movement or displacement occurs in the future.
- It was also observed that the moisture content of wood structural members is typically higher in the caveau than elsewhere in the House. In addition to the levelness survey already in place, we recommend the installation of data loggers in the caveau, first floor, attic, and outside the structure that will collect air temperature, relative humidity, and dewpoint measurements on a cyclical basis to study and better understand the microclimates within the structure, especially in the caveau.

<u>Long-Term Stabilization</u>

Treatment of the exterior vertical logs to address long-term stabilization of the House will likely require highly invasive measures. Options to consider may include replacement of foundation logs to the first floor, permanent shoring of the existing logs with underpinning, or construction of a modern, concealed foundation. This treatment has the potential to negatively impact arguably the most important character-defining feature (the poteaux-en-

[26] Marikh Laht, "Environmental Problems in Preserving Wooden Buildings at the Estonian Open Air Museum," *ASTM STP 1351 – Wood Structures: A Global Forum on the Treatment, Conservation and Repair of Cultural Heritage*, Kelley, S., Loferski, J., Salenikovich, A., and Stern, E., ASTM: Philadelphia (2000), 105.

terre construction, of which the Beauvais-Amoureux House is one of only five remaining), raises complex questions regarding integrity, potentially affects interpretation and visitor experience, and impacts park maintenance and operating costs. We recommend that monitoring be performed in the interim and formal treatment recommendations be developed as part of the broader site treatment and interpretation discussions within the HSR currently under development. Alignment with other park governing documents, those both currently in process and those not yet developed, is important.

***Exterior Grading and Surface Runoff***

Although a sump pit with ejector pump is present within the caveau to remove bulk water, the vertical logs exhibit interior moisture content levels, which will promote fungal decay. The soil adjacent to the south wall and within the caveau along the south wall was moist. Low spots, pits, and holes dug by animals were observed under both the north and south galeries.

To potentially reduce the moisture within the vertical logs and the caveau, exterior regrading should be performed to promote positive drainage away from the exterior walls. To reestablish a positive surface slope, the grade should be increased approximately 12 inches over 6 feet along the north and south elevations, with deeper fill as required to level low spots and animal burrows. New soil should be clean fill with a similar ratio of clay/sand-to-organic material as the soil at the site and compacted in layers by hand. Regrading work will require little to no disturbance of subsurface conditions, but an archaeological survey should be performed in advance of the work in compliance with NPS requirements.

Additionally, the buried downspout extension along the west elevation is broken and is discharging water at the low spot on the northwest corner. The downspout should be disconnected from the damaged line and can be extended above grade along the west elevation to discharge water away from the exterior walls and visitor walking paths.

***First-Floor Structure***

The first-floor structure with the 1990s-installed shoring remains intact in a partially failed condition. For present usage, the floor framing is safe as shored for small groups. We recommend that unrestricted access to the House not be allowed until repairs can be performed. We do not recommend that permanent furnishings or exhibits be moved into the House until further repair or stabilization is performed.

Long-Term Stabilization

Similar to the treatment of the vertical log walls, treatment of the first-floor structure to address long-term stabilization of the House may require invasive measures, particularly if there is a desire to remove the shoring for interpretative purposes. This may require replacement of many of the floor framing members. Because the floor framing is independent of the exterior walls, this work could be done separately, but because of logistical challenges and spatial constraints, it may be more logical and cost-effective to perform work on these two systems concurrently. The same considerations for historic fabric, impact to park operations, and impact to visitors as discussed with the exterior walls would apply to treatment recommendations for the floor framing. Because the floor framing is currently stable, we recommend that formal treatment recommendations be developed as part of the HSR.

***Roof Framing***

The roof framing is distressed because of the damage of several of the truss connections. However, the roof trusses are character-defining features that are highly significant and other than localized distress, the trusses are in good condition. Every effort should be made for their preservation.

Roof Framing and Attic Repairs

- The localized damage at the apex of Truss VI can also be stabilized with steel brackets and rods or could be repaired by partial removal and replacement of the king post and the top portion of the southern top chord. With either approach, the trusses should be stabilized against further spreading and adequate to resist code-mandated loads to the roof structure. With stabilization of

the truss connections, the rafters will be returned to their original structural intention and will not require strengthening, other than minor repairs to assure that the ridge and wall top plate connections can transfer the anticipated loads.
- The damaged and missing members of the ridge brace trusses should be reinforced or replaced in kind.
- The floorboards in the attic are unsafe and should be replaced or reset as required to provide a safe walking surface.

Approach A – Truss Stabilization

The following is an approach for strengthening and stabilizing the roof structure while either preserving or restoring the existing roof trusses. Both Approach A and B, as described below, would require extensive structural studies of the existing Norman trusses, roof rafters, and their sharing of the roof loads.

- To stabilize the truss connections, add a horizontal metal tie rod above the first-floor ceiling beam with a metal shoe at the truss top chord-to-ceiling beam connection. The metal tie rods can be located within the attic space to minimize impact to interpretation and visitor experience.
- To preserve the historic beams in place, the termite-related section loss at the bearing will need to be addressed. Several options exist for the treatment of this failed connection:
    - Stabilization of the existing beams with metal shoes and tie rods can be performed. These interventions will likely be visible from the first floor and may impact interpretation and visitor experience.
    - For concealed repairs, horizontal metal rod reinforcement with epoxy adhesive can be used to fill the void spaces created by the termite damage and provide some supplementary strength to the end of the member. Since there is little data on repairs of this nature, the expected life span and adequacy of the repair are unknown.
    - Partial or full replacement of the walnut ceiling beams can be performed. This option represents a significant loss of historic fabric and will require careful analysis and shoring of the roof framing.

If the trusses and ceiling beams are restored to their original structural intent, the exterior wall top plates should not continue to displace. Therefore, adding additional visible tie rods within the first-floor space may not be required. If only the trusses and beams are repaired, monitoring of the relative horizontal movement of the top plate should be performed regularly to check the performance of the truss tie rod repairs.

Approach B: Reinforcing Rafters to Share Truss Loads

If the trusses and ceiling beams cannot be adequately repaired, the roof rafters will be required to resist some of the roof loads in a way they were not originally intended, and therefore the likelihood of continued splaying of the wall top plates will continue. The top plates would need to be tied together, requiring steel rods to be installed across the width of the House. The rods would need to be placed at the center of the top plate, which would require the rods to be exposed within the first-floor living space and visible to visitors. In this scenario, the rafters would also need to be mechanically fastened to the wall top plate connection, as the historic connection detail may not be sufficient to resist the increased loads being applied to the rafters.

***Siding***

The existing cedar lap or weatherboard siding is nearing the end of its useful service life and should be replaced. The cedar siding and trim boards are not historic and can be replaced with modern materials to replicate the appearance of the House in historic photography. Siding replacement should be considered within 3 to 5 years.

- Premium grade cedar siding should be used. This will provide a prolonged service life since the siding will not be painted. Consideration should be made to whether an oil or limewash treatment to non-pressure treated cedar siding may be more historically appropriate, though it would increase cyclical maintenance requirements.
- Board exposure should fall within 4.5 to 5 inches, and exposed siding nails can be aligned with framing members and historic placement.

- The felt underlayment and flashings at window and door heads should be replaced.
- Window restoration or replacement, although outside the scope of this assessment, should be considered at the same time.

### *Roofing*

The existing cedar shake roofing is at the end of its useful service life and should be replaced. Maintaining a watertight roof is critical to the protection of the original roof structure, and per park staff, repairs to the roofing system have not resolved ongoing water intrusion issues. The cedar shakes, flashing, and other roofing accessories are not historic and can be replaced with modern materials sensitive to the existing construction and appropriate for a wide range of potential periods of significance, to be determined by the HSR. Roof replacement should be performed as soon as park operations and budgets allow.

The following recommendations are made for a replacement roofing system:

- Tapersawn, premium-grade cedar shakes will provide excellent service life and a historically appropriate appearance (Figure 11). Based on historic documents and a general understanding of wood shake manufacture in the mid-1800s, a rustic or rough-split shake would likely not represent a historically appropriate appearance. The smooth finish of a tapersawn shake will provide the appearance of a shingle with the superior performance of a shake.
- Shakes of approximately 5-inch widths and triple head-lap, set in regular coursing with traditional overlap pattern, also appear to align with physical evidence observed at the House of mid-1800s roofing and the limited historic photographic evidence for local practices that has been reviewed.
- Interleaving of asphalt-impregnated roofing felt between shake courses is a fairly modern treatment but should be considered for improved water shedding of the shakes. A continuous underlayment is not recommended to allow the shakes to "breathe" and dry to the interior, but a layer of ventilated mesh (sometimes called “cedar breather”) between the shakes and the open

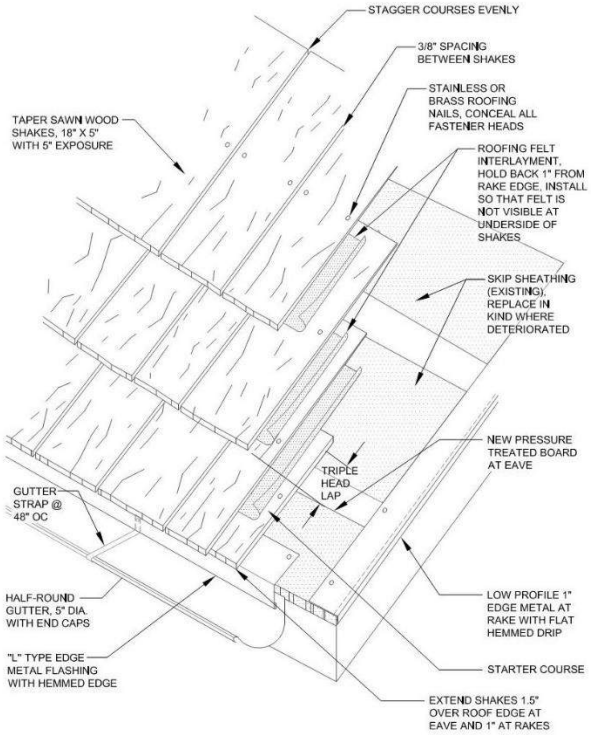



Figure 11. Conceptual eave and rake detail.

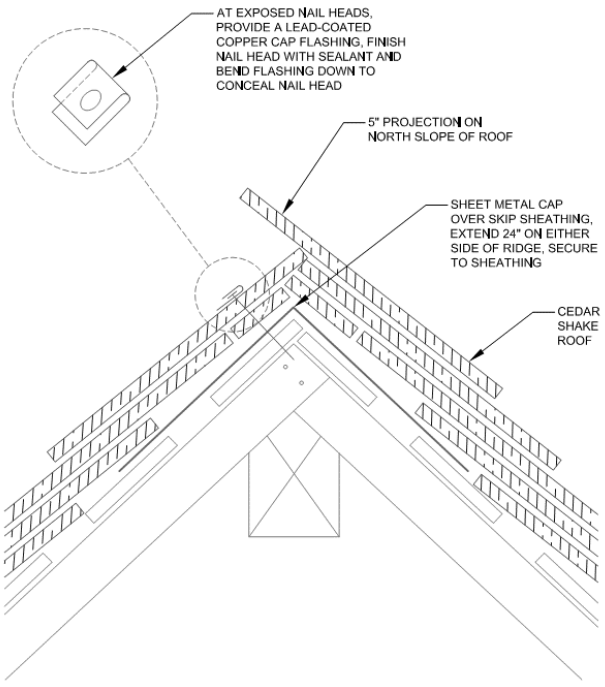



Figure 12. Conceptual ridge detail with projecting comb.

sheathing boards will promote drying and extend the service life of the shakes. Care should be taken during installation so that the interlayment felt is not visible from the interior.

- A historically appropriate ridge cap may depend on the period of significance (Figure 12 or 13). A projecting ridge comb has support as a local practice both historically and in modern restorations. Further research might indicate if a board ridge would a more appropriate treatment (Figure 13). Either way, the capped or Boston-style ridge currently in place is anachronistic for this region.
    - Attic ventilation should also be considered during the roofing replacement design. If required, the ridge cap can incorporate a low-profile or concealed open vent to promote air circulation within the attic.

- Concealed sheet metal flashings at the eaves and rakes (Figure 11), ridge (Figure 12), and the change in slope (Figure 14), should be considered. With open sheathing, these conditions are sensitive to leakage. At eaves and rakes, low profile edge metals, although not historically appropriate, are recommended for better water resistance at these conditions.
    - For fully concealed sheet metal, stainless steel or copper are recommended with a cedar shake roof for durability.
    - Where sheet metal is visible, a matte gray appearance would likely be the most historically appropriate. Lead mining in this region of Missouri dates back to the eighteenth century, and lead would likely be the flashing material used during much of the House's early history. For durability, lead-coated copper would be recommended over pure lead sheets. Lead and lead-coated copper should not be used for downspouts or where visitors are able to touch the sheet metal.
    - In lieu of lead or lead-coated copper, sheet copper with a tin-zinc coating is also available. Marketed as "Freedom Gray" or TCS-II with a satin finish, this product provides the matte gray finish of lead without the environmental and worker-safety considerations. Natural tannins and acids that leach from cedar shakes may affect the finish of a tin-zinc coating, and consultation with the manufacturer is recommended.
    - Copper has a long history of use for roofing and is chemically compatible with cedar. The service life of copper or a coated copper sheet

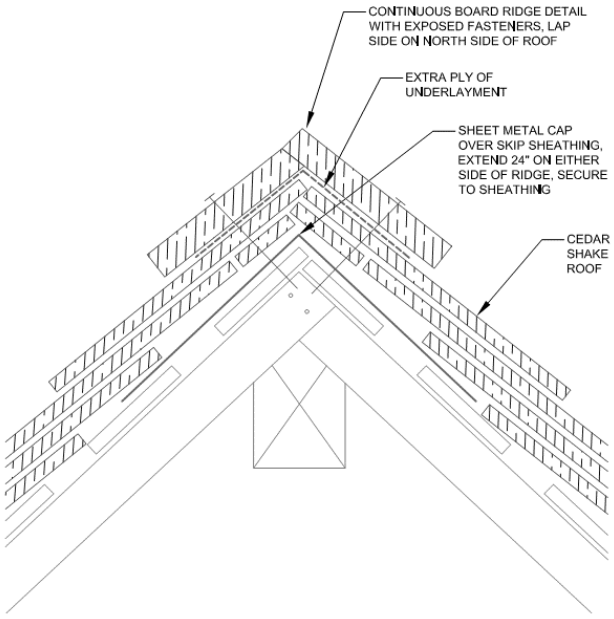



Figure 13. Conceptual ridge detail with board ridge.

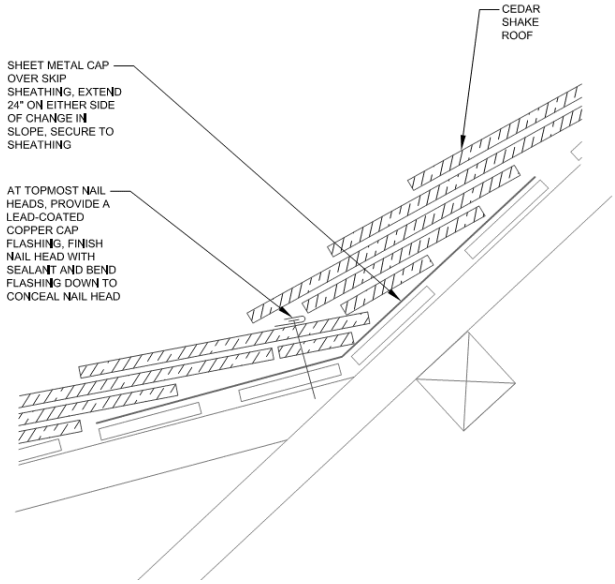



Figure 14. Conceptual detail at break in slope.

would match or exceed that of the shake roofing. For downspouts and gutters, copper theft is a factor to consider.

- Galvanized steel sheet, both painted and unpainted, was widely available for roofing use by the middle of the nineteenth century. Galvanized gutters and downspouts would be appropriate pending determination of the period of significance; however, when in contact with cedar, the service life of galvanized sheet metal is reduced and may not match the service life of other components of the roofing system.

For these reasons, we recommend that lead-coated copper, tin-zinc-coated copper, or uncoated copper be considered for visible metal flashings.

- Localized replacement of the skip sheathing in kind will be required.
- Localized replacement of deteriorated rafter tails can also be performed in tandem with roofing replacement.
- Gutters are recommended at the north and south eaves. Historic photographs showing half-round gutters and round downspouts indicate that they were a regional practice at the end of the nineteenth century. Documentation of the House does not support a gutter on the north eave; however, control of water shedding from the roof and eave flashing will reduce the opportunity for water intrusion at the roof edge.

  Gutters and downspouts should be of a similar metal to that selected for the roof flashing.

  - If lead-coated copper is selected for roof flashings, the downspouts should be of a metal of a similar matte gray appearance but should be lead-free. Galvanized steel sheet would be an alternative to consider because downspouts are easily replaced if damaged.
  - If uncoated copper is selected for roof flashings, a prefinished steel or aluminum sheet in a color to resemble patinated copper might be considered to deter copper theft.

# Appendix D - Historic Photographs

Figure AE-1 A c. 1900 view, looking slightly southeast, likely the earliest photograph of the house known to date. The west end has already been altered, but the central chimney is still stone. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file; reproduced in Houck's *A History of Missouri*, Vol 1, p. 358)

Figure AE-2. c. 1900, looking southwest. (Source: *Ste. Genevieve: Images of America*, source of the original photograph is currently undetermined)

Figure AE-3. c. 1910, looking southwest from St. Marys Road. Note the central chimney is now brick and the wood shingle roof has been repaired. The house has been painted, the retaining wall and fences repaired, and new lattice skirting added to the north gallery. (Source: Missouri State Historical Society, N38681)

Figure AE-4. 1936, looking northwest from St. Marys Road. Note the poor condition of the attic window. The south wall stucco appears to have been recently repaired but not yet painted. (Source: HABS).

Figure AE-5. c. 1937, looking northwest from St. Marys Road. A replacement sash and some glazing repairs have been performed at the attic window, and the south wall stucco has been painted. This may be a Piaget/van Ravensway photograph that was not included in the HABS collection. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file)

Figure AE-6. c. 1937, floor framing as viewed from within the caveau, looking east with the central chimney at left. This may be a Piaget/van Ravensway photograph that was not included in the HABS collection. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file)

Figure AE-7. c. 1937, exterior log wall and floor beam, viewed from within the caveau, possibly looking south. This may be a Piaget/van Ravensway photograph that was not included in the HABS collection. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file, reproduced in Pteterson, “Early Ste. Genevieve,” p. 222)

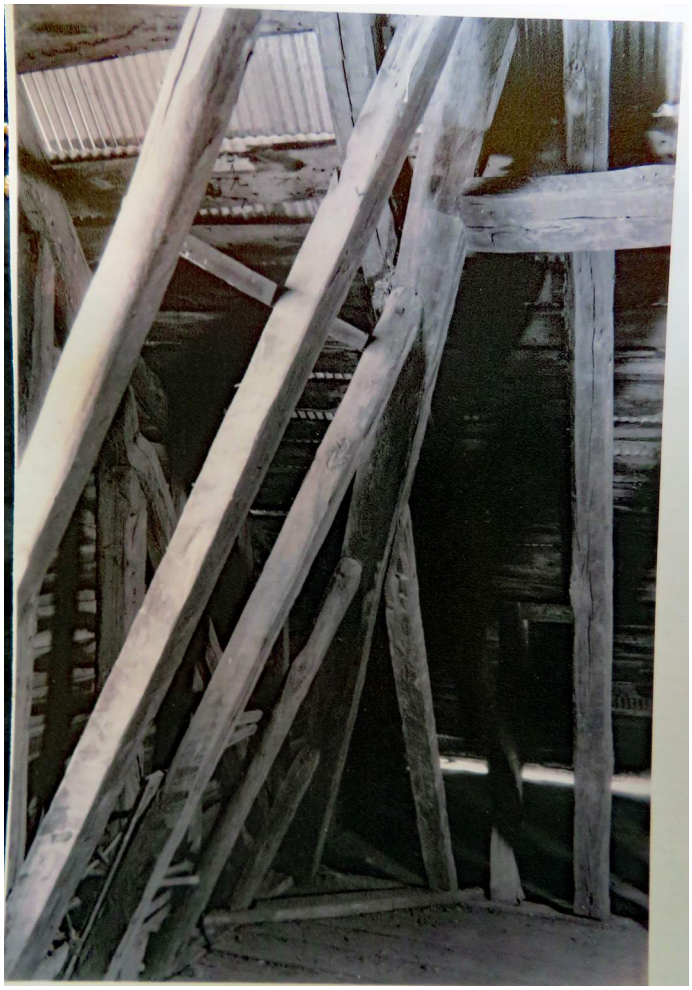


Figure AE-8. c. 1937, c. 1937, southeast corner of the roof hip framing, viewed from within the grenier. This may be a Piaget/van Ravensway photograph that was not included in the HABS collection. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file.)

Figure AE-9. c. 1937, looking west from St. Marys Road. (Source: HABS)

Figure AE-10. c. 1937, looking northwest from St. Marys Road. (Source: HABS)

Figure AE-11 c. 1937, looking northeast at west and south walls. (Source: HABS)

Figure AE-12. c. 1940, looking northeast at west and south walls.. (Source: HABS)

Figure AE-8. c. 1940, stairs to the grenier. (Source: HABS.)

Figure AE-14. c. 1940, Norman truss roof framing and stone masonry chimney, looking west. Note the brick masonry chimney in the background and the displacement of the attic floor.. (Source: HABS)

Figure AE-15 c. 1949, looking northeast at west and south walls before the 1960s restoration. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file.)

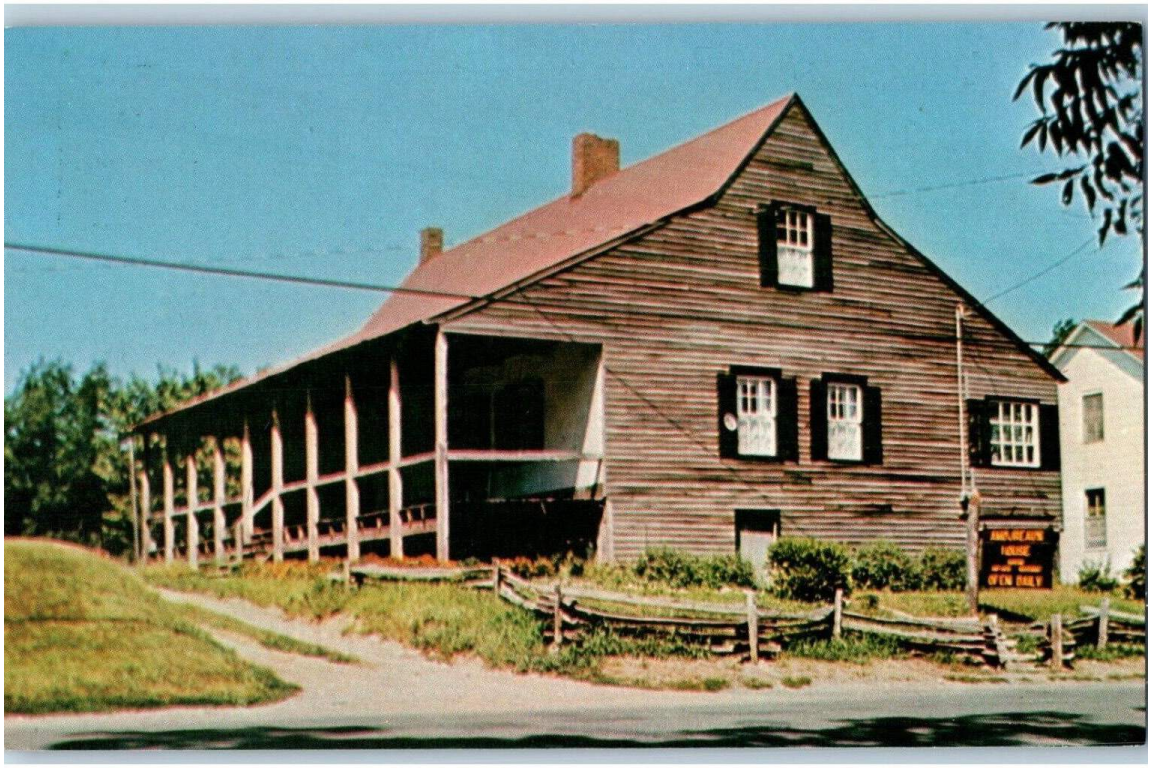


Figure AE-16. c. 1965, looking northwest from St. Marys Road, shortly after the 1960s restoration.. (Source: Dunkers Studio, Postcard No. 751232, undated)

Figure AE-17 c. 1970, looking northwest from St Marys Road. (Source: Johnson, "Missouri French Houses," p. 4)

Figure AE-18. 1986, looking northwest. Note the gift shop structure in the background. (Source: HABS)

Figure AE-19  1986, looking northeast.  (Source: HABS)

Figure AE-20.  1986, looking north.  (Source: HABS)

Figure AE-21 1986, looking southwest at the enclosed north gallery. (Source: HABS)

Figure AE-22. 1986, looking south at the exposed vertical logs on the north wall under the gallery deck. (Source: HABS)

Figure AE-27 1986, exposed vertical logs and stone masonry piers supporting the floor framing, visible in the caveau. (Source: HABS)

Figure AE-28. 1986, Floor framing and vertical logs in the caveau, looking southeast. Note the limestone foundation and dimension lumber sill at left; the logs on this wall were modified to bear on a stone foundation. (Source: HABS)

Figure AE-29 1986, roof framing looking west. Note the brick masonry chimney in the background. (Source: HABS)

Figure AE-30. 1986, close up of the Norman truss roof framing. (Source: HABS)

Figure AE-31. 1986, northeast corner of the roof hip framing, viewed from within the grenier. Note the liteaux visible in the center of the photograph. (Source: HABS)

Figure AE-32. c. 1990, looking northwest at the south wall. (Source: Donze Family collection)

Figure AE-33 c. 1990, looking west from St. Marys Road. (Source: Donze Family collection)

Figure AE-34. c. 1990, looking southeast at enclosed north gallery. (Source: Donze Family collection)

Figure AE-35 c. 1990, looking northeast at giftshop (no longer extant). (Source: Donze Family collection)

Figure AE-36. c. 1990, looking southeast at giftshop (no longer extant). (Source: Donze Family collection)

Figure AE-37. c. 1990, Room D (100), interpreted as a kitchen and dining space, looking east towards the partition wall and door to the hall. (Source: Donze Family collection)

Figure AE-38. c. 1990, Room D (100), interpreted as a kitchen and dining space, looking west towards the west exterior wall. (Source: Donze Family collection)

Figure AE-39. c. 1990, Room A (103), interpreting as a sitting or living space, looking northeast from Door 102. Note the north gallery window at left infilled with shelves. (Source: Donze Family collection)

Figure AE-40. c. 1990, Room A (103), interpreting as a sitting or living space, looking northwest. Note the north gallery window sat right infilled with shelves. (Source: Donze Family collection)

Figure AE-41 c. 1990, Room C (104), interpreted as a bedroom, looking west from Door 104A. (Source: Donze Family collection)

Figure AE-42. c. 1990, Hall (101), looking north from Door 101. (Source: Donze Family collection)

Figure AE-43. c. 1990, looking southeast at the east wall (left) and south wall (right), a similar angle of view as AE-28. (Source: Donze Family collection)

Figure AE-44. 1993, aerial photograph taken during the Great Flood of 1993, showing the level of the floodwaters. (Source: Nager, *Ste. Genevieve: A Leisurely Stroll Through History*)

Figure AE-45. c. 2001, looking northwest from St. Marys Road. (Source: Ste. Genevieve National Register Historic District Nomination)

Figure AE-46. c. 2007, south facade, looking slightly northwest, before the 2007 siding and roofing replacement projects. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file)

Figure AE-47. c. 2007, grenier stairs, looking slightly northwest, before the 2007 siding and roofing replacement projects. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file)

Figure AE-48. c. 2007, south facade, looking northwest from across St. Marys Road, before the 2007 siding and roofing replacement projects. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file)

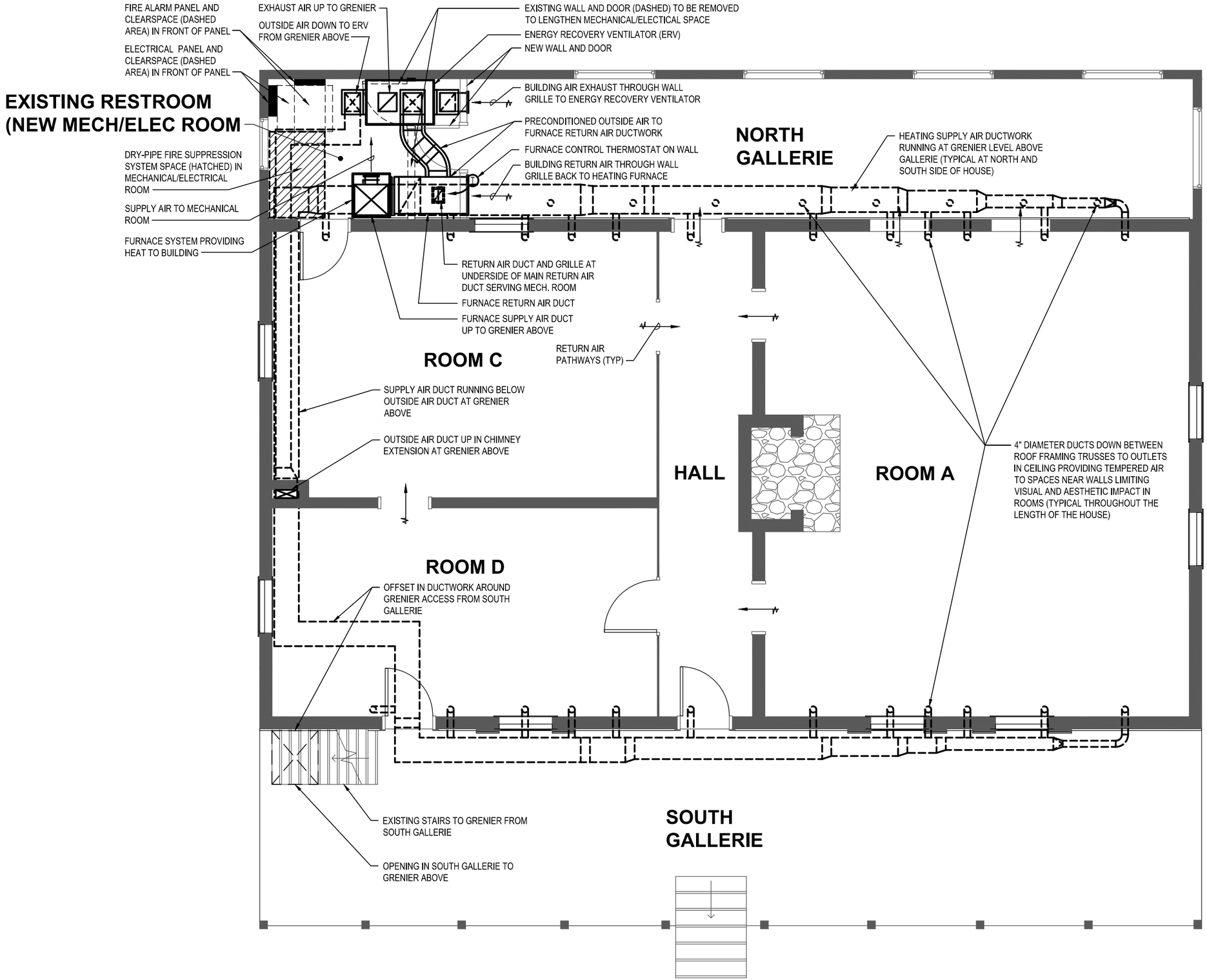
Figure AE-49. c. 2007, east and north exterior walls, looking southwest from across St. Marys Road, before the 2007 siding and roofing replacement projects. (Source: MoDNR Felix Vallé House State Historic Site, Beauvais-Amoureux House vertical file)

Figure AE-50. May 2007, south exterior wall from the caveau. Note the 1994 shoring. (Source: Andrew Balet, Wikimedia Commons, https://en.m.wikipedia.org/wiki/File:Poteaux-en-Terre-Cellar_of_the_Bauvais-Amoureux_House.jpg)

Figure AE-51. May 2007, south exterior wall from the caveau. Note the 1994 shoring. (Source: Andrew Balet, Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Photograph_Looking_West_of_the_Cellar_of_the_Amoureaux_House_in_Ste_Genevieve_MO.jpg)

Figure AE-52. May 2007, south exterior wall from the caveau. Note the 1994 shoring. (Source: Andrew Balet, Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Poteaux-en-Terre-Cellar_of_the_Bauvais-Amoureux_House.jpg)

# Appendix E - MEP Main Level Plan




# MAIN LEVEL FLOOR PLAN

NO SCALE

NPS BEAUVAIS-AMOUREAUX HOUSE
HISTORIC STRUCTURES REPORT

SKETCH MS-1

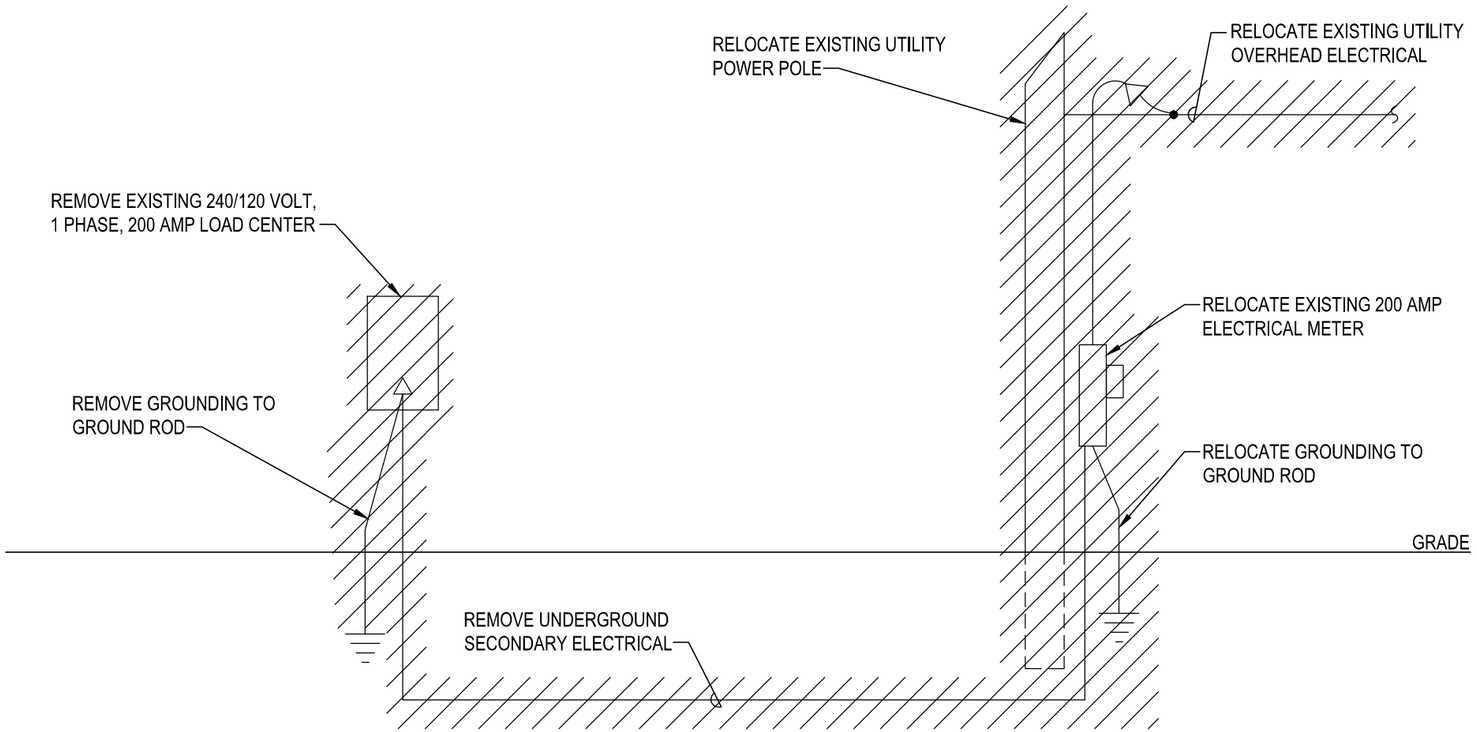
DRAWING REFERENCED:

DATE MAY 2021

PROJECT NO. 2020 8222

ALVINE Engineering

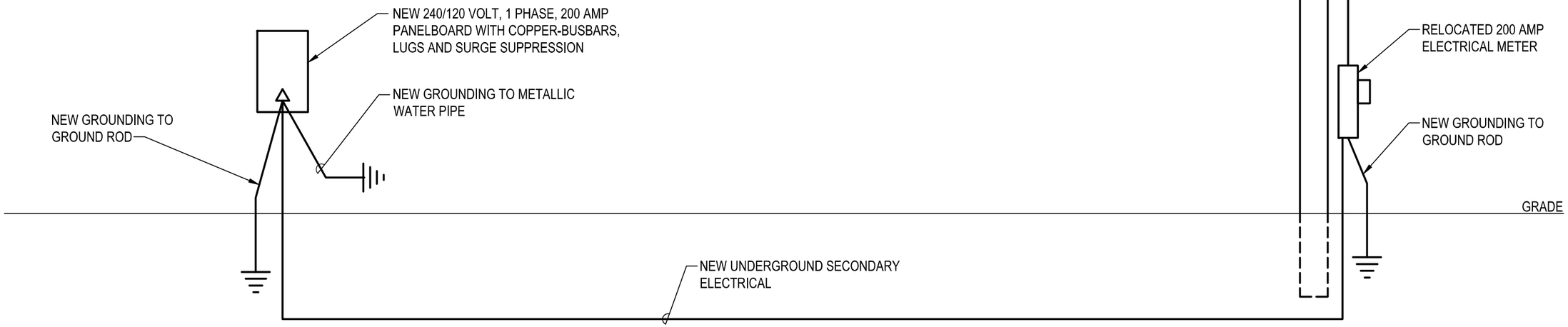
# Appendix F - Electrical Riser Plan




# ELECTRICAL RISER DIAGRAM - DEMOLITION

1 / ES-1

NO SCALE




# ELECTRICAL RISER DIAGRAM - NEW WORK

2 / ES-1

NO SCALE

NPS BEAUVAIS-AMOUREUX HOUSE MEPT HISTORIC STRUCTURES REPORT-
PHASE III - HISTORIC STRUCTURES REPORT

| DATE | SKETCH |
|---|---|
| MAY 14, 2021 | ES-1 |
| PROJECT NO. | - |
| 20208222 | |

ALVINE Engineering

# Appendix G - Phase 2 Environmental Survey Report

Consulting
Engineers and
Scientists

February 1, 2021
GEI Project 2004933

VIA EMAIL: lmblank@rrj.com

Lurita McIntosh Blank
Raths, Raths & Johnson, Inc.
500 Joliet Road
Suite 200
Willowbrook, IL 60527

Dear Ms. McIntosh Blank:

**Re: Environmental Survey of Lead-Based Paint, Asbestos, and Hazardous Materials**
**Beauvais-Amoureux House**
**Ste. Genevieve, Missouri**

GEI Consultants, Inc. is pleased to submit this report presenting the findings of the lead-based paint, asbestos, and hazardous materials survey performed at the Beauvais-Amoureux House located at 327 St. Mary's Road, St. Genevieve, Missouri on November 16 and 17, 2020. This work was completed in accordance with the Standard Agreement between Raths, Raths, & Johnson, Inc. and GEI dated October 09, 2020 and the RRJ, Inc. Task Order Number 140P6020F0146 dated October 5, 2020.

GEI subcontracted SITEX Environmental, Inc. of St. Louis Missouri to lead the field investigation activities at the Beauvais-Amoureux House. The investigation report prepared by SITEX is attached.

If you have any questions, please feel free to contact me at 618-830-4036.

Sincerely,

GEI CONSULTANTS, INC.

Nathan McNurlen
Project Manager

Attachments
Hazardous Materials Survey of Beauvais Amoureux House – SITEX Environmental, Inc.

c: Mr. Bob Acker – GEI Consultants
Mr. David Russian – GEI Consultants

SITEX Project No: 16276

# HAZARDOUS MATERIALS SURVEY

# Of

# Beauvais Amoureux House
# 327 Saint Mary's Road
# Sainte Genevieve, Missouri 63670

Prepared for:

GEI Consultants
400 North Lakeview Parkway, Suite 140
Vernon Hills, Illinois 60061

Prepared by:

SITEX Environmental, Inc.
1525 South Broadway
St. Louis, Missouri 63104

December 8, 2020

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# EXECUTIVE SUMMARY

SITEX Environmental, Inc. (SITEX) was awarded the contract by GEI Consultants, Inc. (GEI) to perform a hazardous materials survey of the Beauvais Amoureux House located at 327 Saint Mary Road in Sainte Genevieve, Missouri. This assessment was performed to determine the presence or absence of asbestos-containing materials (ACM) and lead-based paint (LBP) for the purposes of building renovation and demolition. Bulk samples of suspect building materials were analyzed for asbestos content by Polarized Light Microscopy (PLM). Paint on surfaces was tested for lead content using an X-Ray Fluorescence (XRF) spectrum analyzer. Additionally, SITEX took an inventory of universal hazardous materials including fluorescent light fixtures, ballast, and chemicals. The estimated quantities of these items are summarized at the end of this report.

# SURVEY INTRODUCTION/SCOPE OF WORK

This survey was conducted by Robert H. Hill II from November 16, 2020 and November 17, 2020. The 1790s French log/timber structure is a one-story log cabin residential structure with partial basement. The structure is part of the National Park Service (NPS). The exterior roof is pitched with cedar shake shingles. The interior ceilings consist of hardwood and/or painted plaster or drywall. Interior walls consisted of painted drywall, plaster and log/timber. Interior floors consisted of hardwood flooring.

# ASBESTOS SURVEY SUMMARY TABLE DEFINITIONS

**Sample Number**

A number is assigned to each sample to track results. A homogenous area is defined as an area of material that is uniform in color, texture and age. Each homogenous area was given a distinct letter designation. An example of the numbering sequence is as follows:

**BA-DW-D1**

BA = Beauvais Amoureux House
DW = Drywall Joint Compound System
D = Homogeneous area designation (4$^{th}$ identified homogeneous area)
1 = First sample taken of material description

**Sample Description**

Describes the bulk sample material collected.

**Approximate Quantity**

Approximate quantity of ACM broken down by location.

**Abbreviations**

AI = Attic Insulation
CH = Chinking
DG = Door Glazing
DW = Drywall Joint Compound System
MO = Mortar
MS = Black Mastic
PL = Plaster
ST = Stucco
WG = Window Glazing

**Condition**

Condition of the suspect material at the time of this inspection. This is based on the discretion of the inspector. The condition categories are as follows:

Good = no visible damage
Fair = minor damage
Poor = major damage, needs action as soon as possible

**Accessibility**

Indicates how accessible the suspect material is and to what group of people. The categories are as follows:

Low = material is inaccessible or access is very limited
Moderate = material is only accessible to maintenance personnel
High = material is accessible to the general public

**Friability (Non-Friable versus Friable)**

A designation to indicate friability (extent to which material, when dry, may be crushed, crumbled or reduced to powder with hand pressure):

**Friability (Non-Friable versus Friable) Continued**

No = non-friable
Yes = friable

**Bulk Sample Results**

Positive - > 1% Asbestos
Negative - < or = 1% Asbestos

The United States Environmental Protection Agency (U.S. EPA) guidelines for classifying asbestos containing material is any material that contains equal to or greater than one percent (1%) asbestos by visual estimated weight percent (% weight).

# ASBESTOS SURVEY SUMMARY

SITEX collected up to three bulk samples of each homogeneous suspect asbestos continuing building materials (ACBM) which was observed throughout the interior or exterior of the structure.

Bulk samples were collected in discrete locations or in aeras which already had sustained water and/or physical damage.

**Assumptions**

SITEX assumed that the suspect asbestos attic insulation was focused on a portion of the attic where boards were placed over the ceiling joists on either side of the fireplace stack.

| SAMPLE NUMBER | SAMPLE LOCATION | SAMPLE DESCRIPTION | APPROXIMATE QUANTITY | CONDITION | ACCESSIBILITY | FRIABILITY | SAMPLE RESULTS |
|---|---|---|---|---|---|---|---|
| BA-AI-A1 | Attic Center North Side | Yellowish Attic Insulation | 133 SF | Good | Low | No | Positive |
| BA-AI-A2 | Attic Center North Side | | | Good | Low | Yes | Negative |
| BA-AI-A3 | Attic Center South Side | | | Good | Low | No | Negative |
| BA-CH-B1 | South Wall Covered Porch | White Chinking | 11 SF | Good | High | Yes | Negative |
| BA-CH-B2 | South Wall Covered Porch | | | Good | High | Yes | Negative |
| BA-CH-B3 | South Wall Covered Porch | | | Good | High | Yes | Negative |
| BA-WG-C1 | Transom Window | Off-White Window Glaze | 12 LF ( Two Panes) | N/A | N/A | N/A | No Sample |
| BA-WG-C2 | Transom Window | | | Good | Medium | Yes | Negative |
| BA-WG-C3 | Transom Window | | | Good | Medium | Yes | Positive |
| BA-WG-D1 | Attic Windows | Off-White Window Glaze | 146 LF (12 Panes) | Fair | Medium | No | Negative |
| BA-WG-D2 | Attic Windows | | | Fair | Medium | No | Negative |
| BA-DW-D3 | Attic Windows | | | Fair | Medium | Yes | Negative |
| BA-PL-E1 | Room D North Wall | White Plaster | 1,950 SF | Good | High | Yes | Negative |
| BA-PL-E2 | Room A/B North Wall | | | Good | High | No | Negative |
| BA-PL-E3 | Room A/B North Wall | | | Good | High | No | Negative |
| **BA-DW-F1*** | **Southeast Wall Covered Porch** | **Drywall with Joint Compound** | **495 SF** | **Good** | **High** | **No** | **Positive** |
| **BA-DW-F2*** | **Southeast Wall Covered Porch** | | | **Good** | **High** | **No** | **Positive** |
| **BA-DW-F3*** | **Southeast Wall Covered Porch** | | | **Good** | **High** | **No** | **Positive** |

| SAMPLE NUMBER | SAMPLE LOCATION | SAMPLE DESCRIPTION | APPROXIMATE QUANTITY | CONDITION | ACCESSIBILITY | FRIABILITY | SAMPLE RESULTS |
|---|---|---|---|---|---|---|---|
| **BA-DW-G1**** | **Restroom Southwest Corner Wall** | **Drywall with Joint Compound** | **225 SF** | **Good** | **High** | **No** | **Positive** |
| **BA-DW-G2**** | **Restroom Southeast Corner Wall** | | | **Good** | **High** | **No** | **Positive** |
| **BA-DW-G3**** | **Restroom East Wall** | | | **Good** | **High** | **No** | **Positive** |
| BA-MO-H1 | Fireplace Mortar (soft) | Light Gray Fireplace Mortar | 40 LF | Good | Medium | No | Negative |
| BA-MO-H2 | Fireplace Mortar (soft) | | | Good | Medium | No | Negative |
| BA-MO-H3 | Fireplace Mortar (soft) | | | Good | Medium | No | Negative |
| BA-ST-I1 | Beneath Front Porch | White Exterior Stucco | 950 SF | Fair | Low | No | Negative |
| BA-ST-I2 | Beneath Front Porch | | | Fair | Low | No | Negative |
| BA-ST-I3 | Beneath Front Porch | | | Fair | Low | No | Negative |
| BA-WG-J1 | South Front Porch | White Window Glaze | 180 LF (12 Panes) | Fair | High | No | Negative |
| BA-WG-J2 | South Front Porch | | | Fair | High | No | Negative |
| BA-WG-J3 | West Exterior Room D | | | Fair | High | No | Negative |
| BA-WG-K1 | North Exterior | White Window Glaze | 205 LF (12 Panes) | Poor | Low | Yes | Negative |
| BA-WG-K2 | North Exterior | | | Poor | Low | Yes | Negative |
| BA-WG-K3 | North Exterior | | | Poor | Low | Yes | Negative |
| BA-DG-L1 | South Front Door | Brown Door Glaze | 163 LF (9 Panes) | Good | High | No | Negative |
| BA-DG-L2 | South Front Door | | | Good | High | No | Negative |
| BA-DG-L3 | South Front Door | | | Good | High | No | Negative |

| SAMPLE NUMBER | SAMPLE LOCATION | SAMPLE DESCRIPTION | APPROXIMATE QUANTITY | CONDITION | ACCESSIBILITY | FRIABILITY | SAMPLE RESULTS |
|---|---|---|---|---|---|---|---|
| BA-MS-M1 | Room D | Black Mastic | 36 SF | Poor | High | No | Negative |
| BA-MS-M2 | Room D | | | Poor | High | No | Negative |
| BA-MS-M3 | Room D | | | Poor | High | No | Negative |
| BA-FM-N1 | Fireplace Flue Mortar | Off-White Fireplace Mortar | 5 LF | Good | Low | No | Negative |
| BA-FM-N2 | Fireplace Flue Mortar | | | Good | Low | No | Negative |
| BA-FM-N3 | Fireplace Flue Mortar | | | Good | Low | No | Negative |

*Notes*:
Listed items in **Bold** denote asbestos containing building materials (ACBMs).
The United States Environmental Protection Agency (U.S. EPA) has defined an asbestos material to contain equal to or greater than one percent asbestos.
The Occupational Safety and Health Administration (OSHA) has determined asbestos detected at any level is a potential health exposure hazard.
Bulk samples were analyzed using Polarized Light Microscopy (PLM) by a trained McCrone Research Institute microscopist
PLM Methodology using United States Environmental Protection Agency (U.S. EPA) EPA/600/R-93/116 based on a total visual estimated weight percentage.
* = Asbestos found in the joint compound of the drywall joint compound bulk sample.
** = Asbestos found in the surface texture and joint compound of the drywall joint compound bulk sample.
Bulk samples ending with 1/2/3 denote each sample collected per homogeneous sample set.
Negative = A non-regulated material containing less than one percent asbestos (<1%).
Positive = A regulated material containing asbestos equal to or greater than one percent (>1%).
SF = Square feet.
LF = Linear feet.
N/A = Not applicable.
No Sample = Denotes missing bulk sample (empty sample baggie) when logged into the laboratory for analysis.

# ASBESTOS SAMPLING AND ANALYTICAL PROCEDURES

Random bulk samples, representative of the suspect asbestos-containing building materials of each homogeneous area, were collected. Representative sampling is based on the following criteria:

1. The distribution of the suspect material throughout the homogeneous area.
2. The suspect material's physical characteristics and application.
3. Random sampling patterns determined for each homogeneous area.

Suspect materials, sampled and analyzed should be considered to be representative of materials in each homogeneous area if:

1. They exhibit similar physical characteristics. (i.e. color, texture).
2. The application of the sampled material can be correlated to the application of unsampled material by physical appearance and time of application.

All bulk samples collected were analyzed using the Environmental Protection Agency's Method for the Detection of Asbestos in Bulk Samples (EPA 600/M4-82020, December 1982) and the McCrone Research Institute's The Asbestos Particle Atlas as method references.

The bulk samples were collected on November 16 and 17, 2020. A total of 42 bulk samples were collected by Robert H. Hill II for asbestos analysis. SITEX was responsible for determining if asbestos was present on the exterior and interior of the structure and if present, provide estimated quantities of asbestos materials found. The samples, along with the proper Chain-of-Custody forms were sent to SITEX Environmental Solutions, Inc. (SITEX) for bulk sample analysis. The analysis of the bulk samples was performed on November 18, 2020 to November 24, 2020. SITEX uses McCrone Institute certified microscopist and is an environmental laboratory. A copy of the McCrone Institute microscopists credentials are included in this report as Appendix E – Laboratory and Accreditations and Individual Certifications.

# XRF LEAD-BASED PAINT SURVEY SUMMARY

The XRF lead paint survey shots are included in this report and summarized in Appendix C – XRF Lead Paint Summary. An X-ray Fluorescence analyzer spectrum (XRF) was used for the lead survey. The InnoV-X Systems Delta Standard (model DS-2000, Serial #501736) was calibrated by the manufacturer. A copy of XRF Manufacturer's calibration and the field calibration is included with this report as Appendix D – XRF Certificate of Calibration.

## Assumptions

SITEX assumed that pre-manufactured, anodized or baked-on surfaces were not LBP due to the paint composition and processes. Therefore, no shots were taken of the gray interior power panels.

Typically, these materials contain negligible amounts of lead which are below the regulated threshold limits for LBP. These materials are usually classified as lead-containing materials (LCM).

Except for the restroom and attic windows, SITEX is assuming all exterior windows on the first floor are LBP (window trim and window frames) based on shots taken.

SITEX is assuming that all walls and baseboards in Room D were LBP based on shots taken.

## XRF Lead Shot Sample Identification and Documentation

Each lead shot taken was immediately recorded onto the Lead Paint Survey field log sheet. The following paragraphs provide an explanation of the terms used on the lead paint survey log sheet.

### Lead Survey Paint Field Log Sheet

The lead paint survey field log sheet includes the shot number, shot location, a description of the building component shot, its condition, paint substrate, paint color, XRF shot results, positive/negative, and estimated quantity. The following paragraphs provide an explanation of the above-mentioned terms used on the lead paint survey data sheet.

### Shot Number

The shot number is a three-digit sequential number beginning with 001. The shot number includes pre- and post-calibration shots, and quality control shots (duplicates or re-takes). An example of the numbering sequence is as follows:

001 = First shot taken for the lead survey

### Shot Location

Describes the shot's physical location of the painted building component within the facility exterior or interior.

### Component

Describes the painted building component material being tested.

### Condition

Describes the physical condition of the building component material. Two physical conditions exist which include intact or deteriorated as described in these categories.

Intact: Exterior surfaces with large surface areas with no deteriorated paint.

Intact: Interior surfaces with large surface areas with no deteriorated paint.

Intact: Interior and Exterior components with small surface area with no deteriorated paint.

Deteriorated: Exterior components with large surface area more than 10 square feet of deteriorated paint or, Interior components with large surface more than 2 square feet of deteriorated paint or interior and exterior components with small surface area more than 10 percent (10%) of the total surface area of the component.

**Substrate**

Defines the composition of the material (concrete, metal, wood, plastic) to which the paint is adhered to.

**Color**

Provides the physical description of the color of the painted building component. Color helps the lead-risk assessor determine homogenous areas (similar painting history), and can assist with certain types of older paint known to contain lead (battleship gray, red).

**Results**

Shows the units of measure for the painted building component. For purposes of this survey, the XRF direct-reading instrument displays the lead content in milligrams per square centimeter ($mg/cm^2$). This unit of measure can be directly compared to the federal HUD guideline definition of LBP.

**Positive/Negative**

The determination of whether a painted component is positive or negative is given by the XRF direct-reading measurement displayed in $mg/cm^2$. Painted building components which are equal to (=) or greater than (>) 1.0 $mg/cm^2$ are considered to be lead-based paint (LBP). LBP is regulated under the United States Environmental Protection Agency (USEPA), HUD federal regulatory lead standards, and State of Missouri lead regulations.

Painted building components which do not exceed (<) 1.0 $mg/cm^2$ are not considered to be LBP and are not regulated. However, the Occupational Safety and Health Administration (OSHA) regulates lead exposure to workers. OSHA considers any amount of lead in a painted building component to be a lead-containing material (LCM). According to OSHA, LCMs have the potential to create lead exposure hazards to workers.

For purposes of this survey the following terms will be used to represent the following:

Positive: Painted component which contains > or = 1.0 mg/cm$^2$ lead content.
Negative: Painted component which contains < 1.0 mg/cm$^2$ lead content.

Painted components which are listed as positive are LBP; these materials are regulated.

Painted components which are negative are LCM; these materials are non-regulated.

**Quantity**

The approximate estimated quantities of the lead building component expressed as square feet (SF), linear feet (LF), or each (Each).

Pre- and post-calibration shots do not have a quantity associated with these shots.

**Regulatory Guidance**

Lead-based paint is considered 1.0 milligrams per square centimeter (mg/cm$^2$) for the XRF instrumentation, or 0.5 lead percent by weight (% weight) if a physical lead paint chip sample had been collected.

Lead testing combinations were followed in accordance with the federal United States Department of Urban and Housing Development (HUD) guidelines. The XRF instrument was pre- and post-calibrated using a manufactured coin, a negative plastic-coated lead template (SRM 2570), and a positive plastic-coated lead template (SRM 2573).

According to the Resource Conservation Recovery Act (RCRA) for Lead-Based Paint (LBP) renovation/demolition activities, general construction debris which contains lead must be analyzed by the Toxicity Characteristic Leaching Procedure (TCLP) to determine toxicity. Construction debris that exceeds 5 parts per million (ppm) will be disposed of as hazardous waste. Construction debris that is below 5 ppm is considered to be non-hazardous and be disposed into a sanitary landfill.

The Occupational Safety and Health Administration (OSHA) has determined that any level of lead in a substance is defined as a Lead Containing Material (LCM). When disturbing LCMs the contractor is held to specific work practices and employee protection in accordance with the Lead in Construction Standard 20CFR 1926.62.

# LBP PAINT SAMPLING AND ANALYTICAL PROCEDURES

The direct-reading shots were taken on November 16, 2020 and November 17, 2020. A total of 291 shots were taken by State of Missouri Lead Risk-Assessor Robert Hill II. SITEX did not collect paint chip samples because the direct-reading instrument had no inconclusive readings. SITEX identified

26 painted building components which were identified with LBP on the interior and exterior of the structure. SITEX identified 98 painted building components whose lead containing materials or LCM on the interior and/or exterior.

# UNIVERSAL HAZARDOUS MATERIALS INVENTORY

SITEX took an inventory of hazardous materials which were observed on the interior of the structure. The inventory is summarized below with the materials identified.

| ***Material Identification*** | ***Location*** | ***Estimated Quantities*** |
|---|---|---|
| Plus 3 Joint Compound | Basement | 5 Pound Bag |
| Sunny Side Paint Thinner | Basement | 1 Gallon |
| Quick Wall Surface Bonding Cement | Basement | 10 Pounds |
| Gold Bond Gypsolite | Basement | 10 Pounds |
| Fluorescent Light Ballast | First Floor | 4 Ballast |
| Fluorescent Light Bulbs | First Floor | 8 Bulbs (Two / light Fixture) |

# CONCLUSIONS AND RECOMMENDATIONS

SITEX performed an asbestos and LBP survey of Beauvais Amoureux House located at 327 Saint Mary's Road in Sainte Genevieve, Missouri in preparation of planned demolition and renovation. SITEX presents the following conclusions and recommendations.

**Identified Asbestos Containing Materials (ACM)**

Based on the bulk samples collected and review of laboratory analytical results the following ACM was identified on the interior of the building.

| ***Bulk Sample Number*** | ***Floor*** | ***Location*** | ***Estimated Quantities*** |
|---|---|---|---|
| BA-DW-F1/2/3 | First Floor | Covered Porch | 495 Square Feet (SF) |
| BA-DW-G1/2/3 | First Floor | Restroom | 225 SF |

**Identified Lead-Based Paint Building Components**

| Shot Number | Shot Location | Result | Estimated Quantity |
|---|---|---|---|
| 004 | Room D | Door Frame | 17 LF |
| 005 | Room D | Door | 1 Each (~35 SF) |
| 007 | Room D | Wall | 560 SF |
| 014 | Room D | Wall | 560 SF |
| 017 | Room D | Shelf | ~25 LF |
| 021 | Room D | Wall | 560 SF |
| 022 | Room D | Window Trim | 3 Each |
| 023 | Room D | Window | 3 Each |
| 028 | Room C | Window | 1 Each |
| 032 | Room C | Door Frame | 2 Each (~34 LF) |
| 053 | Room D | Baseboard | ~64 LF |
| 082 | Covered Porch | Window | 6 Each |
| 093 | Covered Porch | Transom Window | 1 Each |
| 097 | Covered Porch | Ceiling | ~350 SF |
| 114 | Hallway | Door | 1 Each (~35 SF) |
| 115 | Hallway | Transom Window | 1 Each |
| 143 | Room A/B | Window Frame | 2 Each |
| 221 | Front Porch | Window | 3 Each |
| 223 | Front Porch | Window Frame | 3 Each |
| 226 | Front Porch | Door Trim | 1 Each (~17 LF) |
| 227 | Front Porch | Door Frame | 1 Each (~17 LF) |
| 229 | Front Porch | Door | 1 Each (~35 LF) |
| 232 | Front Porch | Window | 3 Each |
| 233 | Front Porch | Window Trim | 3 Each |
| 236 | Front Porch | Window Frame | 3 Each |
| 237 | Front Porch | Window Trim | 3 Each |

## Recommendations

### ACM

Asbestos Containing Building Materials (ACBM) were found on the interior of the Subject Property. At the time of the site reconnaissance, the observed suspect ACBM was in excellent condition. Prior to future planned renovation/demolition activities, suspect or confirmed ACBM should be removed by a Missouri licensed asbestos abatement contractor.

### LBP

Lead-based paints were found to be present on the interior and exterior of the Subject Property. SITEX recommends that these materials be stabilized and/or removed by a State of Missouri lead abatement contractor prior to the demolition/renovation activities.

Additionally, the results indicate that some of the paint does contain lead below 1.0 mg/cm$^2$. The Occupational Safety & Health Administration (OSHA) regulations require proper handling and safety precautions when working with any amount of lead-containing paint. SITEX recommends that the use of cutting equipment that will raise the temperature of the lead-containing surface above 250$^o$ F be prohibited.

### Universal Hazardous Materials

SITEX recommends that these materials be properly packaged and labeled and disposed off-site by a licensed waste hauler prior to the demolition/renovation activities.

## SURVEY TEAM

The representative for SITEX Environmental, Inc. conducting the survey was Robert H. Hill II. Mr. Hill is accredited in Missouri as an asbestos inspector and Lead Risk Assessor. Mr. Hill's certifications are included in Appendix E – Laboratory Accreditations and Individual Certifications of this report.

### Limitations

One bulk sample (BA-WG-C1) was missing at the time when the bulk samples were analyzed. The bulk sample likely fell out of the sampling bag in the field during collection. However, the bulk sample collected is deemed a miscellaneous sample by industry sampling protocols which requires at least one sample per U.S. EPA guidelines. The homogeneous set contained two bulk samples (BA-WG-C2 and BA-WG-C3). The number of bulk samples collected is more than enough for bulk sample analysis and is representative for asbestos content determination.

### Disclaimer

These results do not imply nor deny conditions that may have existed prior to our sampling or previous inspections. This survey and sampling were performed in a thorough and professional manner consistent with industry standards.

The ACM and LBP survey are representative of bulk samples collected and XRF shots taken at the time of the survey. SITEX performed limited destructive sampling. The analytical results are valid only for the bulk samples collected and the XRF shots taken.

If during renovation and/or demolition activities, additional suspect asbestos and/or lead is

uncovered, SITEX recommends that a State of Missouri licensed asbestos or lead inspector collect a bulk sample for analysis to determine the presence of asbestos or taken additional shots to determine the presence of lead.

The Asbestos and Lead-Based Paint (LBP) Survey Team consisted of the following State of Missouri licensed individuals.

Surveyed by:

Robert Hill II
Missouri Asbestos Inspector
Missouri Certificate #7118020416MOSR2164

Missouri Lead Risk Assessor
Missouri Certificate #01057-200133036

**FIGURE**

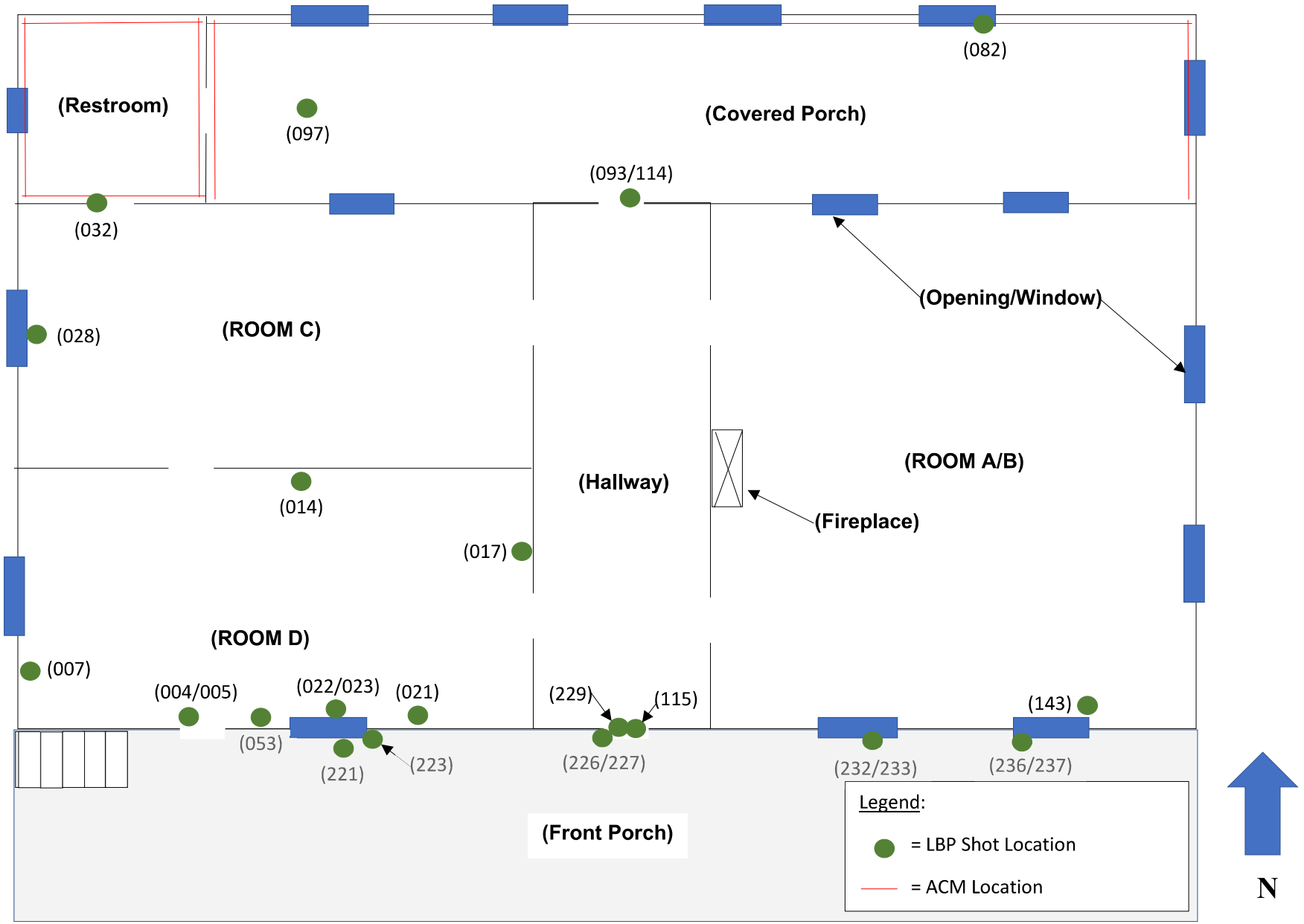
Asbestos and Lead Bulk Sample Locations

**APPENDICES**

Appendix A – SITEX Laboratory PLM Analysis Reports
Appendix B – Photograph Log
Appendix C – XRF Lead Paint Summary Log Sheets
Appendix D – XRF Certificate of Calibration
Appendix E – Laboratory Accreditation and Individual Certifications

# FIGURE

# Beauvvais Amoureux Log/Timber Floor Plan
# Asbestos Bulk Sampling and Lead-Based Paint Shot Locations



# APPENDIX A

# SITEX LABORATORY PLM ANALYSIS REPORT

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St. Louis, Missouri 63104
Phone: (314) 421-0600
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**Your Sole Provider of Environmental Health & Safety Services**

# POLARIZED LIGHT MICROSCOPY ANALYSIS REPORT

**(Method : EPA/600/R-93/116)**

Project No.: 16276
Report No.: 20-11-0024
Project Name: Beauvis Amoureux House

Date Received: 11/16/2020
Date Analyzed: 11/18-11/24/2020
Customer PO:

Customer: GEI Consultants, Ltd.
Contact: Robert Hill II
Phone: 314-421-0600

| Sample Info | | Client Provided Information | | Analytical Info | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|---|---|---|---|
| Sample No. | Sample ID | Sample Description | Material Type | Appearance | Texture | Color | % Non-Fibrous | % Fibrous | % Type |
| 00204 | BA-AI-A1 | Attic Insulation | Insulation | Homogeneous, Fibrous | Grainy, Fibrous | Tan | 1-5% (other) | 90-95% Mineral Wool | None Detected |
| 00205 | BA-AI-A2 | Attic Insulation | Insulation | Homogeneous, Fibrous | Grainy, Fibrous | Tan | 1-5% (other) | 90-95% Mineral Wool | None Detected |
| 00206 | BA-AI-A3 | Attic Insulation | Insulation | Homogeneous, Fibrous | Grainy, Fibrous | Tan | 1-5% (other) | 90-95% Mineral Wool | None Detected |
| 00207 | BA-CH-B1 | White Chinking Interior Wall | Chinking | Homogeneous, Non-Fibrous | Rough | White | 10-20% Perlite 80-90% (other) | | None Detected |
| 00208 | BA-CH-B2 | White Chinking Interior Wall | Chinking | Homogeneous, Non-Fibrous | Rough | White | 10-20% Perlite 80-90% (other) | | None Detected |
| 00209 | BA-CH-B3 | White Chinking Interior Wall | Chinking | Homogeneous, Non-Fibrous | Rough | White | 10-20% Perlite 80-90% (other) | | None Detected |
| 00210 | BA-WG-C1 | Off-White Window Glaze | Sample Not Submitted | | | | | | |
| 00211 | BA-WG-C2 | Off-White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | Off-White | >95% (other) | | None Detected |
| 00212 | BA-WG-C3 | Off-White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | Off-White | >95% (other) | | None Detected |
| 00213 | BA-WG-D1 | Off-White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | Off-White | >95% (other) | | None Detected |
| 00214 | BA-WG-D2 | Off-White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | Off-White | >95% (other) | | None Detected |
| 00215 | BA-WG-D3 | Off-White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | Off-White | >95% (other) | | None Detected |
| 00216 | BA-PL-E1 | White Plaster Throughout | Plaster | Hetrogenous, Non-Fibrous | Rough | White | 20-30% Quartz 70-80% (other) | | None Detected |

ANALYST:

REVIEWED BY: Robert H Hill II

**Laboratory Disclaimer:**
**The test data only pertains to the items tested. No assumptions or conclusions should be made to materials or samples not analyzed in this report.**
**SITEX maintains liability limited to cost of analysis.**
**Interpretation and uses of test results are the responsibility of the client.**
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# POLARIZED LIGHT MICROSCOPY ANALYSIS REPORT

**(Method : EPA/600/R-93/116)**

Project No.: 16276
Report No.: 20-11-0024
Project Name: Beauvis Amoureux House

Date Received: 11/16/2020
Date Analyzed: 11/18-11/24/2020
Customer PO:

Customer: GEI Consultants, Ltd.
Contact: Robert Hill II
Phone: 314-421-0600

| Sample Info | | Client Provided Information | | Analytical Info | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|---|---|---|---|
| Sample No. | Sample ID | Sample Description | Material Type | Appearance | Texture | Color | % Non-Fibrous | % Fibrous | % Type |
| 00216A | BA-PL-E1 | White Plaster Throughout | Plaster | Hetrogenous, Non-Fibrous | Rough | White | 10-20% Perlite 80-90% (other) | | None Detected |
| 00216B | BA-PL-E1 | White Plaster Throughout | Plaster | Hetrogenous, Non-Fibrous | Rough | Gray | 1-5% Hair 90-95% (other) | | None Detected |
| 00217 | BA-PL-E2 | White Plaster Throughout | Plaster | Hetrogenous, Non-Fibrous | Rough | White | 10-20% Perlite 80-90% (other) | | None Detected |
| 00217A | BA-PL-E2 | White Plaster Throughout | Plaster | Hetrogenous, Non-Fibrous | Rough | Gray | 1-5% Hair 90-95% (other) | | None Detected |
| 00218 | BA-PL-E3 | White Plaster Throughout | Plaster | Hetrogenous, Non-Fibrous | Rough | White | 10-20% Perlite 80-90% (other) | | None Detected |
| 00218A | BA-PL-E3 | White Plaster Throughout | Plaster | Hetrogenous, Non-Fibrous | Rough | Gray | 1-5% Hair 90-95% (other) | | None Detected |
| 00219 | BA-DW-F1 | Drywall w/Joint Compound | Joint Compound | Homogeneous, Non-Fibrous | Smooth | White | 10-20% Perlite 80-90% (other) | | None Detected |
| 00219A | BA-DW-F1 | Drywall w/Joint Compound | Joint Compound | Homogeneous, Non-Fibrous | Smooth | Tan | >95% (other) | | 1-5% Chrysotile |
| 00219B | BA-DW-F1 | Drywall w/Joint Compound | Drywall | Homogeneous, Non-Fibrous | Smooth | White | 10-20% Cellulose 80-90% (other) | | None Detected |
| 00220 | BA-DW-F2 | Drywall w/Joint Compound | Joint Compound | Homogeneous, Non-Fibrous | Smooth | White | 10-20% Perlite 80-90% (other) | | None Detected |
| 00220A | BA-DW-F2 | Drywall w/Joint Compound | Joint Compound | Homogeneous, Non-Fibrous | Smooth | Tan | >95% (other) | | 1-5% Chrysotile |
| 00220B | BA-DW-F2 | Drywall w/Joint Compound | Drywall | Hetrogenous, Non-Fibrous | Smooth | White | 10-20% Cellulose 80-90% (other) | | None Detected |
| 00221 | BA-DW-F3 | Drywall w/Joint Compound | Joint Compound | Homogeneous, Non-Firous | Smooth | White | 10-20% Synthetic 10-20% Perlite 70-80% (other) | | None Detected |

ANALYST:

REVIEWED BY: Robert H. Hill II

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# POLARIZED LIGHT MICROSCOPY ANALYSIS REPORT

**(Method : EPA/600/R-93/116)**

Project No.: 16276
Report No.: 20-11-0024
Project Name: Beauvis Amoureux House

Date Received: 11/16/2020
Date Analyzed: 11/18-11/24/2020
Customer PO:

Customer: GEI Consultants, Ltd.
Contact: Robert Hill II
Phone: 314-421-0600

| Sample Info | | Client Provided Information | | Analytical Info | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|---|---|---|---|
| Sample No. | Sample ID | Sample Description | Material Type | Appearance | Texture | Color | % Non-Fibrous | % Fibrous | % Type |
| 00221A | BA-DW-F3 | Drywall w/Joint Compound | Joint Compound | Homogeneous, Non-Fibrous | Smooth | Tan | >95% (other) | | 1-5% Chrysotile |
| 00221B | BA-DW-F3 | Drywall w/Joint Compound | Drywall | Homogeneous, Non-Fibrous | Smooth | White | 10-20% Cellulose 80-90% (other) | | None Detected |
| 00222 | BA-DW-G1 | Drywall w/Joint Compound Texture | Texture | Homogeneous, Non-Fibrous | Smooth | Gray | >95% (other) | | 1-5% Chrysotile |
| 00222A | BA-DW-G1 | Drywall w/Joint Compound Texture | Joint Compound | Homogeneous, Non-Fibrous | Smooth | Tan | >95% (other) | | 1-5% Chrysotile |
| 00222B | BA-DW-G1 | Drywall w/Joint Compound Texture | Drywall | Homogeneous, Non-Fibrous | Smooth | White | 10-20% Cellulose 80-90% (other) | | None Detected |
| 00223 | BA-DW-G2 | Drywall w/Joint Compound Texture | Texture | Homogeneous, Non-Fibrous | Smooth | Gray | >95% (other) | | 1-5% Chrysotile |
| 00223A | BA-DW-G2 | Drywall w/Joint Compound Texture | Joint Compound | Homogeneous, Non-Fibrous | Smooth | Tan | >95% (other) | | 1-5% Chrysotile |
| 00223B | BA-DW-G2 | Drywall w/Joint Compound Texture | Drywall | Hetrogenous, Non-Fibrous | Smooth | White | 10-20% Cellulose 80-90% (other) | | None Detected |
| 00224 | BA-DW-G3 | Drywall w/Joint Compound Texture | Joint Compound | Homogeneous, Non-Fibrous | Smooth | Tan | >95% (other) | | 1-5% Chrysotile |
| 00224A | BA-DW-G3 | Drywall w/Joint Compound Texture | Drywall | Homogeneous, Non-Fibrous | Smooth | White | 10-20% Cellulose 80-90% (other) | | None Detected |
| 00225 | BA-MO-H1 | Fireplace Mortar | Mortar | Homogeneous, Non-Fibrous | Rough | Tan | >95% (other) | | None Detected |
| 00226 | BA-MO-H2 | Fireplace Mortar | Mortar | Homogeneous, Non-Fibrous | Rough | Tan | >95% (other) | | None Detected |
| 00227 | BA-MO-H3 | Fireplace Mortar | Mortar | Homogeneous, Non-Fibrous | Rough | Tan | >95% (other) | | None Detected |

ANALYST:

REVIEWED BY: Robert H Hill II

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Customer PO:

Customer: GEI Consultants, Ltd.
Contact: Robert Hill II
Phone: 314-421-0600

| Sample Info | | Client Provided Information | | Analytical Info | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|---|---|---|---|
| Sample No. | Sample ID | Sample Description | Material Type | Appearance | Texture | Color | % Non-Fibrous | % Fibrous | % Type |
| 00228 | BA-ST-I1 | Exterior Stucco | Stucco | Hetrogenous, Non-Fibrous | Rough | White | 10-20%Quartz 80-90% (other) | | None Detected |
| 00228A | BA-ST-I1 | Exterior Stucco | Adhesive | Homogeneous, Non-Fibrous | Tacky | Tan | >95% (other) | | None Detected |
| 00228B | BA-ST-I1 | Exterior Stucco | Plaster | Homogeneous, Non-Fibrous | Rough | Off-White | >95% (other) | | None Detected |
| 00229 | BA-ST-I2 | Exterior Stucco | Stucco | Hetrogenous, Non-Fibrous | Rough | White | 20-30% Quartz 70-80% (other) | | None Detected |
| 00229A | BA-ST-I2 | Exterior Stucco | Plaster | Homogeneous, Non-Fibrous | Rough | Off-White | >95% (other) | | None Detected |
| 00230 | BA-ST-I3 | Exterior Stucco | Stucco | Homogeneous, Non-Fibrous | Rough | White | 20-30% Quartz 70-80% (other) | | None Detected |
| 00230A | BA-ST-I3 | Exterior Stucco | Plaster | Homogeneous, Non-Fibrous | Rough | Off-White | >95% (other) | | None Detected |
| 00231 | BA-WG-J1 | White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | White | >95% (other) | | None Detected |
| 00232 | BA-WG-J2 | White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | White | >95% (other) | | None Detected |
| 00233 | BA-WG-J3 | White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | White | >95% (other) | | None Detected |
| 00234 | BA-WG-K1 | White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | White | >95% (other) | | None Detected |
| 00235 | BA-WG-K2 | White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | White | >95% (other) | | None Detected |
| 00236 | BA-WG-K3 | White Window Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | White | >95% (other) | | None Detected |

ANALYST:

REVIEWED BY: Robert H Hill II

**Laboratory Disclaimer:**
**The test data only pertains to the items tested. No assumptions or conclusions should be made to materials or samples not analyzed in this report.**
**SITEX maintains liability limited to cost of analysis.**
**Interpretation and uses of test results are the responsibility of the client.**
**This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by SITEX.**

1525 South Broadway
St. Louis, Missouri 63104
Phone: (314) 421-0600
Fax: (314) 421-0234

**Your Sole Provider of Environmental Health & Safety Services**

# POLARIZED LIGHT MICROSCOPY ANALYSIS REPORT

**(Method : EPA/600/R-93/116)**

Project No.: 16276
Report No.: 20-11-0024
Project Name: Beauvis Amoureux House

Date Received: 11/16/2020
Date Analyzed: 11/18-11/24/2020
Customer PO:

Customer: GEI Consultants, Ltd.
Contact: Robert Hill II
Phone: 314-421-0600

| Sample Info | | Client Provided Information | | Analytical Info | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|---|---|---|---|
| Sample No. | Sample ID | Sample Description | Material Type | Appearance | Texture | Color | % Non-Fibrous | % Fibrous | % Type |
| 00237 | BA-WG-L1 | Brown Door Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | Brown | >95% (other) | | None Detected |
| 00238 | BA-WG-L2 | Brown Door Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | Brown | >95% (other) | | None Detected |
| 00239 | BA-WG-L3 | Brown Door Glaze | Glaze | Homogeneous, Non-Fibrous | Smooth | Brown | >95% (other) | | None Detected |
| 00240 | BA-MS-M1 | Black Mastic | Mastic | Homogeneous, Fibrous | Tacky | Black | 30-40% (other) | 40-50% Cellulose<br>1-5% Synthetic | None Detected |
| 00241 | BA-MS-M2 | Black Mastic | Mastic | Homogeneous, Fibrous | Tacky | Black | 30-40% (other) | 40-50% Cellulose<br>1-5% Synthetic | None Detected |
| 00242 | BA-MS-M3 | Black Mastic | Mastic | Homogeneous, Fibrous | Tacky | Black | 30-40% (other) | 40-50% Cellulose<br>1-5% Synthetic | None Detected |
| 00243 | BA-FM-N1 | Fireplace Mortar | Mortar | Homogeneous, Non-Fibrous | Rough | Gray | 10-20% Quartz<br>80-90% (other) | | None Detected |
| 00244 | BA-FM-N2 | Fireplace Mortar | Mortar | Homogeneous, Non-Fibrous | Rough | Gray | 10-20% Quartz<br>80-90% (other) | | None Detected |
| 00245 | BA-FM-N3 | Fireplace Mortar | Mortar | Homogeneous, Non-Fibrous | Rough | Gray | 10-20% Quartz<br>80-90% (other) | | None Detected |

ANALYST:

REVIEWED BY: Robert H Hill II

**Laboratory Disclaimer:**
**The test data only pertains to the items tested. No assumptions or conclusions should be made to materials or samples not analyzed in this report.**
**SITEX maintains liability limited to cost of analysis.**
**Interpretation and uses of test results are the responsibility of the client.**
**This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by SITEX.**

# CHAIN OF CUSTODY / LABORATORY WORK REQUEST



SITEX Environmental Inc.
1525 S. Broadway
St. Louis, MO 63104-4014

Phone: (314) 421-0600
FAX: (314) 421-0234

Project Name: Beauvais Amoureux House
Project Address: 327 Saint Marys Road
Saine Genevieve, Missouri
63670

Project # : 16276
Contact : Robert Hill II

Invoice to: SITEX Environmental, Inc
1525 S. Broadway
St. Louis, Missouri 63104

Date : 11/16/2020
P.O. # : N/A

| | | | | | Matrix | | | | | Preservative | | | | | | Analysis Required | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | Description | Date/Time Sampled | # of Cont | Type | Bulk | Air | Water | Soil | Sludge | Unpres. | $HNO_3$ | NaOH | $H_2SO_4$ | HCl | Cold | PLM / DS | PLM - Composite | | | | | |
| BA-AI-A1/2/3 | Attic Insulation | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-CH-B1/2/3 | White Chinking Interior Wall | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-WG-C1/2/3 | Off-White Window Glaze | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-WG-D1/2/3 | Off-White Window Glaze | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-PL-E1/2/3 | White Plaster Throughout | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-DW-F1/2/3 | Drywall w/Joint Compound | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-DW-G1/2/3 | Drywall w/Joint Compound Texture | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-MO-H1/2/3 RHH | Fireplace Mortar | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-ST-I1/2/3 | Exterior Stucco | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-WG-J1/2/3 | White Window Glaze | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-WG-K1/2/3 | White Window Glaze | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-DG-L1/2/3 | Brown Door Glaze | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-MS-M1/2/3 | Black Mastic | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| BA-FM-N1/2/3 | Fireplace Mort | 11/16/2020 | 3 | Baggie | X | | | | | X | | | | | | X | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

Comments:

**Stop at first positive per homogeneous area sample.**

| Relinquished By | Date/Time | Received By | Date/Time |
|---|---|---|---|
| Robert H Hill II | 11/16/20 | X | 11/16/2020 4:42p |
| | | | |
| | | | |
| | | | |

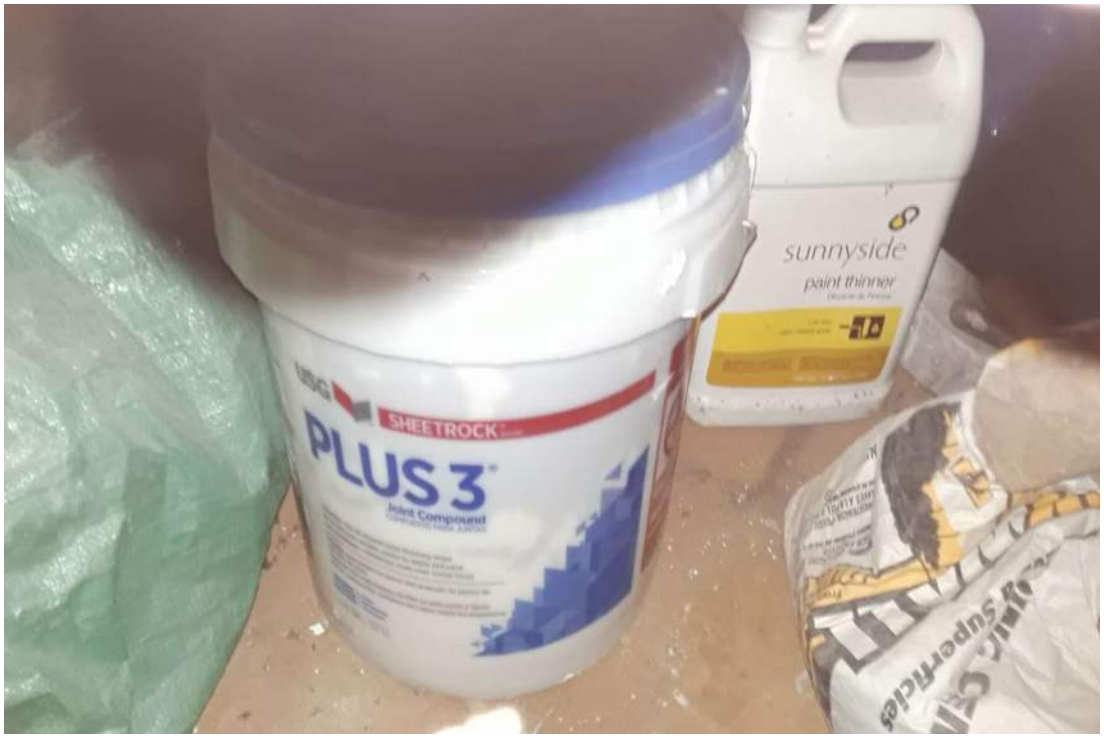
Turn Around Time

- ___ < 8 hours
- ___ Same Day
- ___ 24 hour
- ___ 48 hour
- X 3-5 Day

Samples Taken By
rhh

# APPENDIX B

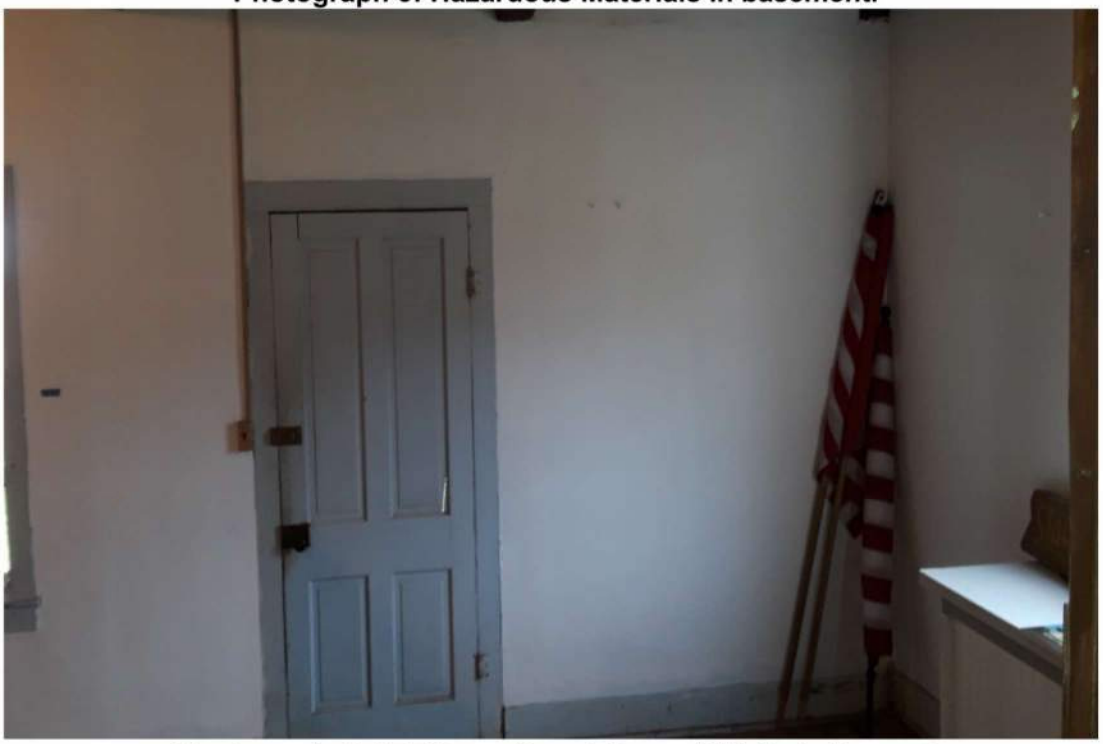
# PHOTOGRAPH LOG




**Photograph 1: Hazardous Materials in basement.**

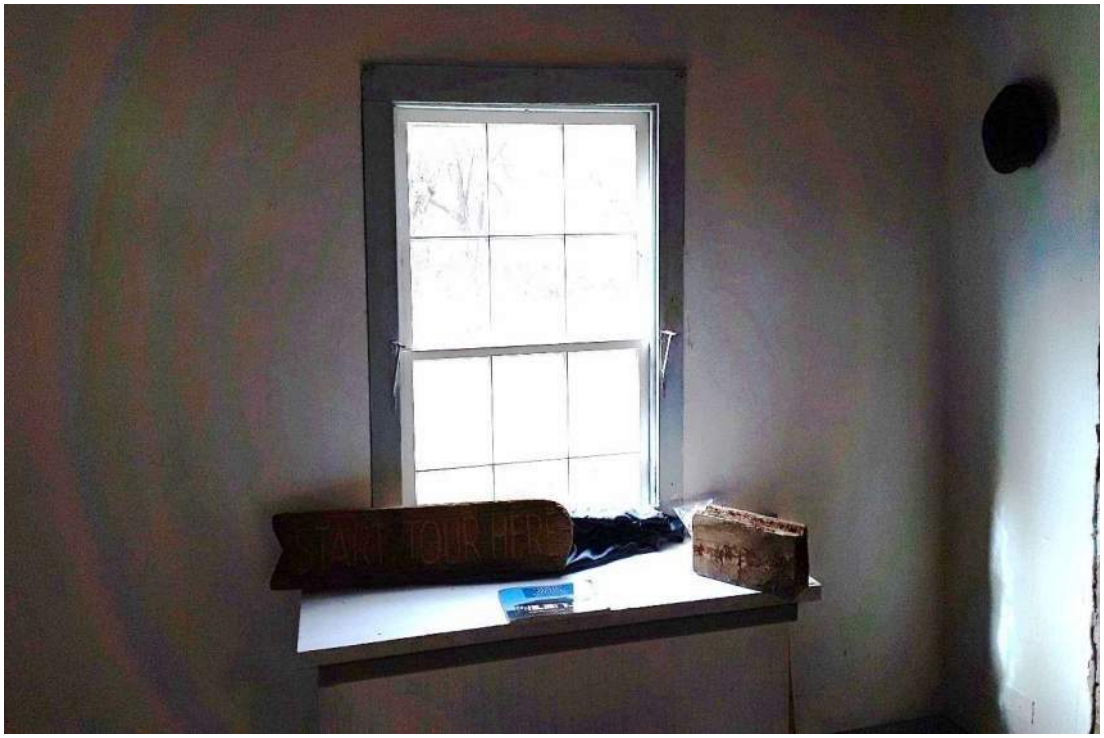
**Photograph 2: Hazardous Materials in basement.**

**Photograph 3: Hazardous Materials in basement.**



**Photograph 4: LBP Door, Door Trim and Walls in Room D.**

**Photograph 5: LBP Walls, door, door trim, windows, window trim and baseboard.**



**Photograph 6: LBP Walls, windows and window trim in Room D.**

**Photograph 7: LBP Door Frame in Room C.**

**Photograph 8: Room C Fluorescent light fixtures and ballast.**

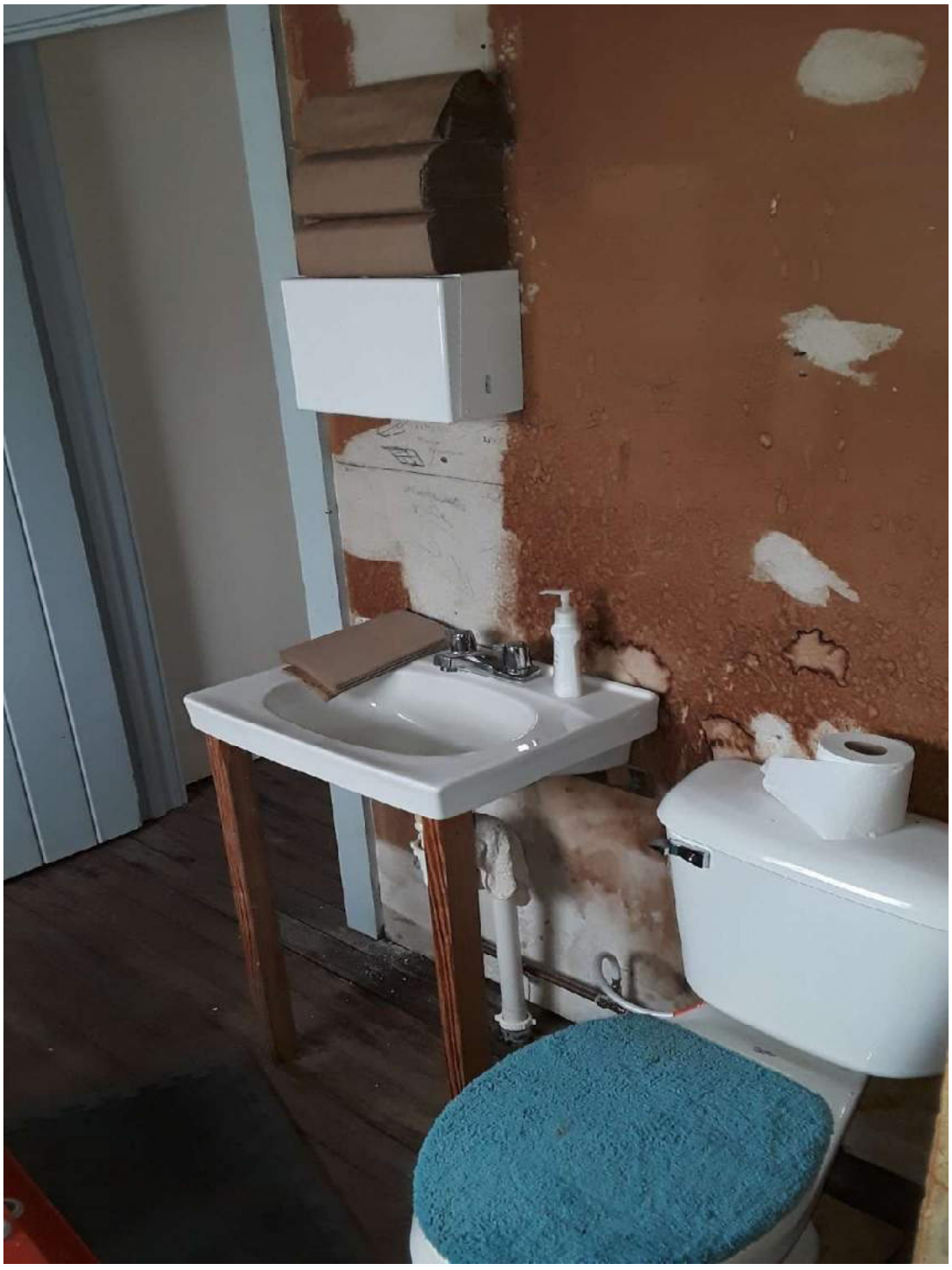
**Photograph 9: LBP Windows and asbestos drywall.**

**Photograph 10: LBP Transom above door in covered porch.**

**Photograph 11: LBP Hallway / main entrance door and transom window.**

**Photograph 12: LBP Window Frame (Assumed all window frames to be LBP) in Room A/B.**

**Photograph 13: Asbestos drywall with joint compound in restroom.**



**Photograph 14: Asbestos drywall with joint compound in restroom.**

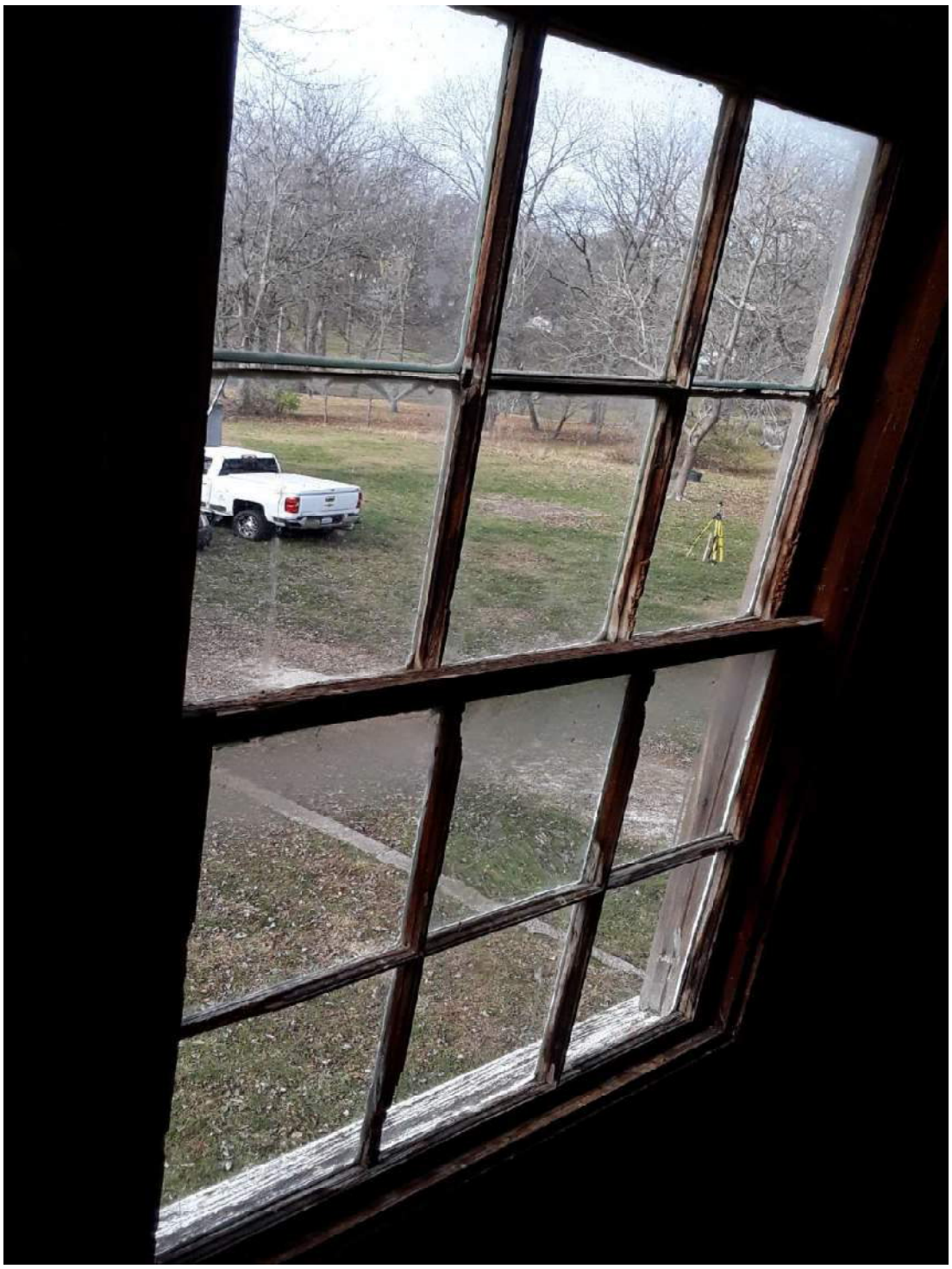
**Photograph 15: Asbestos drywall with joint compound in restroom.**

**Photograph 16: LBP windows, window frame, door and door trim front porch.**

**Photograph 17: LBP windows, window frame, door and door trim front porch.**

**Photograph 18: Typical view of attic showing fireplace and board across hallway below.**

**Photograph 19: Typical view of basement showing fireplace and floor joists and partial crawlspace.**



**Photograph 20: Typical view of attic window.**

**Photograph 21: View of the front of the log/timber structure facing north.**

**Photograph 22: View of back of house facing south.**

**Photograph 23: View of log/timber structure exterior east side.**

**Photograph 24: Exterior stucco beneath front porch.**

**Photograph 25: Exterior west side of the log/timber structure.**

# APPENDIX C

# XRF LEAD PAINT SUMMARY LOG SHEETS

# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 16, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| 001 | Calibration | Coin | Intact | Metal | Silver | Pass | NA | NA |
| 002 | Calibration | SRM 2570 | Intact | Plastic | White | 0.00±0.00 | NA | NA |
| 003 | Calibration | SRM 2573 | Intact | Plastic | Red | **1.35±0.08** | NA | NA |
| **004** | **Room D** | **Door Frame** | **Intact** | **Wood** | **Gray** | **1.42±0.10** | **Pos** | **17 LF** |
| **005** | **Room D** | **Door** | **Intact** | **Wood** | **Olive** | **1.28±0.08** | **Pos** | **~35 SF** |
| 006 | Room D | Door Trim | Intact | Wood | Grey | 0.36±0.01 | Neg | NA |
| **007** | **Room D** | **West Wall** | **Intact** | **Plaster** | **White** | **2.66±0.13** | **Pos** | **560 SF** |
| 008 | Room D | West Window Frame | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 009 | Room D | West Window | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 010 | Room D | West Window Sill | Intact | Wood | Grey | 0.22±0.02 | Neg | NA |
| 011 | Room D | North Door Trim | Intact | Wood | Brown | 0.32±0.03 | Neg | NA |
| 012 | Room D | Beam | Intact | Wood | Dr Brown | 0.00±0.00 | Neg | NA |
| 013 | Room D | Door Frame | Intact | Wood | Brown | 0.17+0.01 | Neg | NA |
| **014** | **Room D** | **North Wall** | **Intact** | **Plaster** | **White** | **4.5±0.00** | **Pos** | **560 SF** |
| 015 | Room D | Paneling | Intact | Wood | Brown | 0.24±0.02 | Neg | NA |
| 016 | Room D | Shelf | Intact | Wood | Dr Green | 0.77±0.04 | Neg | NA |
| **017** | **Room D** | **Shelf Brace** | **Intact** | **Wood** | **Green** | **2.33±0.09** | **Pos** | **~25 LF** |
| 018 | Room D | Panel Door | Intact | Wood | Brown | 0.15±0.01 | Neg | NA |
| 019 | Room D | Door Trim | Intact | Wood | Brown | 0.19±0.02 | Neg | NA |
| 020 | Room D | Door Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| **021** | **Room D** | **South Wall** | **Intact** | **Plaster** | **White** | **2.41±0.11** | **Pos** | **560 SF** |
| **022** | **Room D** | **Window Trim** | **Intact** | **Wood** | **Grey** | **2.43±0.02** | **Pos** | **3 Each** |
| **023** | **Room D** | **Window** | **Intact** | **Wood** | **White** | **4.12±0.13** | **Pos** | **3 Each** |
| 024 | Room D | Window Sill | Intact | Wood | Grey | 0.09±0.01 | Neg | NA |
| 025 | Room D | Floor | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 026 | Room C | Wall | Intact | Plaster | White | 0.16±0.04 | Neg | NA |
| 027 | Room C | Window Trim | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| **028** | **Room C** | **Window** | **Intact** | **Wood** | **White** | **2.56±0.13** | **Pos** | **1 Each** |
| 029 | Room C | Window Sill | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 030 | Room C | Window Frame | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 031 | Room C | Door | Intact | Wood | Grey | 0.34±0.01 | Neg | NA |
| **032** | **Room C** | **Door Frame** | **Intact** | **Wood** | **Brown** | **2.76±0.14** | **Pos** | **2 Each** |
| 033 | Room C | Door Trim | Intact | Wood | Grey | 0.32±0.01 | Neg | NA |
| 034 | Room C | North Wall | Intact | Plaster | White | 0.20±0.00 | Neg | NA |

# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 16, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| 035 | Room C | Window Frame | Intact | Wood | Grey | 0.58±0.01 | Neg | NA |
| 036 | Room C | Window Trim | Intact | Wood | Grey | 0.20±0.00 | Neg | NA |
| 037 | Room C | Window Sill | Intact | Wood | Grey | 0.23+0.00 | Neg | NA |
| 038 | Room C | North Baseboard | Intact | Wood | Grey | 0.41±0.00 | Neg | NA |
| 039 | Room C | Beam | Intact | Wood | Dr Brown | 0.00±0.00 | Neg | NA |
| 040 | Room C | Panel Wall | Intact | Wood | Brown | 0.20±0.00 | Neg | NA |
| 041 | Room C | Door Trim | Intact | Wood | Brown | 0.05±0.00 | Neg | NA |
| 042 | Room C | Door Frame | Intact | Wood | Brown | 0.06±0.00 | Neg | NA |
| 043 | Room C | Threshold | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 044 | Room C | Baseboard East | Intact | Wood | Brown | 0.13±0.00 | Neg | NA |
| 045 | Room C | Floor | Intact | Wood | Dr Brown | 0.25±0.00 | Neg | NA |
| 046 | Room C | Floor | Intact | Wood | Lt Brown | 0.00±0.00 | Neg | NA |
| 047 | Room C | Outlet | Intact | Metal | Brown | 0.00±0.00 | Neg | NA |
| 048 | Room C | (N1) Post | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 049 | Room C | Shelf | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 050 | Room C | Shelf Bracket | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 051 | Room C | Crown Molding | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 052 | Room C | Ceiling | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| **053** | **Room D** | **Baseboard** | **Intact** | **Wood** | **Grey** | **1.11±0.05** | **Pos** | **~64 LF** |
| 054 | Bathroom | Door Trim | Intact | Wood | Grey | 0.10±0.00 | Neg | NA |
| 055 | Bathroom | Window Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 056 | Bathroom | Window Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 057 | Bathroom | Window | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 058 | Bathroom | Window Sill | Intact | Wood | Brown | 0.01±0.00 | Neg | NA |
| 059 | Bathroom | Door | Intact | Wood | Grey | 0.56±0.00 | Neg | NA |
| 060 | Bathroom | Door Trim | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 061 | Bathroom | Door Frame | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 062 | Bathroom | Door Panel | Intact | Metal | Grey | 0.00±0.00 | Neg | NA |
| 063 | Bathroom | Sink | Intact | Porcelain | White | 0.01±0.00 | Neg | NA |
| 064 | Bathroom | Toilet | Intact | Porcelain | White | 0.01±0.00 | Neg | NA |
| 065 | Bathroom | Towel Dispencer | Intact | Metal | White | 0.00±0.00 | Neg | NA |
| 066 | Bathroom | Celing | Intact | Wood | Brown | 0.07±0.00 | Neg | NA |
| 067 | Back Porch | North Wall | Intact | Drywall | White | 0.00±0.00 | Neg | NA |
| 068 | Back Porch | Window Trim | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |

# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 16, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| 069 | Back Porch | Window Frame | Intact | Wood | Blue | 0.03±0.00 | Neg | NA |
| 070 | Back Porch | Window | Intact | Wood | Blue | 0.11±0.01 | Neg | NA |
| 071 | Back Porch | Window Sill | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 072 | Back Porch | Window Trim | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 073 | Back Porch | Window Frame | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 074 | Back Porch | Window | Intact | Wood | Blue | 0.05±0.00 | Neg | NA |
| 075 | Back Porch | Window Sill | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 076 | Back Porch | Window Trim | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 077 | Back Porch | Window Frame | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 078 | Back Porch | Window | Intact | Wood | Blue | 0.07±0.00 | Neg | NA |
| 079 | Back Porch | Window Sill | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 080 | Back Porch | Window Trim | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 081 | Back Porch | Window Frame | Intact | Wood | Blue | 0.11±0.02 | Neg | NA |
| **082** | **Back Porch** | **Window** | **Intact** | **Wood** | **Blue** | **5.00±0.34** | **Pos** | **6 Each** |
| 083 | Back Porch | Window Sill | Intact | Wood | Blue | 0.02±0.00 | Neg | NA |
| 084 | Back Porch | Window Trim | Intact | Wood | Blue | 0.01±0.00 | Neg | NA |
| 085 | Back Porch | Window Frame | Intact | Wood | Blue | 0.12±0.01 | Neg | NA |
| 086 | Back Porch | Window | Intact | Wood | Blue | 0.08±0.00 | Neg | NA |
| 087 | Back Porch | Window Sill | Intact | Wood | Blue | 0.04±0.00 | Neg | NA |
| 088 | Back Porch | Window Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 089 | Back Porch | Window Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 090 | Back Porch | Shutter | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 091 | Back Porch | Door Trim | Intact | Wood | Brown | 0.07±0.00 | Neg | NA |
| 092 | Back Porch | Door Frame | Intact | Wood | Brown | 0.30±0.00 | Neg | NA |
| **093** | **Back Porch** | **Transom** | **Intact** | **Wood** | **Brown** | **1.07±0.06** | **Pos** | **1 Each** |
| 094 | Back Porch | Window Trim | Intact | Wood | Grey | 0.10±0.00 | Neg | NA |
| 095 | Back Porch | Window Frame | Intact | Wood | Grey | 0.25±0.03 | Neg | NA |
| 096 | Back Porch | Window Sill | Intact | Wood | Grey | 0.11±0.00 | Neg | NA |
| **097** | **Back Porch** | **Ceiling** | **Intact** | **Wood** | **Brown** | **1.12±0.09** | **Pos** | **~350 SF** |
| 098 | Back Porch | Diffuser | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 099 | Back Porch | Floor | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 100 | Hallway | Transom | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 101 | Back Porch | East Wall | Intact | Drywall | White | 0.00±0.00 | Neg | NA |
| 102 | Back Porch | West Wall | Intact | Drywall | White | 0.00±0.00 | Neg | NA |

# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 16, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| 103 | Hallway | Door Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 104 | Hallway | North Wall | Intact | Plaster | White | 0.00±0.00 | Neg | NA |
| 105 | Hallway | East Wall | Intact | Plaster | White | 0.00±0.00 | Neg | NA |
| 106 | Hallway | Door Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 107 | Hallway | Door Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 108 | Hallway | Threshold | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 109 | Hallway | Baseboard | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 110 | Hallway | Door Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 111 | Hallway | Door Frame | Intact | Wood | Brown | 0.35±0.07 | Neg | NA |
| 112 | Hallway | South Wall | Intact | Plaster | White | 0.00±0.00 | Neg | NA |
| 113 | Hallway | Door Trim | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| **114** | **Hallway** | **Door** | **Intact** | **Wood** | **Grey** | **5.00±0.47** | **Pos** | **1 Each** |
| **115** | **Hallway** | **Transom** | **Intact** | **Wood** | **Grey** | **5.00±0.51** | **Pos** | **1 Each** |
| 116 | Hallway | Floor | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 117 | Hallway | Paneling | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 118 | Hallway | Door Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 119 | Hallway | Door Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 120 | Hallway | Baseboard | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 121 | Hallway | Ceiling | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 122 | Calibration | Coin | Intact | Metal | Silver | Pass | NA | NA |
| 123 | Calibration | SRM 2570 | Intact | Plastic | White | 0.00±0.00 | NA | NA |
| 124 | Calibration | SRM 2573 | Intact | Plastic | Red | 1.12±0.07 | NA | NA |
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# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 17, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| 125 | Calibration | Coin | Intact | Metal | Silver | Pass | NA | NA |
| 126 | Calibration | SRM 2570 | Intact | Plastic | White | 0.00±0.00 | NA | NA |
| 127 | Calibration | SRM 2573 | Intact | Plastic | Red | 1.16±0.03 | NA | NA |
| 128 | Hallway | Air Return | Intact | Metal | White | 0.00±0.00 | Neg | NA |
| 129 | Room AB | North Wall | Intact | Plaster | White | 0.00±0.00 | Neg | NA |
| 130 | Room AB | Baseboard | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 131 | Room AB | East Wall | Intact | Plaster | White | 0.00±0.00 | Neg | NA |
| 132 | Room AB | Window Trim | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 133 | Room AB | Window Frame | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 134 | Room AB | Window | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 135 | Room AB | Window Sill | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 136 | Room AB | Window Trim | Intact | Wood | Brown | 0.06±0.00 | Neg | NA |
| 137 | Room AB | Window Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 138 | Room AB | Window | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 139 | Room AB | Window Sill | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 140 | Room AB | South Wall | Intact | Plaster | White | 0.00±0.00 | Neg | NA |
| 141 | Room AB | Baseboard | Intact | Wood | Brown | 0.05±0.00 | Neg | NA |
| 142 | Room AB | Window Trim | Intact | Wood | Brown | 0.06±0.00 | Neg | NA |
| **143** | **Room AB** | **Window Frame** | **Intact** | **Wood** | **Brown** | **3.36±0.23** | **Pos** | 2 Each |
| 144 | Room AB | Window | Intact | Wood | White | 0.5±0.00 | Neg | NA |
| 145 | Room AB | Window Sill | Intact | Wood | Brown | 0.10±0.00 | Neg | NA |
| 146 | Room AB | Outlet | Intact | Metal | Brown | 0.01±0.00 | Neg | NA |
| 147 | Room AB | Window Trim | Intact | Wood | Brown | 0.04±0.00 | Neg | NA |
| 148 | Room AB | Window Frame | Intact | Wood | Brown | 0.24±0.00 | Neg | NA |
| 149 | Room AB | Window | Intact | Wood | White | 0.01±0.00 | Neg | NA |
| 150 | Room AB | Window Sill | Intact | Wood | Brown | 0.08±0.00 | Neg | NA |
| 151 | Room AB | West Wall | Intact | Plaster | White | 0.00±0.00 | Neg | NA |
| 152 | Room AB | South Door Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 153 | Room AB | North Door Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 154 | Room AB | Fireplace Mantle | Intact | Wood | Brown | 0.01±0.00 | Neg | NA |
| 155 | Room AB | Ceiling | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 156 | Room AB | Floor | Intact | Wood | Lt Brown | 0.00±0.00 | Neg | NA |
| 157 | Room AB | Diffuser | Intact | Metal | Dr Brown | 0.01±0.00 | Neg | NA |
| 158 | Room AB | Diffuser | Intact | Metal | Dr Brown | 0.00±0.00 | Neg | NA |

# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 17, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| 159 | Room AB | Log Stand | Intact | Metal | Olive | 0.07±0.00 | Neg | NA |
| 160 | Attic | Truss | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 161 | Attic | Rafter | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 162 | Attic | Purlin | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 163 | Attic | Floor Plank | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 164 | Attic | Top Plate | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 165 | Attic | Porch Rafter | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 166 | Attic | West Window Frame | Det | Wood | Brown | 0.00±0.00 | Neg | NA |
| 167 | Attic | West Window | Det | Wood | Brown | 0.00±0.00 | Neg | NA |
| 168 | Attic | West Window Sill | Det | Wood | White | 0.00±0.00 | Neg | NA |
| 169 | Attic | East Window Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 170 | Attic | East Window | Intact | Wood | White | 0.11±0.02 | Neg | NA |
| 171 | Basement | Ceiling | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 172 | Basement | Joist | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 173 | Basement | Support Beam | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 174 | Basement | Support Post | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 175 | Basement | Retaining Wall | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 176 | Basement | Footing | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 177 | Basement | Footing | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 178 | Basement | Footing | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 179 | Basement | Footing | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 180 | Basement | Footing | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 181 | Basement | Footing | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 182 | Basement | Footing | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 183 | Basement | South Wall | Intact | Timber/Mud | Grey | 0.00±0.00 | Neg | NA |
| 184 | Basement | West Wall | Intact | Stone | Grey | 0.00±0.00 | Neg | NA |
| 185 | Basement | Footing | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 186 | Basement | Footing | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 187 | Basement | Footing | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 188 | Basement | Footing | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 189 | Basement | Footing | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 190 | Basement | Footing | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 191 | Basement | Footing | Intact | Metal | White | 0.00±0.00 | Neg | NA |
| 192 | Basement | North Wall | Intact | Timber/Mud | Grey | 0.00±0.00 | Neg | NA |

# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 17, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| 193 | Basement | East Wall | Intact | Timber/Mud | Grey | 0.00±0.00 | Neg | NA |
| 194 | Basement | North Fireplace | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 195 | Basement | South Fireplace | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 196 | Basement | Door | Det | Wood | Grey | 0.20±0.00 | Neg | NA |
| 197 | Basement | Door Frame | Det | Wood | Grey | 0.00±0.00 | Neg | NA |
| 198 | Basement | Door Trim | Det | Wood | Grey | 0.08±0.00 | Neg | NA |
| 199 | East Exterior | East Foundation | Intact | Rock | White | 0.00±0.00 | Neg | NA |
| 200 | South Exterior | South Foundation | Det | Stucco | White | 0.01±0.00 | Neg | NA |
| 201 | South Exterior | South Porch Wall | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 202 | Porch | Porch Post | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 203 | Porch | Porch Rail | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 204 | Porch | Porch Floor Joist | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 205 | Porch | Porch Floor | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 206 | Porch | Porch Stair Rail | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 207 | Porch | Porch Step Tread | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 208 | Porch | Porch Step Stringer | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 209 | Porch | Porch Trim Board | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 210 | Porch | Porch Ceiling | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 211 | Porch | Porch Ceiling Joist | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 212 | Porch | Porch Step Post | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 213 | Porch | Attic Stair Tread | Det | Wood | Brown | 0.00±0.00 | Neg | NA |
| 214 | Porch | Attic Stair Riser | Det | Wood | Brown | 0.00±0.00 | Neg | NA |
| 215 | Porch | Attic Stair Stringer | Det | Wood | Dr Brown | 0.00±0.00 | Neg | NA |
| 216 | Porch | Attic Stair Post | Det | Wood | Dr Brown | 0.00±0.00 | Neg | NA |
| 217 | Porch | Wall | Intact | Plaster | White | 0.00±0.00 | Neg | NA |
| 218 | Porch | Door Trim | Intact | Wood | Grey | 0.05±0.00 | Neg | NA |
| 219 | Porch | Window Shutter | Intact | Wood | Grey | 0.22±0.01 | Neg | NA |
| 220 | Porch | Window Trim | Intact | Wood | Grey | 0.53±0.04 | Neg | NA |
| **221** | **Porch** | **Window** | **Intact** | **Wood** | **White** | **3.43±0.29** | **Pos** | **3 Each** |
| 222 | Porch | Window Sill | Intact | Wood | Grey | 0.40±0.00 | Neg | NA |
| **223** | **Porch** | **Window Frame** | **Intact** | **Wood** | **Grey** | **1.02±0.01** | **Pos** | **3 Each** |
| 224 | Porch | Shelf | Det | Wood | Brown | 0.00±0.00 | Neg | NA |
| 225 | Porch | Shelf Support | Det | Wood | Brown | 0.00±0.00 | Neg | NA |
| **226** | **Porch** | **Door Trim** | **Intact** | **Wood** | **Grey** | **1.04±0.01** | **Pos** | **1 Each** |

# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 17, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| **227** | **Porch** | **Door Frame** | **Intact** | **Wood** | **Grey** | **1.02±0.01** | **Pos** | **1 Each** |
| 228 | Porch | Transom | Intact | Wood | Grey | 0.44±0.04 | Neg | NA |
| **229** | **Porch** | **Door** | **Intact** | **Wood** | **Olive** | **5.00±0.67** | **Pos** | **1 Each** |
| 230 | Porch | Window Shutter | Intact | Wood | Grey | 0.34±0.06 | Neg | NA |
| 231 | Porch | Window Frame | Intact | Wood | Grey | 0.39±0.08 | Neg | NA |
| **232** | **Porch** | **Window** | **Intact** | **Wood** | **White** | **3.23±0.37** | **Pos** | **3 Each** |
| **233** | **Porch** | **Window Trim** | **Intact** | **Wood** | **Grey** | **1.45±0.11** | **Pos** | **3 Each** |
| 234 | Porch | Window Sill | Intact | Stucco | Grey | 0.04±0.00 | Neg | NA |
| 235 | Porch | Window Shutter | Intact | Wood | Grey | 0.01±0.00 | Neg | NA |
| **236** | **Porch** | **Window Frame** | **Intact** | **Wood** | **Grey** | **1.47±0.18** | **Pos** | **3 Each** |
| **237** | **Porch** | **Window Trim** | **Intact** | **Wood** | **Grey** | **1.03±0.01** | **Pos** | **3 Each** |
| 238 | Porch | Window | Intact | Wood | White | 0.21±0.02 | Neg | NA |
| 239 | Porch | Window Sill | Intact | Wood | Grey | 0.29±0.03 | Neg | NA |
| 240 | Porch | Downspout | Intact | Metal | Grey | 0.04±0.00 | Neg | NA |
| 241 | West Exterior | Lap Siding | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 242 | West Exterior | Window Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 243 | West Exterior | Window Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 244 | West Exterior | Window | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 245 | West Exterior | Window Sill | Det | Wood | Brown | 0.00±0.00 | Neg | NA |
| 246 | West Exterior | Window Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 247 | West Exterior | Window Frame | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 248 | West Exterior | Window | Det | Wood | White | 0.25±0.03 | Neg | NA |
| 249 | West Exterior | Window Sill | Det | Wood | Brown | 0.00±0.00 | Neg | NA |
| 250 | West Exterior | Window Trim | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 251 | West Exterior | Window | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 252 | West Exterior | Window Sill | Det | Wood | White | 0.00±0.00 | Neg | NA |
| 253 | North Exterior | Foundation | Intact | Stucco | White | 0.00±0.00 | Neg | NA |
| 254 | North Exterior | Floor Joist | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 255 | North Exterior | Subfloor | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 256 | North Exterior | Post | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 257 | North Exterior | Lap Siding | Intact | Wood | Brown | 0.00±0.00 | Neg | NA |
| 258 | North Exterior | Window Trim | Det | Wood | Grey | 0.05±0.02 | Neg | NA |
| 259 | North Exterior | Window | Det | Wood | Yellow | 0.07±0.03 | Neg | NA |
| 260 | North Exterior | Window Sill | Det | Wood | Grey | 0.04±0.01 | Neg | NA |

# LEAD PAINT SURVEY

**Project Name:** Beauvais Amoureux House **Date Collected:** November 17, 2020

**On-Site Technician:** Robert Hill II **Project Number:** 16276

**Project Location:** 327 Saint Mary's Road **Instrument Used:** Olyumpus Innov-X

| SAMPLE | LOCATION | COMPONENT | CONDITION | SUBSTRATE | COLOR | RESULTS | POS/NEG | QUANTITY |
|---|---|---|---|---|---|---|---|---|
| 261 | North Exterior | Window Trim | Det | Wood | Grey | 0.05±0.001 | Neg | NA |
| 262 | North Exterior | Window | Det | Wood | Yellow | 0.11±0.02 | Neg | NA |
| 263 | North Exterior | Window Sill | Det | Wood | Grey | 0.02±0.00 | Neg | NA |
| 264 | North Exterior | Window Trim | Det | Wood | Grey | 0.09±0.01 | Neg | NA |
| 265 | North Exterior | Window | Det | Wood | Yellow | 0.28±0.03 | Neg | NA |
| 266 | North Exterior | Window Sill | Det | Wood | Grey | 0.05±0.00 | Neg | NA |
| 267 | North Exterior | Window Trim | Det | Wood | Grey | 0.09±0.01 | Neg | NA |
| 268 | North Exterior | Window | Det | Wood | Yellow | 0.16±0.03 | Neg | NA |
| 269 | North Exterior | Window Sill | Det | Wood | Grey | 0.02±0.00 | Neg | NA |
| 270 | East Exterior | Window Trim | Det | Wood | Grey | 0.00±0.00 | Neg | NA |
| 271 | East Exterior | Window | Det | Wood | Yellow | 0.00±0.00 | Neg | NA |
| 272 | East Exterior | Window Sill | Det | Wood | Grey | 0.00±0.00 | Neg | NA |
| 273 | East Exterior | Window Trim | Det | Wood | Grey | 0.00±0.00 | Neg | NA |
| 274 | East Exterior | Window Frame | Det | Wood | Grey | 0.00±0.00 | Neg | NA |
| 275 | East Exterior | Window | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 276 | East Exterior | Window Sill | Det | Wood | White | 0.00±0.00 | Neg | NA |
| 277 | East Exterior | Window Trim | Det | Wood | Grey | 0.00±0.00 | Neg | NA |
| 278 | East Exterior | Window Frame | Det | Wood | Grey | 0.00±0.00 | Neg | NA |
| 279 | East Exterior | Window | Intact | Wood | White | 0.00±0.00 | Neg | NA |
| 280 | East Exterior | Window Sill | Det | Wood | White | 0.00±0.00 | Neg | NA |
| 281 | East Exterior | Window Trim | Det | Wood | Grey | 0.01±0.00 | Neg | NA |
| 282 | East Exterior | Window Frame | Det | Wood | Grey | 0.02±0.00 | Neg | NA |
| 283 | East Exterior | Window | Intact | Wood | White | 0.74±0.002 | Neg | NA |
| 284 | East Exterior | Window Sill | Det | Wood | White | 0.08±0.02 | Neg | NA |
| 285 | West Exterior | Window Trim | Intact | Wood | Grey | 0.00±0.00 | Neg | NA |
| 286 | West Exterior | Window Frame | Det | Wood | Grey | 0.00±0.00 | Neg | NA |
| 287 | West Exterior | Window | Det | Wood | White | 0.00±0.00 | Neg | NA |
| 288 | West Exterior | Window Sill | Det | Wood | White | 0.00±0.00 | Neg | NA |
| 289 | Calibration | Coin | Intact | Metal | Brown | Pass | NA | NA |
| 290 | Calibration | SRM 2570 | Intact | Plastic | White | 0.00±0.00 | Neg | NA |
| 291 | Calibration | SRM 2573 | Intact | Plastic | Red | 1.17±0.08 | Pos | NA |
| | | | | | | | | |
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# APPENDIX D

# XRF CERTIFICATE OF CALIBRATION

OLYMPUS®

Your Vision, Our Future

Olympus America, Inc.
110 Magellan Circle
Webster, TX 77598
Tel: (281) 922-9300
Fax: (281) 922-9303
www.olympus-ims.com
ho.ani@olympus-ossa.com

| | |
|---|---|
| Date Certified: | 18-Mar-2019 |
| Certification Number: | 190567-01 |
| Serial Number: | 501736 |
| Model: | DS-2000 |
| Temperature: | 77 |
| Relative Humidity: | 38 |

This instrument was certified according to Olympus Scientific Solutions Americas calibration procedures. The calibration was verified using Certified Reference Materials produced by Analytical Reference Materials International (ARMI), NIST and/or other certified materials. The calibration materials are verified to be traceable and within their expiration date.

This instrument conforms to Olympus Scientific Solutions Americas Quality Assurance Standards.

Analyzer modes are tested to meet the criteria as listed on the associated certification page. OSSA does not require a specific certification interval, however the analyzer may be re-certified on a fixed schedule based on the end-user's requirements.

Joshua E Jongstad

Calibration Technician Signature

Certificates for these materials can be made available upon request.

| Certificate Number: 190567-01 | Serial Number: 501736 |
|---|---|
| Modes or Methods certified by this document | |

Modes / Methods: Soil
Lead Paint

**Mining, Mining Plus, Empirical , Fast ID and custom element addtions do not have specific quality control criteria. They have been verified to meet basic calibration standards. Empirial modes are customer configurable and may need reconfiguration after calibration.**

Certificates for these materials can be made available upon request.

# Soil Environmental/Exploration

**Certificate: 190567-01** **Serial Number: 501736**

| Standard | Description | Element | Requirement | | Assay | ± | Reported | P/F |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | | | | |
| RTC-408 | Metals in Soil | Ag | 400 | 650 | 500 | 15.1 | 510 | Pass |
| | | As | 400 | 650 | 500 | 15.1 | 449 | Pass |
| | | Hg | 400 | 600 | 500 | 15.1 | 497 | Pass |
| | | Pb | 400 | 600 | 500 | 15.1 | 460 | Pass |
| | | Se | 350 | 600 | 500 | 15.1 | 511 | Pass |
| NIST MED 2711a | NIST SRM 2711a Montana Soil | As | 50 | 200 | 107 | 5.0 | 92 | Pass |
| | | Cu | 105 | 175 | 140 | 2.0 | 141 | Pass |
| | | Pb | 1250 | 1550 | 1400 | 10.0 | 1356 | Pass |
| | | Zn | 340 | 488 | 414 | 11.0 | 417 | Pass |
| RTC-407 | Metals in Clay | Cr | 850 | 1150 | 1000 | 29.1 | 1035 | Pass |

Certificates for these materials can be made available upon request.

# Lead Paint

**Certificate Number: 190567-01** **Serial Number: 501736**

## Lead Paint without Shield

| Standard | Description | Element | Requirement | | Assay | ± | Reported | P/F |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | | | | |
| SRM 2575 | Green Lead Paint Film SRM 2575 | Pb | 0.200 | 0.400 | 0.307 | 0.021 | 0.33 | Pass |
| SRM 2573 | Red Lead Paint Film SRM 2573 | Pb | 0.950 | 1.140 | 1.040 | 0.064 | 1.06 | Pass |
| SRM 2572 | Orange Lead Paint Film SRM 2572 | Pb | 1.400 | 1.650 | 1.527 | 0.091 | 1.61 | Pass |

## Lead Paint with Shield

| Standard | Description | Element | Requirement | | Assay | ± | Reported | P/F |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | | | | |
| SRM 2575 | Green Lead Paint Film | Pb | 0.200 | 0.400 | 0.307 | 0.021 | 0.35 | Pass |
| SRM 2573 | Red Lead Paint Film SRM 2573 | Pb | 0.950 | 1.140 | 1.040 | 0.064 | 1.08 | Pass |
| SRM 2572 | Orange Lead Paint Film | Pb | 1.400 | 1.650 | 1.527 | 0.091 | 1.63 | Pass |

Certificates for these materials can be made available upon request.

# APPENDIX E

# LABORATORY ACCREDITATION AND INDIVIDUAL CERTIFICATIONS

Missouri Department of NATURAL RESOURCES
dnr.mo.gov

Michael L. Parson, Governor
Carol S. Comer, Director

March 17, 2020

Robert H Hill II
608 N 43rd St
Belleville, IL 62226

CERTIFICATION NUMBER:
**7118031320MOIR2164**

THIS CERTIFIES
**Robert H Hill II**
HAS COMPLETED THE CERTIFICATION REQUIREMENTS FOR
**Inspector**

APPROVED: **03/18/2020**
EXPIRES **03/18/2021**

TRAINING DATE: **03/13/2020**

Director of Air Pollution Control Program

RE: **Missouri Asbestos Occupation Certification C**

Enclosed is your certification card for Asbestos Inspector, as issued by the Asbestos Unit of the Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7118031320MOIR2164
Course Training Date: March 13, 2020
Missouri Certification Approval Date: March 18, 2020
Missouri Certification Expiration Date: March 18, 2021

**Note:**

- All Missouri-certified asbestos personnel must comply with the following statutes and regulations:
  - Sections 643.225 to 643.250, RSMo;
  - 10 CSR 10-6.241 *Asbestos Projects-Registration, Abatement, Notification, Inspection, Demolition, and Performance Requirements; and*
  - 10 CSR 10-6.250 *Asbestos Projects-Certification, Accreditation and Business Exemption Requirements.*
- To keep your occupation certification up-to-date, you must complete an annual refresher course and submit a renewal application each year.
- In order to be eligible to renew your certification, you must successfully complete a refresher course with a Missouri-accredited training provider within 12 months of the expiration date of your current training certificate. If you exceed this grace period, you will be required to retake a Missouri-accredited initial course in order to be eligible for Missouri certification.

To obtain a copy of the certification renewal application, or review regulations and requirements, please visit our website at http://dnr.mo.gov/env/apcp/asbestos/index.htm.

If you have any questions please call the Air Pollution Control Program at 573-751-4817.

**AIR POLLUTION CONTROL PROGRAM**

Director of Air Pollution Control Program

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# Missouri Department of NATURAL RESOURCES

dnr.mo.gov

Michael L. Parson, Governor

Carol S. Comer, Director

CERTIFICATION NUMBER
**7118060420MOSR2164**

THIS CERTIFIES
**Robert H Hill II**

HAS COMPLETED THE CERTIFICATION REQUIREMENTS FOR
**Supervisor**

APPROVED **06/15/2020** TRAINING DATE **06/04/2020**

EXPIRES **06/15/2021**

Director of Air Pollution Control Program

June 15, 2020

Robert H Hill II
608 North 43rd Street
Belleville, IL 62226

RE: **Missouri Asbestos Occupation Certification Card**

Enclosed is your certification card for Asbestos Supervisor, as issued by the Asbestos Unit of the Missouri Department of Natural Resources' Air Pollution Control Program.

Missouri Certification Number: 7118060420MOSR2164
Course Training Date: June 04, 2020
Missouri Certification Approval Date: June 15, 2020
Missouri Certification Expiration Date: June 15, 2021

**Note:**

- All Missouri-certified asbestos personnel must comply with the following statutes and regulations:
  - Sections 643.225 to 643.250, RSMo;
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If you have any questions please call the Air Pollution Control Program at 573-751-4817.

**AIR POLLUTION CONTROL PROGRAM**

Director of Air Pollution Control Program

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# STC SAFETY TRAINING CENTER
safetytrainingcenter.org

2539 Vandalia Street, Collinsville, IL 62234 * Phone: 618-855-8764

Environmental and Occupational Safety & Health Training

***Does hereby certify***

# Robert Hill II

1525 South Broadway, St. Louis, MO 63104

*has successfully completed an 8 hour course of instruction for re-certification under 29 CFR 1910.120*

## Hazardous Waste Operations and Emergency Response Manager Supervisor

| | |
|---|---|
| ***Class Date:*** | ***03/20/2020*** |
| ***Examination Date:*** | ***03/20/2020*** |
| ***STC Certificate Number:*** | ***STC-20200320-000024HWRMS*** |
| ***Certification Expiration:*** | ***03/20/2021*** |

*David M. Mendoza – President/Training Director*
*Certified Environmental Specialist*
*OSHA Authorized Instructor*

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*David M. Mendoza – President/Training Director*
*Certified Environmental Specialist*
*OSHA Authorized Instructor*

# STATE OF MISSOURI
# DEPARTMENT OF HEALTH AND SENIOR SERVICES

## LEAD OCCUPATION LICENSE REGISTRATION

Issued to:

# Robert H. Hill, II

The person, firm or corporation whose name appears on this certificate has fulfilled the requirements for licensure as set forth in the Missouri Revised Statutes 701.300-701.338, as long as not suspended or revoked, and is hereby authorized to engage in the activity listed below.

**Lead Risk Assessor**
Category of License

| | |
|---|---|
| Issuance Date: | **5/17/2019** |
| Expiration Date: | **5/17/2021** |
| License Number: | **010517-200133036** |

Randall W. Williams, MD, FACOG
Director
Department of Health and Senior Services

Lead Licensing Program, PO Box 570, Jefferson City, MO 65102

INSTITUTE OF HAZARDOUS MATERIALS MANAGEMENT

THIS CERTIFIES THAT

# ROBERT H. HILL

HAS SUCCESSFULLY MET ALL THE REQUIREMENTS OF EDUCATION, EXPERIENCE AND EXAMINATION, AND IS HEREBY DESIGNATED A

## CERTIFIED HAZARDOUS MATERIALS MANAGER
## CHMM

January 31, 2007
DATE OF CERTIFICATION

14171
CREDENTIAL NUMBER

January 31, 2023
CERTIFICATION EXPIRES

EXECUTIVE DIRECTOR

VALID SO LONG AS THIS CREDENTIAL IS RENEWED ACCORDING TO SCHEDULE AND IS NOT OTHERWISE REVOKED.

ANSI Accredited Program PERSONNEL CERTIFICATION

*Accredited by the American National Standards Institute and the Council of Engineering and Scientific Specialty Boards*

# McCRONE RESEARCH INSTITUTE

*certifies that*

## *Robert H. Hill, II*

*has successfully completed an intensive course of instruction in*

## *"Microscopical Identification of Asbestos"*

*given by the McCrone Research Institute*

*Presented this* 13th *day of* Jan. 1989

*3.5 CEU's*
*4.5 ABIH CM*

Robert D. McCrone

John G. Delly

# McCRONE RESEARCH INSTITUTE

*certifies that*

*Stuart S. Kinquist*

*has successfully completed an intensive course of instruction in*

*"Microscopical Identification of Asbestos"*

*given by the McCrone Research Institute*

*Presented this 19th day of February, 1988*

3.5 CEU's

John G. Delly

Walter McCrone

# Appendix H - Archeological Excavations Report

# PRELIMINARY REPORT ON EXCAVATIONS AT THE ST. GEMME BEAUVAIS/AMOUREUX HOUSE, STE. GENEVIEVE, MISSOURI

Excavations were conducted in selected areas adjacent to the St. Gemme Beauvais/Amoureux House in the town of Ste. Genevieve, Missouri, in the spring and early summer of 1996. These excavations were conducted in areas to potentially solve selected problems associated with the future restoration of the house.

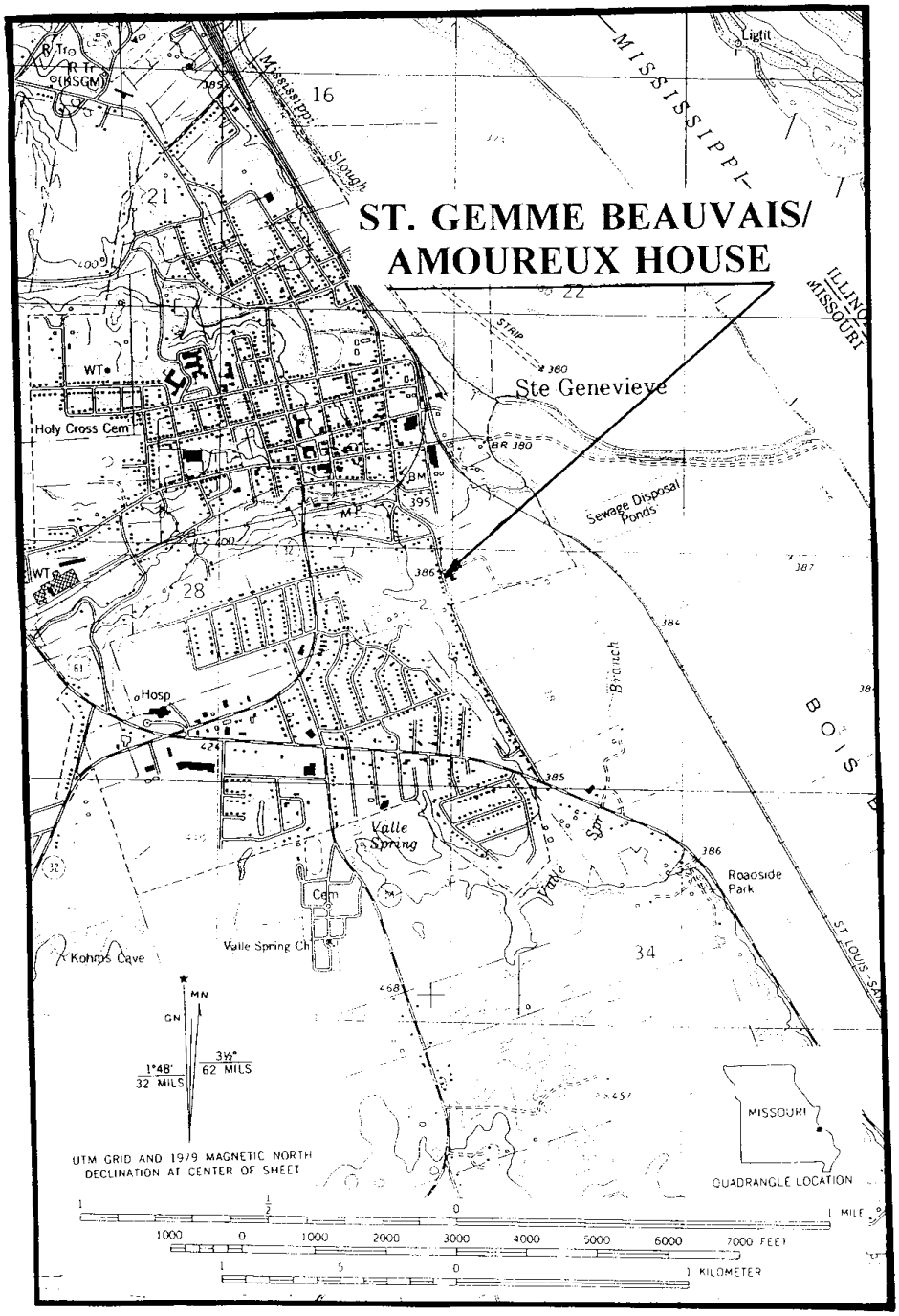
The St. Gemme Beauvais/Amoureux House located on St. Mary's Road in the south of portion of the town (Figure 1). The house was built ca. 1792 by Jean Baptiste St. Gemme Beauvais. The structure is a poteaux-en-terre building with vertical log wall construction. These vertical logs form the main load-bearing walls of the main portion of the structure. The roofing system is a massive Norman truss system. The porch roofs are lighter construction and hang from this truss system. The flooring system, rather than being supported from a sill on the walls, is supported from a sill laid on mortared stone piers, making the floor separate from the walls.

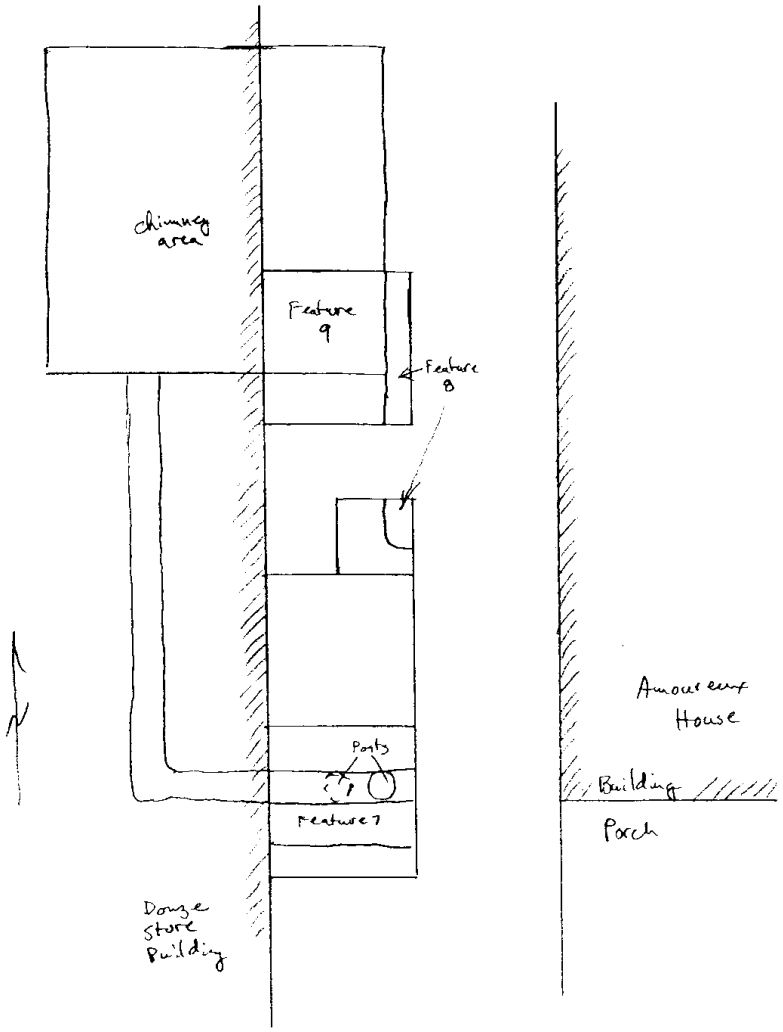
Numerous alterations have occurred to the structure through the years, probably masking its original configuration. A portion of the west side of the house had been removed, possibly the result of a fire. On the eastern side, the lower ends of the vertical logs had been sawn off, and a stone foundation put under them. The interior room configuration appears to have changed, probably after the removal of the western portion. In addition, the placement of the doorways has changed.

## West Excavations

In order to answer questions about the original size of the structure, excavations were placed on the west side of the house. As a store building had been constructed only six feet west of the house, the space available for excavation was limited. It was not certain if the outside wall would fall within this space or if it would be under the store building.

Three, one meter units and one, one-half meter unit was excavated along the edge of the store building (Figure 2). One unit was laid out to cross the south wall of the house on its intercept with the store foundation. The builder's trench and portions of two vertical cedar posts were encountered in the excavation unit. These posts had rotted in place and only the


ST. GEMME BEAUVAIS/
AMOUREUX HOUSE
Ste Genevieve
MISSISSIPPI
ILLINOIS
MISSOURI
Mississippi
Slough
Holy Cross Cem
Sewage Disposal Ponds
Hosp
Valle Spring
Valle Spr
Branch
Roadside Park
Cem
Valle Spring Ch
Kohrs Cave
ST. LOUIS SAN
BOIS
MN
GN
1°48'
32 MILS
3½°
62 MILS
UTM GRID AND 1979 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET
MISSOURI
QUADRANGLE LOCATION
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER


chimney area
Feature 9
Feature 8
Posts
Feature 7
Dongo store Building
Amoureux House
Building
Porch

lower ends in the earth were present. The builders trench continued on under the store foundation. A slanting hole was excavated in the sterile soil in the northwest corner of the unit and a solid wire probe inserted to try to reach the outside wall. As the builders trench encountered in the excavation unit contain significant amounts of limestone and mortar, it was hoped that a solid wire probe might be able to detect the outside wall. No contact was made with any material indicative of the outside wall. As the length of the solid wire was only three feet, it could not be determined if the wall was further out than that or alternately, that we simply did not make contact with any stone, mortar or wood.

As preliminary solid wire probing had indicated the possible presence of a chimney base along the center of the west side of the structure, the next excavation unit was placed to intercept the south side of the probable chimney base. The south side of this unit was two meters north of the first excavation unit. While the unit was placed along the side of the store building, it coincidentally intercepted the south side of the chimney, the front (east side) of the chimney, and the basement excavation. The stratigraphy of the excavation unit indicated a shallow surface zone to a depth of 10-13 cm b.s. Below that was a solid zone of coal 8-10 cm. thick. This coal blankets the entire area from the south excavation over the chimney excavation and extends for an undetermined to the north and south. Below that is a thin deposit of cultural material. At that point the south edge of the excavation for the chimney and the basement appeared. South of these excavations was undisturbed yellow loess. The fill of the chimney area and the basement were undifferentiated fill containing large quantities of cultural debris. One item recovered in this fill was an 1862 penny providing us with a no-earlier-than date for the fill. The depth of the excavation for the basement and the chimney were nearly the same, totalling 110 cm. at the west side of the chimney excavation and 105 cm. at the east edge in the basement excavation.

In order to determine the size of the excavation for the chimney, a solid wire survey was conducted to the north. This produced an approximate length of 225 cm. A soil core was driven to the west under the store building foundation to locate the back (western) side of the chimney excavation. This produced a total width of 235 cm. for the chimney excavation. The other chimney in the house is approximately 210 cm. N-S x 220 cm. E-W, making both of these chimneys nearly the same dimensions.

As the front edge of the basement excavation appeared in this excavation unit, it was then decided to find the turn in the basement excavation to the south. At this point, it was believed that the basement excavation would fall approximately 1.25 to 1.5 meters to the north of the south wall of the house. Another one meter square was excavated north of the unit falling over the wall trench on the south side of the house. This however failed to find the turn in the basement excavation. At this point a

one-half meter square was excavated on the northeast corner of the last excavation unit. The vertical excavation for the basement was located in this small excavation unit. However, no pier supporting the flooring system was located anywhere in the excavations.

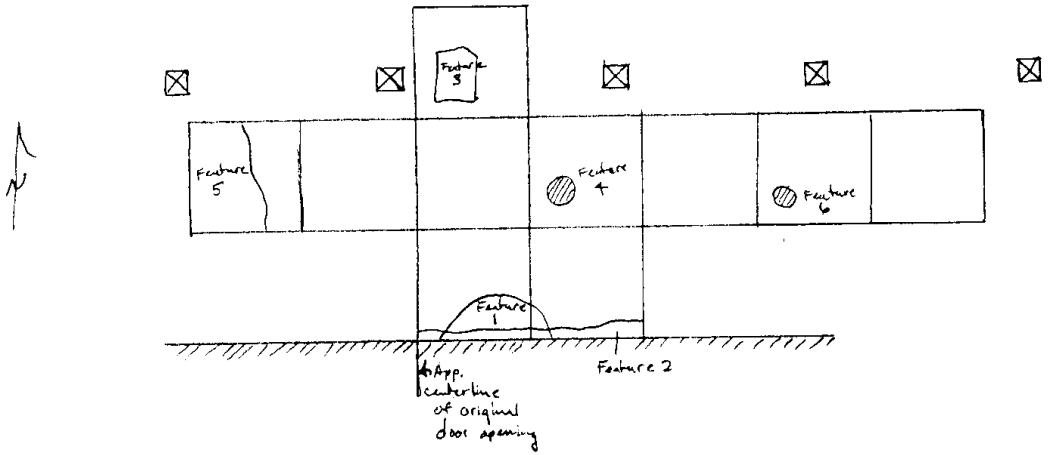
If we assume that the distance north of the south wall of the house where the basement excavation starts is approximately the same distance from the west wall, this would place the western wall approximately 65-70 cm. under the foundation of the store building. In order to determine how this would relate to the original interior room configurations, the ca. 22 feet length of the eastern room was replicated on the western side from the ceiling joist that contains the nail holes where the original partition was located. This places the western wall within one foot of the projected location on the basis of equal distance in for the basement wall excavation. Both of these would place the western wall near the center of the chimney portion of the chimney/hearth base. Naturally, without physically locating the western wall, this remains speculation.

North Excavations

The other major question to be answered was the original configuration of the porches (if any) and the original orientation of the house (front/back). As it was believed that the structure represented a French Canadian rather than a French Creole house, it was not believed that the large porches were original to the house. Excavations were conducted under the north and south porches in front of the original door openings to determine if there were other smaller porches or potentially simply steps up to the doorways.

Under the north porch, a total of 10, one meter units were excavated (Figure 3). Three units were excavated in a line north-south along the east side of the centerline of the original door opening. This line intersected the north side of the north porch. Then a crossline of seven units was placed across this line. It was anticipated that if there were a smaller porch, then the support structure would be located in this area. One probable posthole and one possible posthole were defined in this area. There is, however, no pattern to these posts, and they do not match with anything to the west side of the door opening. Both of these features were filled with plaster, coal, cinders, and wire nails, indicating that they were removed and backfilled approximately the turn of the 19th-20th centuries. It would appear that these features may well have more to do with scaffolding or support for remodeling than with the original structure or porches.

The most prominent series of features in the excavations was the excavation of one limestone pier and the probing out of a line of limestone piers all across the north side of the existing porch. These piers are rough fieldstone and do not appear to be


N
Feature 3
Feature 5
Feature 4
Feature 6
Feature 1
Feature 2
App. centerline of original door opening

formally dressed in any way.

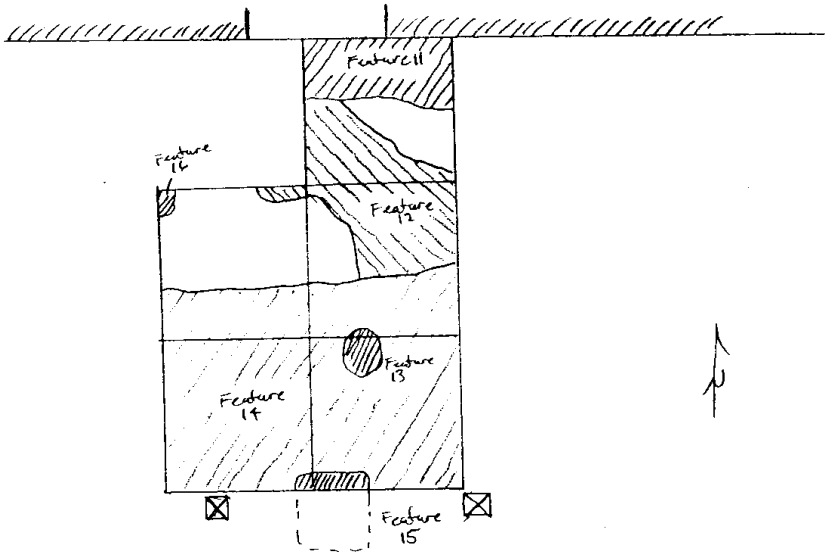
In examining the artifacts and their distribution, there are only two early period artifacts recovered in the excavated material. In addition, the distribution of artifacts indicates that almost all of the artifacts recovered in the excavations were post-1875. The distribution of artifacts shows a very low density under the porch with material density increasing very sharply to the north of the porch line. Based on the very low material density, particularly of early period artifacts, it would appear that the structure always had the large 8 foot porches it presently has and that the porch base was enclosed some way in its early history.

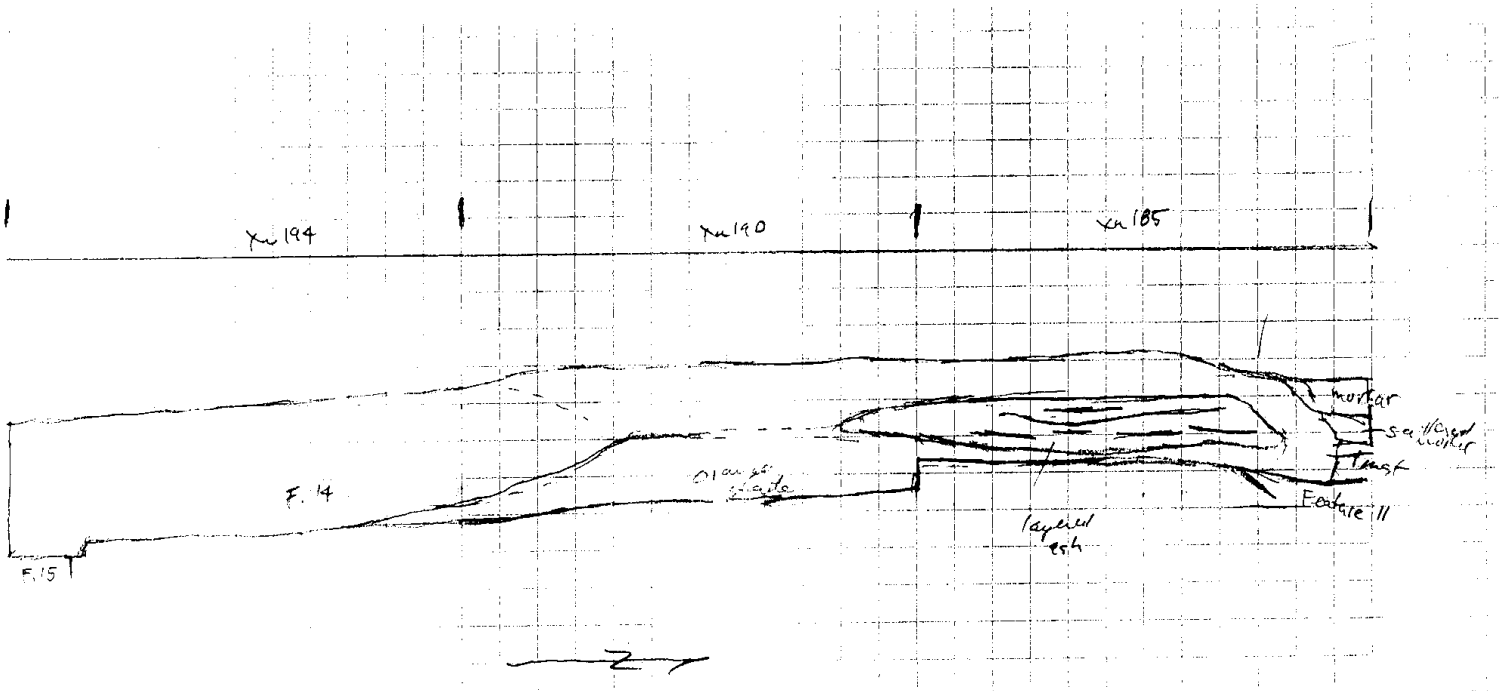
South Excavations

Excavations were also conducted under the south porch to try to determine if smaller porches were originally present. In addition, there was a small doorway under the original door opening into the house. It was believed that this might have been the original basement entryway. If there was a smaller porch, we wished to determine the configuration of these features. A total of 5, one-meter units were excavated under the north porch (Figure 4). These units were placed along the centerline of the original doorway opening, with three units north-south east of the centerline and two west of the centerline.

These units indicated a much more complex picture than those on the north side. On the north side, the builder's trench was narrow, only about ten cm. wider than the vertical wall posts. On the south side, the builder's trench was much wider, averaging ca. 35 cm from the south wall. There was no excavation below the small door opening into the basement. This small opening appears to have been not much larger than presently indicated. Sterile soil was reached only 15-17 cm below existing grade. There was a large, layered fan of ash coming from this opening and angling to the southeast. One possible posthole was encountered in the northwest corner of the excavation block. This extends all the way to the surface and is probably a late feature.

At approximately 1.6 meters south of the south wall of the house, there is a large, deep infilled feature. This feature appears to be an east-west trending feature which may run the full length of the front of the structure. While not certain what this feature represents, it looks like an infilled drainage channel. The infill of this feature is very late, i.e. post-dating 1950. A C-cell battery was recovered from -30 cm. near the front edge of the porch. A possible posthole was recorded in the base of this feature just east of the centerline. This possible posthole contained clay infill and contrasted sharply with the dark organic stained sterile soil. It could not be adequately determined if this was a rodent burrow or not.


Feature 11
Feature 16
Feature 12
Feature 13
Feature 14
Feature 15
N




Amoureux House
South Porch
X-S Profile R#205
West Edge Xn's 185, 190, 194
13 June '96
LDG

As with the north porch, the most interesting aspect of the south porch is a line of deeply buried porch piers directly under the existing porch line. These piers are buried at approximately -33 cm to the tops of the piers in the single excavated pier. A solid wire probe of the front indicated a line of piers spaced approximately every eight feet. All are deeply buried. Unlike the north piers, these are dressed limestone and are much larger. The single excavated pier was 59 x 47 cm. They are similar to the northern piers in that their long axes are north-south. These piers begin just inside the existing eastern side of the porch (ca. 50 cm.). There is another possible pier ca. eight feet to the east, but time did not permit the excavation of this feature.

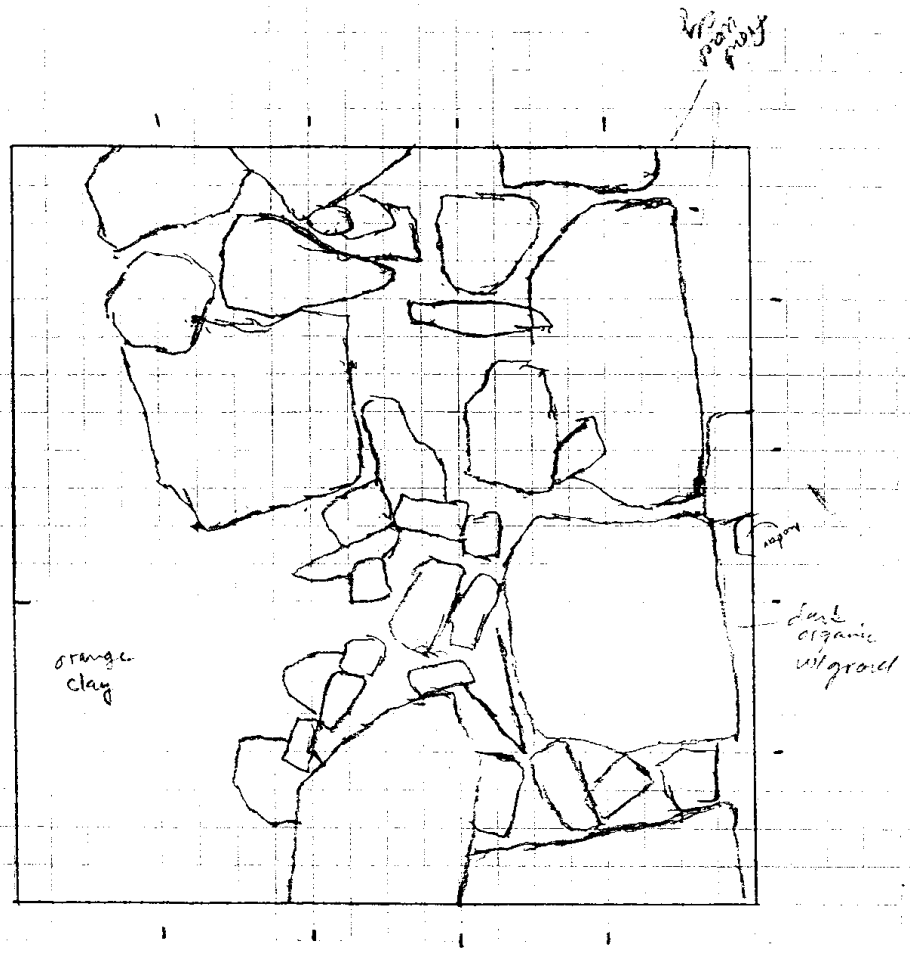
Eastern Excavations

Solid wire probing around the outside of the house yielded the presence of a large stone feature running along the eastern side of the house. As this feature was exactly eight feet from the northeastern corner of the house, we wondered what the nature of the feature was. It could not be determined from probing if this was a walkway or a retaining wall.

One, one-meter excavation unit was placed across this feature. Excavations indicated a broad (ca. 90 cm.) feature with the front (eastern) edge of the feature dressed (Figure 5). The upper portions of the feature had been robbed in the past and the eastern side infilled with dirt. The cultural material from the infill indicated a relatively recent (20th century) date for the infill. It was felt at this time that this feature might represent a support feature for a wraparound porch. However, the feature is oriented with the road and not with the house. There is a slight discrepancy in the angle of these two, with the road angling slightly to the southeast. As the southeastern corner of a possible wraparound porch would not fall on the stone feature, probing indicated a possible pier feature, but it has yet to be excavated.

Summary and Conclusions

In summary, the house appears to have extended to the west at least eight more feet. As the western wall trench was not physically located, it is impossible to determine yet how far to the west it was. Our best guess at this point is that the basement excavation is located 1.65 m. north of the south wall, and if we mirror this distance to the west, then the wall trench should be ca. 70 cm west of the eastern side of the store building. This falls within about one foot of the distance of mirroring the eastern interior room to the western room. The chimney located in the center of the western edge of the house is approximately 225 x 235 cm. and is thus within 15 cm in both dimensions of the other chimney in the house. As the eastern three feet of this dimension is the hearth, then the western four feet is chimney. This would place the projected intercept with




Amoureux House
Test Stone Feature
R#184
X=180
Level II
3 June '96

the west wall in approximately the center of the chimney. Again, as the western wall has not been located, this is only conjecture. The store building will need to be removed before we can adequately locate the western wall and to determine if there was a porch on the western side of the house as well.

There is currently no evidence for smaller porches on either the north or the south side of the house. The almost total lack of early period artifacts on the north side of the house, and the relative abundance of post-1875 materials would indicate not only that the 8-feet wide porch has always been present, but additionally that the north porch was enclosed in some fashion so that accumulations or artifacts could not occur. The greater abundance of early period artifacts under the 10 feet south porch would argue against its being enclosed. The presence of the undressed stone piers on the north side and dressed piers on the front would indicate that the existing orientation was the orientation at the time of the porches.

It has not yet been decided if porches were present on the east and west sides. On the west side, this will need to await demolition of the store building. On the east side, the northern pier may fall on the retaining wall. If there was a porch pier on the southeast corner has not yet been determined.

excavation

# Appendix I - Tree Ring Dating (Dendrochronology) Report

# TREE RING DATING OF FRENCH COLONIAL VERTICAL LOG HOUSES IN ST. GENEVIEVE, MISSOURI

by

Richard Guyette ~~and Osmund R. Overby~~

University of Missouri, Columbia, Missouri

## METHODS

Tree ring dating or dendrochronology was developed nearly 75 years ago in the American southwest by A. E. Douglass. He developled a method with which he could assign calendar year dates to the growth rings of wooden timbers of unknown age by comparing the patterns and features in the annual rings of trees. Douglass used the annual rings of many old living trees to make yearly records of past tree growth long enough to date timbers from peublo cliff dwellings. The annual growth rings of different trees in an area tend to have similar patterns since their growth is influenced by the common factor of climate. This is the crux of dendrochronology, that climate creates patterns in the annual rings of trees which can be compared and matched. The width of the annual ring and other climaticly induced features such as frost rings (rings with cambial damage from late spring frosts) can be compared between dated ring width series and those of undated timbers. Thus, tree rings of unknown age can be dated with precision to year of their growth-but only when their growth is sufficently infuenced by climate so as to create a distinctive sequential pattern.

Sampling

The historic houses of St. Genevieve presented some problems because of access, but the co-operation of the their owners was not one of them. Although many of the houses are lived in, on the National Register of Historic Places and a source of pride to both their owners and the community, we were afforded every courtesy (including iced lemonade and wild cherry wine) while drilling holes in their homes. Access to wall timbers was often difficult, however, because of layers of siding outside and plaster walls inside the houses which covered the vertical wall logs. This problem was overcome in many cases by owners who tore the horizontal strips of siding off their house walls to expose a small portion of many vertical logs for sampling.

Four species of trees comprised the majority of the wood sampled, white (leucobalanus) oak (Quercus spp.), red (erythrobalanus) oak (Quercus spp.), shortleaf pine (Pinus echinata) and eastern redcedar (Juniperus virginiana). White oak was the most common species sampled and used in the houses. Redcedar walls and posts were sampled in four houses. Other species of trees occasionaly used for timbers but not suitable for dendrochronology in St. Genevieve were willow (Salix spp.), black walnut (Juglans nigra), beech (Fagus grandfolia) and cottonwood (Populas deltoides).

Terminte damage to the sapwood of the timbers was the worst problem we encountered in sampling timbers. This type of damage was most prevalent in oak, seen occasionly in pine and not in redcedar. The sapwood in the oak timbers of many houses was over 95% powdered by termites from the basement timbers to the rafters.

In oak timbers, with an average of 20 sapwood rings, this presented a problem when attempting to date the time of felling of the tree to the year. This problem was overcome by taking a number of samples, testing the soundness of the wood before sampling and presistence. The outside ring of the tree or the trees last increment of growth before being felled was located on each timber (where present) in order to assign a date to its felling and to know where to sample the timber. Since most of the timbers were worked to some extent the last ring formed before the felling of the tree was not always present or obvious. It takes, however, only a small surface of the original outside of the tree to take a sample that will yield a felling date. The trees last year of growth was determined by the conformity of growth on the surface (both to the naked eye and under the microscope), the presence of bark and the absence of tyloses (cystlike structures) in the earlywood vessels of the last one or two growth rings in white oak. The conformity of the surface is seen under magnification as uninterupted tangential rows of cells.

Sampling was done with a 4.3 mm increment borer and a 12 mm increment drill. The increment borers were from 10 to 18 inches long and had shortened handles to allow turning at acute angles near wall timbers. The increment borer was used where the size of the hole was a problem (in someones living room) and because it was faster than a drill. Minor problems occured when the increment borer sometimes split the sample radially. This necessitated the realinment of the core and care in measurement. The drill was used in cramped areas and where the density of the wood made boring difficult. Samples were numbered and the location of the timber in the house was noted.

As many structual parts of a house were sampled as possible. Usually samples were taken from the wall logs, floor beams, sills, plates, trusses and rafters. This avoided problems of reused timbers, new roofs and provided informaton about room additions. Wall logs proved to be the most definitive in the dating of the houses because they were seldom replaced and had not had the sapwood removed. An attempt was made to get a least 20 samples per house. Samples were taken from the different kinds of wood in the houses. In large complex houses with probable additions more than 20 samples were taken. Lack of access to the timbers, termite damage, timber replacement and rotten timbers limited the samples which could be be taken from several of the houses. Samples were mounted, labeled and then surfaced with razor blades.

To summuarize, we took 375 samples from 24 houses in St. Genevieve County. Twenty of these houses were in the town of St. Genevieve. The majority of these were white oak, followed by redcedar and shortleaf pine.

Chronologies

In order to date the timbers from the houses of St. Genevieve ring width chronologies were needed which went back in time at least a hundered years (to approximately 1690) before the timbers in the houses were cut. This 100 year overlap was necessary in order to have a long enough ring sequence to obtain a definitive matching ring pattern. The chronologies needed to be constructed from species which had similar biological climatic responses to the species of tree being dated. Chronologies were also needed from sites where the year to year climatic variation was similar to that undergone by the trees from which the house timbers of St.

Genevieve came. This requirement was complicated by the probability that the timber for the houses of St. Genevieve was transported by river. Since is was much easier to transport logs by water (and St. Genevieve was founded by French "voyagers") than to drag them through the woods for miles it is difficult to say exactly where the logs came from. There are historical reports of loggers going more than a hunderd miles up river of St. Louis for cedar logs to use in the houses of St. Louis. In any case, the house timbers dated in this study may well have come from many kilometers up the Mississippi River or the Kaskaskia River in Illinois.

Fortunatly, this was not a problem because of the considerable number of tree ring chronolgies already completed b the author and others. There are 9 white oak and post oak chronologies within 150 km of St. Genevieve two of which are in St. Genevieve County. These chronologies cover almost every compass direction from St. Genevieve with the exception of the nrotheast. There are three eastern redcedar chronologies within 200 km of St. Genevieve which crossdate with each other. Two shortleaf pine chronolgies from less than 100 km in Illinois were used in dating. Of particular use in this reseach were the white oak chronologies from Ferne Clyffe, Illinois (Stockton et. al.); Giant City State Park, Illinois (Duvick and Blasing); Greasy Creek, St. Genevieve County (Duvick, Blasing and Guyette); and Babler State Park, Missouri, (Duvick and Blasing). Redcedar chronolgies of use where Jefferson County, Missoui (Bell, Magre and Senter); Boone County, Missouri (Guyette); Jack's Fork, Missouri (Guyette). Pine Chronologies used were Pine Hills, Illinois (Estes) and Piney Creek, Illinios (Estes). Several old

shortleaf pines from the St. Genevieve area were used in dating.

Some of the best crossdating was between chronologies derived from the houses themselves. After chronologies were derived and dated from the first sampled houses they were then very useful in crossdating other houses. House chronologies often provided the best tree ring cross matches with other houses. Figure 1 illustrates the crossdating between oak timbers in 4 St. genevieve houses. Most of the ring series from the houses dated spanned this period of time, between 1790 and 1690..

Crossdating

Crossdating is the matching of serial variations in the ring-widths and ring features of wood between trees in a climaticly homogeneous area. Crossdating works because climate is a common factor among trees in an area which limits and influences their growth. The matching or crossdating of ring patterns is a complex procedure-especilly in areas such a the mid-Mississippi valley where factors other than climate often dominate ring-width variablity. Several methods for crossdating have been developed based on human pattern matching abilities and statistical methods. Stokes and Smiley (1968) describe the traditional method of crossdating by skeleton plotting. This method, based on the intuitive matching of ring series and replication by trained individuals was developed in the southwestern United States. This method has several advantages. It is fast, can be done without expensive equipment, has stood the test of time and works well with trees in severly limiting climatic situations where false and missing rings are a problem and the year to year ring-width variation is large. Highly skilled individuals can crossdate the

much less variable rings of species often encountered in the eastern United States. Several European workers in the field have, however, found skeleton plotting inadaquate (Baillie 1982) when working with less variable ring series than those found in the American southwest. Micheal Baillie and other european workers have developed a crossdating method using visual matching of ring width plots with a statistical backup for use with oak. This method uses using correlation coefficents and a variation on the Student's t test to locate and estimate the probability of matching ring-width occuring by chance alone.

The following paragraphs outline the procedure used in crossdating the St. Genevieve material. It is a technique based on principles set down by Douglass, Baillie and others. It has been developed by the author over a period of some 7 years in working with tree rings in the state of Missouri. The crossdating technique used in this research utilized ring-width plots for pattern matching. These have been found useful because they contain all the ring width information in a growth radius of a tree's bole and do not require a judgement call for each ring as in skeleton plotting. Ring width plots are particularly useful when the ring width series do not contain large amounts of year to year variation making judgements difficult.

Ring-widths were measured with an electornic tree ring measuring device linked to a computerized data acquisition system. This enabled fast and accurate (to the .01 mm) measurement of the rings. Any distictive growth features such as frost rings, injuries, false rings or guestionable rings were entered into the computer along with the ring-width measurements. After the rings of the timbers in a house were measured the internal (within the

house) crossdating of the timbers in a house was begun. Ring-width plots were then made for all the most promising samples (i.e. those which had variable ring widths, intact outer growth rings and a sufficent number of rings) in a house. These plots, which usually numbered between 5 and 15 per house, were then compared on a light table by alining their most recent ring-width measurements (representing the last year of growth of the tree). This alinement is based on the assumption that most of the timbers in a house were cut in the same year, an assumption not valid in all cases. This assumption, however, has proven to be the case in St. Genevieve houses despite the fact that the town site was moved in the 1790's due to flooding. Based on this assumption a hypothesis testing situation can be used in comparing ring width series from timbers in the same house. The assumption allows the dating of ring series in which the climaticly induced ring width variation is weak making the dating of individual timbers with chronologies outside of those derived from the house difficult. Thus a group of house timbers which have ring-width variablilty in common but which individually have to little climaticly induced variablility for positive dating can be combined to produce a dateable series of ring widths. It is the serial ring-width variablitiy held in common between timbers in a house that indicates the timbers have a climatic signal (climaticly induced ring-width variation) which can be used in crossdating. The climatic signal present in the ring-widths of the timbers is improved by serially combining their ring-widths because individual differences in growth caused by non-climatic factors is averaged out.

Visual comparisons of this first group of ring-width plots

usually yeilded 5 to 10 sample plots which crossdated. These were then combined by graphically averaging the plots into a master chronology for the house. The residual samples from the house were then compared with this house master at all possible overlaps. The residual samples were then compared with each other as well as with chronologies from other houses and tree sites. Where there was crossdating between house timbers, plots were combined again to create a second master chronology. Note, it is important to examine the residaul samples left after the first comparisons are found because there is often more than one set of dates in a house or single, dateable, samples with relevent dates concerning timber reuse.

Visual comparisions of ring-width series were based on matching series with correlation coefficents of at least .4 for a 100 year period. Since yearly ring-widths are not statisticly independent in most of the St. Genevieve samples the sample size (number of years compared) needed to be adjusted to estimate the degrees of freedom. The degrees of freedom were calculated using the first order autocorrelation to estimate the independence of the series. For instance, a sample with 107 matching rings and an autocorrelation coeffient of .32 has approxamatly 55 degrees of freedom. A modified Student's t test was then used to test the significance of the correlation coeffient of two matching ring-width series. Thus, a 107 year ring-width series with a serial correlation coefficent of .56 and 55 degrees of freedom will occur less than a one in ten thousand times by chance. In practice this statistic was not run on every crossdating match but was used to estimate the amount of visual agreement needed between house timbers, test bordline cases and estimate the length of ring width

series neccesary for a significant match. It should be noted that statistics are only one facet of crossdating. Other ring features such as frost rings, latewood width and signiture years were often of equal importance. For instance, the frost rings of 1716, 1715 and to a lesser extent 1704 were very Helpful in dating oak, especially since they were the only ones in the 18th century-the time period used in the crossdating most of the houses. The 18th century climate around St. Genevieve also produced several distictive ring-width patterns or "signiture years". For example, the narrowest rings in many ring series were those of 1735 and 1736. No samples were dated which had wide rings in these years. For redcedar the period before and after 1784 was distictive with 1784 being nearly always narrow, 1783 being wide with alternating wide and narrow rings before. Several other ring width signitures are illustrated in Figure 1. Figure 1 shows the crossdating of timbers from 4 houses in St. Genevieve.

It should also be noted that there were several house in St. Genevieve that we could not date because of access problems and eratic or complacent ring-width series. Of the 24 houses we sampled there were only four from which we were not able to get any timber dates. In general we were able to date approxametly 50% of the samples we took from the houses and about 90% of the houses.

An independent verification of the dating of selected key samples was done by David Stahle at the University of Arkansas Tree Ring Laboratory using the Douglass method of crossdating. Key samples, that is, samples that were architectually and dendrochonologiclly important from 14 houses were sent. The dates which were verified by Stahle using the Douglass method of skelton

plotting are noted in the house date summaries.

There were several instances of tree ring date verification by historical documentation. The tree ring dating of the DeLasuss house was followed by historical documentation of the 1793 date from letters found in St. Louis by independent researchers ordering the house built before his arivial. The well documented Missouri State Historic Site, the Felix Valle House was sampled. Tree ring dates from pine and oak were found to be consistent with documentation of the building date, 1819. The Green Tree Inn, which proved to be the oldest house in St. Genevieve and probably the State of Missouri, dated at 1790, just what the sign in front of the house reads. It is also fair to state that there is documentation which does not confirm our tree ring dates. Confusing historical and often contradictory records were, in fact, one of the reasons we undertook this dating project.

## Acknowledgements

The authors wish to express their thanks to the people of St. Genevieve and the St. Genevieve Historic Foundation who encouraged and made possible this research. This study was funded by the University of Missouri Weldon Springs Research Fund.

## Footnotes

1. A. E. Douglass, Dating our prehistoric ruins. Natural History (1921), 21(1), pp. 27-30.

2. J. Francis, Personal communication.

3. E. DeWitt and M. Ames (eds.), Tree-Ring Chronologies Of Eastern North America (1978), Series IV, Vol. 1, Lab. of Tree-Ring Research, Univ. of Arizona, Tucson.

4. D. Duvick and T. J. Blasing, Oak Ridge National Lab. Oak Ridge Tennesse.

5. R. Guyette, Climatic Reconstruction From Redcedar and White Oak in the Ozarks (1981), Master's Thesis, Univ. of Missouri, Columbia, Mo.

6. M. Stokes and T. Smiley, An Introduction to Tree-Ring dating (1968), Univ. of Chicago Press, Chicago.

7. M. G. L. Baillie, Tree-Ring Dating and Archaeology (1982), Univ. of Chicago Press, Chicago.

8. The statistical hypothesis for this step is $H_0 : r=0$, $H_a : r=0$; respectively the null and alternative hypotheses where r is the correlation coeffient of two ring-width series.

The table summarizes the dateing of St. Genevieve houses. Dates which have been independently verified by David Stahle, University of Arkansas Ring Laboratory, are marked by an asterisk and a number representing the number of timbers dates verified. Dates followed by a plus sign have some rings missing. This is usuallu due to termite damage to the sapwood. After the plus sign is an estimate of the number of rings missing to the felling date. The mean number of rings for each group of sample cores is given along with the number of rings of the shortest core and longest core. The mean times the number of samples dated estimates the size of the dating base. Shortleaf pine is referred to simply as pine. Felling dates are thought to coinside with the initiation of a house's construction. In logs which lie on the ground for even short periods the sapwood deteriorates rapidly. The wood was easier to work when green and it would take many years for a log to dry out.

HOUSE DATING SUMMARY

| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1808 | floor beams | 2 | red oak | 86 (74-99) |

Old Academy

Most of the timbers in this stone structure were of cottonwood and not dateable. Tree dates confirm the building date engraved in stone on the front of building. Samples were from the southeast room and hallway.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1790 | wall logs | 2 | redcedar | 87 (83-91) |
| 1792 | wall logs | 3 | redcedar | ? |
| 1793 | wall log | 1 | redcedar | 73 |
| 1789+5 | truss collar | 1 | white oak | 127 |

Amoureaux House

A "poteaux en terre" house of redcedar. The 1792 dates best reflect the probable building date. Termite damage to the outer few rings of the truss collar caused felling date estimate.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1807 | wall logs | 11 | redcedar | 95 (60-138) |
| 1808 | floor beams | 4 | white oak | 90 (83-111) |
| 1808 | truss member | 1 | white oak | 111 |
| 1808 | window sill | 1 | white oak | ? |
| 1808 | floor beards | 4 | s. pine | ? |

Bequette-Ribault House

A "poteaux en terre" house of redcedar. This house was thoroughly sampled because of an expected earlier date, easy access during restoration and the cooperation of its owners. The

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1807 | floor beam | 2 | white oak | 156 (142-171) |
| 1803?? | wall log | 1 | white oak | 118 |
| 1806 | ceiling joist | 3 | s. pine | 136 (121-147) |

Pierre Dorlac??

Possible mineraliztion marks indicating water transport of timbers.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1806 | wall log | 1 | white oak | 130 |
| 1807 | wall logs | 5 | white oak | 112 (92-137) |
| 1810 | wall log | 1 | white oak | 108 |
| 1814 | wall logs | 4 | white oak | 94 (76-123) |

Durand House

House had two periods of construction one in 1807 and another in 1814. East room was built in 1807 and west room later in 1814.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1818 | ceiling joist | 2 | s. pine | 132 (124-140) |
| 1818+1? | floor beam | 1 | white woak | 71 |
| 1816 | ceiling joist | 1 | s. pine | 106 |

Felix Valle House

A two story stone house and Missouri State Historic site. The oak floor beam had an anomolis ring in 1811 which could be a double ring, thus the additional ring and question. The ring injury in 1811 was very unusual is coincident with the New Madrid earthquake.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1790 | ceiling beam | 1 | red oak | 78 |
| 1791 | wall logs | 4 | white oak | 82 (53-123) |
| 1792 | ceiling beam | 1 | red oak | 71 |

Francis Valle House

Ceiling timbers could have been placed in house after it was built and occupied. Red oak timbers, side by side compose the whole of the ceiling in this house.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1790 | floor beams | 4 | white oak | 109 (95-117) |
| 1791 | floor beam | 1 | white oak | 122 |
| 1808 | truss collar | 2 | pine | 144 (143-146) |

Green Tree Inn (Nicolas Janis house).

Large post on sill creole house. The 1791 date for the floor beam (6th floor beam from the north wall) indicates a possible lag in construction. The 1790 dates make this the oldest house we dated in St. Genevieve and possibly the oldest structure in the State of Missouri. The 1808 truss collar may have been added to the original roof or be part of a replacement roof. The young pine pole rafters of this structure had to few rings for a definitive date of the roof structure. The gallery posts of this house are of redcedar. Crossdating of the posts was unsuccessfull, possibly because of the ring-width variation introduced by the many fire scars formed during the life of the tree.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1806 | wall logs | 5 | white oak | 114 (77-139) |
| 1807 | truss collar | 1 | white oak | 135 |
| 1807 | floor beam | 2 | white oak | 141 (134-149) |
| 1807 | wall log | 1 | white oak | 84 |

Guibord-Valle house

A vertical log house on stone foundation constructed mostly of white oak.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1832 | wall stud | 1 | pine | 148 |
| 1832 | purlin support | 1 | pine | 135 |
| 1833 | floor beam | 1 | pine | 138 |
| 1834 | purlin support | 2 | pine | 115 (110-120) |
| 1834 | corner brace | 1 | pine | 152 |
| 1834 | floor beam | 1 | pine | 150 |

Joshoa Millard house

A large stone house with beautiful shortleaf pine woodwork. Wooden structure in the house is all shortleaf pine.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1830 | wall log | 1 | white oak | 101 |
| 1832 | wall log | 1 | white oak | 89 |
| 1833 | wall logs | 3 | white oak | 82 (72-92) |

Josheph Thomure

Only part of this vertical log house remians.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1830 | wall logs | 4 | white oak | 101 |
| 1832 | wall log | 1 | white oak | 89 |
| 1833 | wall logs | 3 | white oak | 99 (71-119) |

Jean Paul Roberts house

pine boards are possibly from one tree. The redcedar dated well with chronologies 230 km to northwest as well as with those closer.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1799 | floor beams | 3*(2) | red oak | 108 (103-114) |

Beauvais (II)

Floor beams proved the best bet for dating in this stone house although they had considerable termite damage. Norman truss and roof structure were of walnut, young pine and some oak without the last rings of growth.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1793 | wall logs | 4 | 2 red oak<br>2 white oak | 100 (99-116) |
| 1793 | sill brace | 1 | white oak | 106 |
| 1793 | plate brace | 1 | white oak | 136 |
| 1793 | corner post | 1 | white oak | 83 |
| 1793 | truss chord | 1 | white oak | 121 |
| 1792 | wall log | 1 | white oak | 115 |
| 1792 | truss chord | 1 | white oak | 110 |
| 1792+1 | top plate | 1 | white oak | 103 |
| 1786+5 | top plate | 1 | white oak | 99 |
| 1788 | wall log | 1 | white oak | 106 |
| 17?? | ceiling timber | 1 | white oak | ?? |

Bolduc House

Timbers from both sections of this house dated 1793 or 1792 despite their slighty different construction which suggests two buiding periods. The 1788 date for the wall log timber is the oldest timber dated in St. Genevieve. It is unusal in that it died 5 years earlier than most of the timbers, a spread of years not seen in most house walls. The ceiling of the south section of the house is composed solely of squared timbers with all the sapwood removed. The 17?? date indicates this ceiling was moved from the old town. The sapwood was probably removed because it was already powdered by termites. Ax marks and exposed termite tunnels indicate the sapwood was removed after the termite damage was done.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1801 | wall log | 1 | white oak | 215 |
| 1815 | wall log | 1 | white oak | 135 |
| 1816 | wall log | 2 | white oak | 101 (86-121) |
| 1817 | wall log | 1 | white oak | 114 |
| 1818 | wall log | 1 | white oak | 134 |

Charles LaHaye House

East side of house may have been built as early as 1801. The west side was built later. Pegs joining the log walls indicate two building periods.

A horizontal log house with all access to the wall logs covered. Dates from one corner of house where owner kindly tore off the siding.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RAUGE OF RING SERIES |
|---|---|---|---|---|
| 1785?? | floor beam | 1 | white oak | 55 |
| 1793 | floor beams | 2 | white oak | 135 (99-172) |
| 1793 | wall logs | 3 | white oak | 78 (61-108) |
| 1794 | floor beam | 1 | white oak | 61 |

DeLasuss house

Largest vertical log house we dated. Interior vertical log walls of cottonwood. Possible reused ceiling joists from old St. Genevieve in basement. Historical documentation ordering the house built found a posterori to house being tree ting dated.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1859+4 | wine press | 1 | white oak | 200 |

Kern wine Press

Wine press in the basement of the DeLasuss house was made from the bole of a large white oak. Ends of the press vat were crossections of the trees bole. These were sanded, photographed, and crossdated. Sapwood was present on corner of the vat and it appeared that very little sapwood was missing. Artical in 1865 local paper refers to press.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1794 | floor beams | 2 | white oak | 128 (101-156) |
| 1794 | floor beams | 2 | red oak | 95 (90-100) |

Jean Baptistie Valle house

Floor beams were the only exposed timbers in this post on sill vertical log house. Three of the dated timbers came from the main and largest room, the other timber date came from the wine cellar.

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| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RAUGE OF RING SE |
|---|---|---|---|---|
| 1785 | wall log | 1 | redcedar | 134 |
| 1789 | wall log | 1 | redcedar | 90 |
| 1792 | wall logs | 9 | redcedar | 74 (52-118) |
| 1799 | wall log | 1 | redcedar | 113 |
| 1800 | wall logs | 3 | redcedar | 101 (93-108) |
| 1801 | wall log | 1 | redcedar | 109 |

St. Gemme Vital Beauvais house

One of three post in the ground redcedar houses left in St. Genevieve. This house had two construction dates which are reflected in slightly different construction methods and different felling dates. The south half of this house was built first had the oldest dates and was probably built in 1792. The north half was built later around 1800. There is evidence of reuse of

timbers from the north wall of the original house in the addition. One timber from this section of the house dated 1792.

| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1872 | wall log | 1 | pine | 169 |
| 1873 | wall logs | 3 | pine | 107 (98-111) |
| 1873 | top plate | 1 | pine | 100 |

Winegarten house

This vertical log house on a sandstone foundation is near the town of Wingarten in St. Genevieve County. Is is unique in being made of shortleaf pine, a most suitable and available species in this region. In is the most recently built of the houses we dated and represents a continuation of the French building tradition.

| FELLING DATES | STRUCTUAL MEMBER | NUMBER OF DATES | SPECIES OF TREE | MEAN AND RANGE OF RING SERIES |
|---|---|---|---|---|
| 1819 | wall log | 2 | white oak | 134 (123-145) |

7th street house

This house is now dismanteled. It was a vertical log house on a stone foundation.

# Appendix J - Treatment Workshop Meeting Minutes

## BEAUVAIS-AMOUREUX HOUSE TREATMENT WORKSHOP

**IDIQ Contract No.:** 140P6020D0002 **Task Order No.:** 140P6020F0146
**Project:** Beauvais-Amoureux House Historic Structures Report
**RRJ Project No.:** 19203.1
**Date:** June 3, 2021 – 8:00 AM to 12:30 PM

| WORKSHOP ATTENDEES | | |
|---|---|---|
| **CONTACT** | **FIRM AND ROLE** | **EMAIL** |
| Lurita Blank | Raths, Raths, and Johnson, Inc. (RRJ)<br>Project Manager I Historical Architect | lmblank@rrj.com |
| Gloria Frank | RRJ \| Technical Staff | gafrank@rrj.com |
| Julie Cawby | BVH Architecture (BVH) \| Historical Architect | jcawby@bvh.com |
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| Dan Worth | BVH \| Historical Architect | dworth@bvh.com |
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| Liz Sargent | Liz Sargent HLA (LSHLA) \| Historical Landscape Architect | lizsargenthla@gmail.com |
| Jane Jacobs | LSHLA \| Historical Landscape Architect | janejacobshla@gmail.com |
| Melissa Dirr-Gengler | Historic Resources Group (HRG)\| Architectural Historian | melissa@hrg-nebraska.com |
| Bob Foust | Alvine Engineering \| Electrical | bfoust@alvine.com |
| Mike Gregory | Alvine Engineering \| Mechanical | mgregory@alvine.com |
| John Rosemurgy | NPS MWRO Cultural Resources \| COR/Historical Architect | john_rosemurgy@nps.gov |
| Joseph Vodicka | NPS MWRO Facilities, Planning, and Infrastructure \| Architect | joseph_vodicka@nps.gov |
| Christopher Collins | NPS Ste. Geneviève NHP \| Park Superintendent | christopher_collins@nps.gov |
| Anderson Newman-Johnson | NPS Ste. Geneviève NHP \| Park Maintenance | anderson_newman-johnson@nps.gov |
| Josh | NPS Ste. Genevieve NHP \| Park Maintenance | - |
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| Mark Buechel | NPS MWRO Cultural Resources \| Historical Architect | mark_buechel@nps.gov |
| Thom Kuntzman | Missouri SHPO \| Historical Architect | thom.kuntzman@dnr.mo.gov |
| Timothy Schilling | NPS Midwest Archeological Center \| Archeologist | tim_schilling@nps.gov |
| Robert Mueller | Foundation for the Restoration of Ste. Geneviève | muellerrj13@yahoo.com |
| Jesse Frances | St. Louis County Faust Historic Park\| Cultural Site Manager | jessewfrancis@aol.com |
| Jim Baker | Missouri DNR Felix Vallé House State Historic Site \|<br>Site Manager (retired) | jbaker363@att.net |

## WORKSHOP MEETING MINUTES

The Workshop was held on June 3, 2021, from 8:00 AM – 12:30 PM CST via Microsoft Teams. In attendance were representatives of NPS representing multiple departments and areas of technical expertise, NPS park staff, the consultant team for the Beauvais-Amoureux House (B-A House), Missouri SHPO, and select community stakeholders. The following meeting minutes are provided to summarize discussions and decisions made during this meeting for the project record. Should there be any questions or additions to these minutes, RRJ would appreciate the opportunity to update this document, as appropriate.

### A. Project Overview

1. Meeting attendees provided short introductions and are documented for the record in the table above. An overview of the workshop agenda, goals, and virtual meeting etiquette was given by Lurita Blank with RRJ.

2. Melissa Dirr-Gengler with HRG summarized the social history and changes over time as presented in 80% Historic Structure Report (HSR) and the Structural Assessment Report (SAR). Liz Sargent and Jane Jacobs of LSHLA summarized analysis of the historic landscape.

3. The working Period of Significance (POS) is stated to be 1792 – 1923, encompassing the ownership of both the Beauvais and Amoureux families and all major structural changes to the home. Further discussion on the POS and character-defining features was conducted later in the workshop agenda.

4. Discussion

    i. Multiple attendees asked questions regarding potential construction date of the galleries. Although materials for the galleries were purchased sometime around 1836 per estate inventory documents, the exact year of gallery construction is unknown and is estimated to have occurred between 1840-1852.

    ii. Jim Baker noted that a double-door is missing from the original (c.1792) B-A house model developed for the 80% HSR. He believes this door was located just west of the extant single doorway at the north gallery. The door's past presence is suggested by a header and log infill at the poteaux-en-terre construction at this location. This change was likely made when the interior hall was narrowed, and the interior reconfigured at an unknown date.

    iii. A 'road' located immediately south of the B-A house was discussed by the project team during the presentation. Liz Sargent with LSHLA discussed that this road appears on an 1825 plat map and an 1840s survey as "St. Gemme Street," but it is not clear if the road was ever paved or was simply a right-of-way.

        - Jim Baker pointed out that this road was used as the driveway providing access to the gift shop in the mid-late 20th century.

        - Melissa Dirr-Gengler with HRG added that "roads" are also mentioned in property descriptions to define the property boundaries. For example, the 1910 will of Felix Amoureux defines one of the property boundaries as Ste. Gemme Street or the alley to the south, which likely references the road or drive in question.

    iv. The project team hypothesizes that the original c. 1792 home had a thatch roof. Evidence for this hypothesis was requested. Lurita Blank with RRJ described that original strapping in the B-A House attic likely supported an original thatch roof and that there is not evidence that the extant straps ever had nails or pegs driven into them.

        - Historic documentation from the 1790s indicates thatch roofs were in sue in Ste. Genevieve, but typically for ancillary structures and outbuildings, not houses which were typically described as being shingled.

        - The questions regarding the B-A House's original roofing and the timeline for potential replacement with wood shingles remain open pending further historical documentation or physical evidence.

v. A question was raised regarding the unit system used in the site plans shown from the early 19th century. Discussion ensued with the conclusion that modern American units of

5. Action Items

i. BVH to review photos and documentation of the north gallery regarding the physical evidence for a double door at this location.

ii. Discussion of the 'road' immediately south of the home in the 80% HSR will be reviewed for clarity regarding a driveway versus a right-of-way.

iii. The project team is to form a recommendation for the spelling of the B-A house name, in particular the spelling of 'Beauvais,' for the final HSR.

iv. The project team may not have located information from previous investigations performed at the B-A House. RRJ will coordinate with NPS and the outside stakeholders regarding if additional information may be available for the team's review.

**B. Physical Investigation Overview**

1. The project team briefly summarized the findings of the recent physical investigation of the B-A House as discussed in the 80% HSR and SAR documents provided for this workshop. The following items were discussed:

i. Architectural features and interior finishes.

ii. Enclosure and structural systems.

iii. Site and landscape.

iv. Code, accessibility, and MEP systems

2. Questions and Discussion

i. The project team discussed that the information provided in the 80% HSR is based on the 2020 physical investigation and that no past investigations (other than HABS data) were reviewed by the project team.

ii. John Rosemurgy with NPS requested that all comments and questions related to these items be addressed to him via email by June 11, 2021. John provided attendees with a comment summary table.

3. Action Items

i. The project team requests access to review the results of any past investigations, especially any investigations related to the materiality or chronology of the building interior finishes, performed for the B-A House. RRJ will coordinate with NPS and the outside stakeholders on this item.

**C. Treatment Alternates**

1. Lurita Blank with RRJ and Julie Cawby with BVH provided an overview of the project goals.

    i. Treatment goals were discussed with the underlying understanding that foundational documents for the Ste Genevieve NHP are still underway.

    ii. Christopher Collins with NPS indicated that the park foundation documents are under development and are scheduled to be completed late in this calendar year.

    iii. Lurita Blank with RRJ further discussed the proposed POS dating from c. 1792 to 1923. Lurita described the POS as specific to the B-A House, supported by the importance of the two major family periods and to include the major alternations made under the Beauvais and Amoureux ownership.

    iv. The project team proposed a Rehabilitation approach with aspects of Preservation, Restoration, and Reconstruction as appropriate.

2. Landscape and accessibility recommendations were presented by Liz Sargent and Jane Jacobs of LSHLA.

    i. Three potential parking options were proposed by the project team. Christopher Collins with NPS described the current parking plans to be similar to Option 1 (parking at the Creole House to the southwest) with accessible parking at the parcel to the north of the B-A House.

    ii. Challenges regarding accessible access from St. Mary's Street were discussed due to the significant change in grade at the embankment and lack of dedicated parking on the road shoulder.

    iii. Opportunities to open the viewshed from the B-A House looking over the common field at east were discussed.

    iv. Potential locations for interpretive nodes for the site were presented.

    v. All recommendations were based on planned use of adjacent properties in the long-term interpretive plan for the B-A House.

    vi. Discussion

        - Tim Schilling with NPS recommended that the project team consider the language used for "un-evaluated" versus "undetermined" contributing features to align with Section 106 language.

3. Julie Cawby with BVH presented five architectural treatment concepts, which all included options for accessibility from the site to the building. All approaches included the accessible entrance on the west end of the structure.

    i. Concept 1 provided accessible access to the B-A House on the west side via a ramp and elevated deck. The deck is dimensioned to suggest the original footprint of the house before the original west elevation was demolished. Concept 1 retains

the north gallery as an enclosed space but reimagines the enclosure, potentially with glazing or another system to suggest an open gallery.

- Concept 1 was of interest the workshop attendees with recommendations for further consideration as discussed below to refine the preferred treatment approach.

- Reconfiguration of the ramp shown in Option 1 was discussed. The NPS team proposed that grading at the west end of the home be reconfigured to allow for elimination of the ramp switchback. A suggestion was made to place the ramp entirely within the 8'-10' footprint of the removed bay area at west.

ii. Concept 2 included reconstructing the missing west bay and constructing a new addition on the west elevation for a lift tower with massing to resemble the original masonry chimney. The north gallery would be restored to an open gallery. The NPS team expressed concerns with scaling for the lift tower as shown in Concept 2. Potential methods for minimizing the scale of the lift tower were discussed.

- Concept 2 was determined not to be the preferred approach and will not be developed further.

iii. Concept 3 proposed reconstruction of the missing west bay to provide interior space for mechanical and vertical circulation, including an accessible lift. In this concept, the north gallery would be reconstructed as an open gallery.

- Certain aspects of concept 3 were of interest the workshop attendees with recommendations for further consideration as discussed below to refine the preferred treatment approach.

iv. Concepts 4 and 5 proposed reconstruction of the missing west bay, extension of north and south galleries, and the addition of a r. Attendees expressed concerns with Concepts 4 and 5, regarding the inappropriate scaling. These options were presented in order to demonstrate the necessary massing for a potential lift tower and stair addition on the west side.

- Concepts 4 and 5 were determined not to be preferred approaches and will not be considered further.

v. Discussion:

- The NPS team expressed concern with providing a new deck at the west end of the home. The concern is that visitors may assume that the B-A home originally featured a deck or porch at this location.

- The NPS team requested for all concepts that additional options be provided for safety railing at galleries. A cable railing option was shown within all five options provided.

- The NPS team expressed a need for the project team to clearly defend the use of the west building end for building accessibility, and to clearly argue whether the west wall is a character-defining feature. Consensus was reached that the west wall is a contributing feature but not a character-

defining feature of the B-A house and appropriate for a rehabilitation treatment potentially to include the accessible entry.

- The NPS team requested that the project team consider additional concepts for infill of the north gallery. Setting the new enclosure behind posts at the north gallerie was suggested to highlight the gallery structure.

- Tim Schilling with NPS recommended that the project team consider and clarify the language used for “character-defining” versus “contributing” features to align with Section 106 language.

- An open discussion was held regarding the importance of visitors having physical access to the attic level, as is proposed in several of the architectural concepts. A general consensus was reached that alternate interpretive options will be explored for the attic framing and that direct visitor access is not the preferred approach.

- An open discussion was held regarding the general placement of the mechanical space at the northwest corner of the building, potentially within the footprint of the north gallery. Options and challenges for placing mechanical equipment within the attic and the cellar were discussed.

    a. Bob Mueller suggested that the project team research and consider an *appentis* (lean-to) structure if there is a desire to move the mechanical space outside the footprint of the B-A House.

4. Building enclosure recommendations were discussed by Lurita Blank with RRJ. The two major recommendations were the replacement of existing cedar shake roofing and cedar weatherboard siding, as these materials are not historic and are reaching the end of their service lives.

    i. Mark Buechel with NPS requested that the project team review and consider the use of roofing terminology, particularly ‘shake’ versus ‘shingle’ in the HSR document.

5. Three structural treatment concepts were presented by Lurita Blank with RRJ, including varying levels of alterations to existing historic structural fabric.

    i. Concept 1 proposed the least short-term intervention with stabilization and structural monitoring.

        - A consensus was made that this concept was not preferred as it did not provide a long-term solution for the house’s stability. Concept 1 will not be further developed.

    ii. Concept 2 proposed the partial in-kind replacement of vertical logs with other stabilization measures. Aspects of Concept 2 were of interest the workshop attendees, particularly that this concept preserves the poteaux-en-terre construction method. Recommendations were made by several attendees to the project team to consider whether alternate supports could be provided in addition to select log replacements.

iii. Concept 3 proposed to remove the failed vertical logs at grade and construct an alternate foundation system.

- A consensus was reached that Concept 3 is not the preferred approach since it removes the structural poteaux-en-terre system. This concept will not be further developed.

iv. Discussion

- Attendees expressed concern with Option 2, should all logs be cut at the same height this might not be desirable from a structural perspective and might unnecessarily remove serviceable log material. RRJ agrees and acknowledges the technical detailing of this approach is complex and requires detailed structural analysis.

- A question was raised about using GPR to determine extent of log deterioration below grade. RRJ responded that the low-tech data obtained during the physical assessment is believed to be reliable and that some deterioration is also visible to the naked eye. Further assessment of logs during the repair work is recommended and there may be valuable non-destructive methods that can be used at that time.

- Bob Mueller suggested that the project team consider options for introducing structural supports in the space between logs.

- Goals of the structural rehabilitation options were discussed.

- Laura Johnson with NPS mentioned that steel angles were installed under baseboards in 1994. The project team requested access to any information regarding this past rehabilitation project for further consideration.

- A question was raised whether a geotechnical soil investigation had been performed at the property. NPS did not believe that this had been performed.

6. Mick Gregory and Bob Foust with Alvine Engineering presented recommendations for HVAC, electrical, and fire suppression systems.

i. Part-way into the discussion, Christopher Collins with NPS needed to step away from the workshop, and the project team agreed that mechanical systems would be discussed further in a follow-up call with Chris to identify the preferred recommendation.

7. Discussion

i. Alvine recommended locating the equipment room at the west end of the north gallery, in approximately the same location as an existing bathroom. This is where the MEP services currently enter the building.

ii. Heating and cooling of the building was recommended. Options for use of electric versus natural gas heating were discussed. A general discussion was held regarding levels of heating and cooling to be provided, if tempering the interior was sufficient or if levels suitable for occupant comfort were desired. Christopher Collins

with NPS expressed a desire to meet occupant comfort levels, but potentially on an on-demand basis.

iii. Placement of MEP equipment in the attic was suggested. The project team discussed why this is not recommended including attic structural capacity, the need for the equipment to be within conditioned space, and the size of the equipment and the potential impact visitor experience or interpretation of the attic space.

iv. Placement of MEP equipment in an onsite shed was discussed. However, the B-A House has no existing shed onsite, and there is no documentation for ancillary structures on the property to provide guidance for integrating a new shed into the site.

v. Placement of MEP equipment below the north gallery was discussed. Bob Foust with Alvine expressed a potential concern with short-cycling air flow if this approach were implemented for the exterior condenser for an air conditioning unit. An option for a partially subgrade mechanical space was discussed but ultimately did not reach consensus as a preferred approach over locating the mechanical room in the northwest corner of the house.

vi. John Rosemurgy with NPS raised a question regarding the current water flow and pressure provided by the Ste Genevieve municipality and if it is sufficient for the proposed fire suppression system or if a fire pump would be required.

vii. Dan Worth with BVH and Lurita Blank with RRJ raised a question as to whether a geothermal system would eliminate the need for a condenser. Alvine responded affirmative, but that the cost for geothermal may outweigh the benefit.

viii. Alvine Engineering discussed the option of moving the electrical pole at the B-A House east elevation. This would also require moving fiber-optic cable.

ix. For fire suppression, Alvine recommended a dry pipe fire protection system in the cellar, main floor, and attic. Dry pipe systems are recommended for unconditioned spaces. The FP system can be fed from the mechanical room, and fire department connection would need to be located somewhere on the project site. Discussion was held regarding options for the fire suppression system, including a pre-action system or an early warning system; these systems are likely not needed but are options for consideration.

8. Consensus and Preferred Treatment Options

i. Landscape: Christopher Collins with NPS indicated a preference for the site access and parking locations presented in Option 1. This option is planned to be used this summer, and option 2 explored for potential ADA accessible parking.

- NPS requested that the project team further refine Option 1 to incorporate aspects of Option 2 for accessible parking.

ii. Architecture: Concept 1 was identified as the preferred treatment alternate, which provides an accessible ramp, deck, and entry at west. Of all options presented, this option entails the least amount of addition to the structure or alteration of the existing structure. The NPS team concluded that accessibility to the attic is not a

priority if modern technology can be used to provide visitor interaction with the space from the first floor.

- NPS requested that the project team further refine Concept 1 in an effort to minimize the footprint and bulk of the accessible ramp and deck and consider if minor grading changes can assist.

- There is a desire by NPS for this concept to involve a minimal impact to the log structure by using the west wall as rehabilitation zone for accessible entry.

iii. Structure: Concept 2, which involves replacement-in-kind of failed lower portions of the poteaux-en-terre logs, was identified as the preferred treatment alternate. Attendees preferred this option for its respect to the historic construction techniques, stability, protection of existing sound structural fabric, extension of the building's service life, and minimal visual impact to visitors. The team agreed that attempting to correct all building deflection was undesirable and a potential danger to the building's structure.

iv. MEP/FP: TBD following discussion with Park Superintendent.

9. Action Items

i. The project team will consider options for reducing the site impact of the accessible ramp on the west, options for a new enclosure system at the north porch, and options for safety railing systems.

ii. The project team will consider the recommendations for clarity on terminology and materials for various items as described above and make appropriate updates to the HSR document.

iii. The project team will coordinate with NPS and other stakeholders in an effort to track down other reports, studies, or information on repairs that may be available.

iv. The project team consider if a geotechnical soil investigation should be included in the recommendations for further investigation in the HSR.

v. Alvine Engineering to determine existing water flow and pressure from the local municipalities.

vi. Project team will further discuss MEP/FP options with Park Superintendent.

**D. Summary and Closing**

1. John Rosemurgy with NPS briefly reviewed the preferred treatment alternates with aspects for further consideration by the project team.

2. Lurita Blank with RRJ briefly reviewed the action items for the project team and thanked the workshop participants.

3. The workshop concluded at approximately 12:30 pm.

**Supporting Documents Enclosed**

1. Beauvais-Amoureux House Treatment Workshop Agenda
2. Beauvais-Amoureux House Pre-Workshop Treatment Approach Meeting Notes.
3. Beauvais-Amoureux House Post-Workshop HVAC Treatment Meeting Notes.

## BEAUVAIS-AMOUREUX HOUSE PRE-WORKSHOP TREATMENT MEETING

**IDIQ Contract No.:** 140P6020D0002 **Task Order No.:** 140P6020F0146
**Project:** Beauvais-Amoureux House Historic Structures Report
**RRJ Project No.:** 19203.1
**Date:** April 5, 2021 – 12:30 AM to 2:30 PM

| MEETING ATTENDEES | | |
|---|---|---|
| **FIRM AND ROLE** | **FIRM AND ROLE** | **EMAIL** |
| Lurita Blank | Raths, Raths, and Johnson, Inc. (RRJ)<br>Project Manager I Historical Architect | lmblank@rrj.com |
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| Liz Sargent | Liz Sargent HLA (LSHLA) \| Historical Landscape Architect | lizsargenthla@gmail.com |
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| Bob Foust | Alvine Engineering \| Electrical | bfoust@alvine.com |
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| John Rosemurgy | NPS MWRO Cultural Resources \| COR/Historical Architect | john_rosemurgy@nps.gov |
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| Mark Buechel | NPS MWRO Cultural Resources \| Historical Architect | mark_buechel@nps.gov |
| Timothy Schilling | NPS Midwest Archeological Center \| Archeologist | tim_schilling@nps.gov |

## MEETING MINUTES

A treatment meeting was conducted on April 5, 2021, from 12:30 – 2:30 PM CDT virtually via Microsoft Teams. In attendance, were representatives of the NPS and consultant team for the Beauvais-Amoureux House (B-A House) Structural Assessment and Historic Structure Report (HSR). The following meeting minutes are provided to summarize discussions and decisions made during this meeting for the project record. Should there be any questions or additions to these minutes, RRJ would appreciate the opportunity to update this document, as appropriate.

### A. Overview

1. Meeting attendees provided short introductions and are documented for the record in the table above. An overview of the meeting agenda and goals was given by Lurita Blank with RRJ.

2. Project Goals

   - Protect the historic resource.
   - Provide flexibility for future interpretive use.
   - Inform future planning for the site.

### B. Structural Stabilization Discussion

1. Vertical Logs: Lurita Blank with RRJ provided a summary of the condition of the vertical log walls of the B-A House. The character-defining *poteaux-en-terre* logs are heavily deteriorated below grade. The house is currently stable but there are concerns for the long-term serviceability of the logs.

- Lurita presented several conceptual treatments for structural remediation for the vertical logs, each with a different impact on the historic fabric and future occupancy / live load capacity. A general discussion was held regarding the potential treatment options and a consensus was reached that replacement in kind of the original members is the preferred approach.

    - Partial replacement-in-kind of the vertical logs entails replacing approximately the lower third of the original vertical logs and splicing at a level just above ground. Since only the lower portions of the logs are known to be heavily deteriorated, this option allows for extended service life of the logs, the preservation of the unique structural system, and will be nearly invisible. The downside of this method is that it is invasive and irreversible.

    - Other options within the umbrella of a replace-in-kind approach were brought to discussion:

        - The possibility of replacing entire logs was discussed. This approach would extend the service life of the walls but would come at the undesired cost of losing a large portion of the original fabric of the structure. Lurita Blank with RRJ indicated that the logs were not deteriorated along their entire length like likely could be replaced in their entirety.

        - Laura Johnson with NPS raised the possibility of only replacing select logs. This approach would aim to preserve the maximum the amount of original structural fabric. Lurita Blank with RRJ responded that this is a potential option but would require detailed structural analysis, potentially finite element analysis.

    - John Rosemurgy with NPS asked if placing newly replaced logs next to deteriorated existing logs would allow for spread of termites. Lurita Blank with RRJ advised this possibility will need to be considered with any replace-in-kind strategy. It was noted that the cedar logs are generally observed to have resisted termite damage for over two hundred years.

2. First-Floor Framing: Lurita Blank with RRJ provided a summary of the condition of the first-floor framing system. The historic floor system has failed in place. Currently, the existing shoring provides structural support for the first floor.

    - A general consensus was reach that is the preferred approach to preserve as much of the existing fabric as possible, even if the members are in a failed condition. Mark Buechel with NPS recommended that new minimally invasive supplemental members be introduced as required between the existing logs.

    - Lurita Blank with RRJ raised concerns about the existing shoring. A redesign of the existing shoring was suggested, with the end goal of providing supports that are more concealed than the existing shoring. It would be visually ideal to remove the diagonal supports to improve the visual experience.

    - Julie Cawby noted that the existing shoring is readily recognizable as a modern intervention, and this is generally the preferred approach where repairs cannot be concealed. Multiple parties agreed that timber or steel supplemental framing should be considered in a way that is clearly distinct from the original structure but less intrusive than the existing shoring.

- John Rosemurgy with NPS raised a question regarding ventilation in the caveau (cellar). Lurita Blank with RRJ responded that this is a concern due to the humidity in the caveau and introducing winter heating. It is unclear how effective the opening on the south wall is for ventilation. Options for providing ventilation in the caveau were discussed.

- Considerations for proposed heating and year-round accessibility were discussed. Julie Cawby with BVH recommended that the north porch would be a suitable location for a "Rehabilitation Zone" for mechanical entrances and equipment since it is not original to the structure and no historic fabric remains. Large heating/cooling systems would negatively impact the existing fabric of the structure and can be concealed in this Rehabilitation zone.

3. Norman Trusses: Lurita Blank with RRJ provided a summary of the condition of the attic trusses, ceiling beams, and top plate. At several locations, the trusses have been impacted by insect or water damage and require stabilization.

    - Lurita recommended localized repairs or stabilization with steel and tie rods. Partial or full replacement of timbers is possible but not believed to be necessary. It would be ideal to keep stabilization concealed in the attic so as not to impact first floor visitor experience.

        - Tim Schilling with NPS recommended that the project team consider the need for the stabilization repairs to be discrete. Options and case studies where steel framing was introduced to historic structures were discussed such as the Grant Home and Pullman National Monument, which was damaged by fire.

    - Laura Johnson with NPS asked for interpretive options or potentially exposing the attic framing and trusses. Due to concerns regarding occupancy and structural capacity of the attic, direct access by visitors will likely not be possible.

        - Mark Buechel with NPS suggested the possibility of viewing windows or openings into the attic space.

        - Lurita Blank with RRJ suggested considering digital methods such as virtual or augmented reality. Concerns were raised about maintaining a technology-based interpretive tool.

        - Julie Cawby with BVH suggested viewing periscopes as a low maintenance and effective method for visitors to see the concealed structure, potentially for both the attic and the cellar. Most attendees supported a non-digital and low maintenance solution.

**C. Site, Landscape, and Archaeology Discussion**

1. Liz Sargent with LSHLA provided an overview of the changes over time of the site and discussed the available historical agricultural census data and land ownership documents. Photographs of the structure are available for the past hundred years of the structure's life.

2. Per Tim Schilling with NPS an archaeological survey is in progress for this property. It is possible that evidence of foundations for privies, outdoor ovens, and other outbuildings may be found during the survey.

3. Tim Schilling with NPS asked if there was evidence the galleries ever wrapped the east or west end walls. Lurita Blank with RRJ responded that there is currently no evidence to support galleries on the east end based on the existing framing. Based on the physical evidence, there is nothing that suggests previous or different gallery structures from those extant.

4. Tim Schilling with NPS asked regarding evidence that the house was thatched when wood singles were in common use at the time. Lurita Blank with RRJ described the existing straps that are partially still in place on the primary rafters under the roof line of the galleries. These straps are attached to the rafters for forged nails and do not have holes consistent with nails or wood pegs as would have been required for wood shingles. There is no physical evidence that can confirm the original roofing, but the straps appear original to the c. 1792 structure and do not suggest that they supported wood shingles.

5. Tim Schilling with NPS asked as to why the house faces south when the structure lies along St. Mary's Road at the east. Lurita Blank with RRJ described that a road immediately south of the property is shown on the early surveys and plat maps, which may explain the house's orientation. Tim recommended that the project team consider which elevation may have been primary.

6. Liz Sargent with LSHLA asked NPS for any updates or additional information regarding plans to acquire properties adjacent to the B-A House. John Rosemurgy with NPS believed that at least two homes near the site have been closed on recently, including the Creole (Wilhauk) House to the southwest and the parcel immediately to the north. John said he will discuss the park boundaries and property acquisition plans with Christopher Collins, the park superintendent.

7. Tim Schilling with NPS described that LiDAR scans have been taken at the B-A House for the purpose of creating a 3-D model of the home. The LiDAR scan was limited to the immediate parcel of the B-A House and did not include adjacent properties. This information can be made available to the project after the data is compiled.

8. Julie Cawby with BVH requested that NPS provide a list of studies that have been done and others that are in progress for this site for the project team's reference.

**D. Accessibility Discussion**

1. Liz Sargent with LSHLA provided an overview of the features and challenges for accessibility on the B-A House site. Potential options for parking, comfort facilities for visitors, and accessible paths were discussed. These options are impacted by NPS's acquisition plans for adjacent parcels.

2. Per John Rosemurgy with NPS, NPS has determined that restrooms for visitors will not be provided within the B-A House.

3. Lurita Blank with RRJ asked if NPS owns the empty parcel immediately to the south of the B-A House. John Rosemurgy with NPS indicated he would ask Christopher Collins about this parcel.

**E. Context Discussion**

1. John Rosemurgy raised a question regarding the ownership of the land between St. Mary's Road and the Mississippi River, the former Common Field. Per Mark Buechel with NPS the former Common Field land is owned by multiple entities and encompasses Native American sites and floodplain lands.

2. Tim Schilling with NPS shared that the Army Corps of Engineers may be planning to purchase more of this land and will need to address archaeological concerns with further work on levees.

3. Liz Sargent with LSHLA discussed the impact of the Roth Boatyard on the viewshed of the Common Field from the B-A House.

4. Liz Sargent with LSHLA discussed potential interpretation of previous site features such as fences and stone walls. Recommendations for these features can be refined when the period of significance is established.

## F. Period of Significance (POS) Discussion

1. The project team has proposed a POS for the B-A House spanning c. 1792 to 1923. This period encompasses the ownership of both the Beauvais and Amoureux families and the major structural alterations made to the home during this time. The structure as it exists today remains largely unaltered since c. 1900, with the exception of the enclosure of the north gallery during the 1960s restoration.

    - Tim Schilling with NPS indicated that he would recommend a narrower POS of approximately 1750-1860 focused on the period of French Heritage. He suggested this would better align with Ste. Genevieve NHP's enabling legislation and the archeological resources.

    - Tim Schilling with NPS asked if 1890 was considered as a potential end date for the POS. Pelagie Vital, wife of Benjamin Amoureux, died that year. Lurita Blank with RRJ responded that ending the POS at this date would encompass the last major alterative of the house but would abbreviate the portion of the building's history when it was owned by the Amoureux family in a way that would be difficult to defend.

    - The 2016 Special Resource Study for Ste. Genevieve ended the POS in 1850.

    - The B-A House HSR team will carefully consider the POS for which recommendations will be made for all aspects of the property.

## G. HVAC/MEP Discussion

1. Bob Foust with Alvine provided a summary of the options for introducing new mechanical systems to the building. Potential options include a traditional furnace/condensing unit system, a mini-split system, or a geothermal heat pump system.

2. Christopher Collins, park superintendent, has previously indicated that year-round use of the house is desired. Due to extreme seasonal temperatures in Missouri, air conditioning in the summer and modest heating in the winter will be necessary.

3. Lurita Blank raised concerns about creating microclimates within the exterior walls and for condensation potential in the attic. Mark Buechel asked about options to add insulation and a vapor retarder to the envelope. Laura Johnson with NPS also asked about the need for humidity control.

    - Tim Schilling with NPS recommended that NPS standards for housing exhibit materials be consulted for determining interior environmental conditions.

    - Bob Foust with Alvine suggested that an electrical furnace would introduce less moisture than a gas or propane-fueled system.

4. An open discussion on potential location of mechanical equipment was held. The west end of the north gallery (the existing lavatory) has been identified as a potential location for a new mechanical room. Bob Foust with Alvine proposed running HVAC ductwork from this space into the attic.

    - Laura Johnson with NPS suggested that the HVAC equipment visibility be considered and coordinated with potential interpretive viewing options for the attic.

    - John Rosemurgy with NPS asked about the ability to effectively heat the first floor. Bob Foust with Alvine suggested that providing insulation at the attic level would be beneficial for any heating system. The possibility of installing high r-value insulation at the attic floor was suggested. Mark Buechel with NPS suggested the project team carefully consider the insulation type to minimize visual impact.

    - Julie Cawby with BVH considered a concept to insulate the roof instead of the attic floor. Laura Johnson with NPS recommended to keep the roof as authentic as possible and that the undersides of the shingles should be visible from the attic. Laura recommended that the advantages and disadvantages of the various approaches be considered.

**H. Summary and Next Steps**

1. Lurita Blank with RRJ provided a summary of the preferred treatment approach for the structural systems as follows:

    - Vertical Logs: Replacement in kind and further study regarding the extents of replacement.

    - First-Floor Framing: Preserve existing failed members and introduce supplementary supports in a minimally invasive manner, potentially with re-design of shoring system.

    - Norman Trusses: Localized stabilization with consideration of the visual impact of repairs.

2. Action Items

    - The project team will consider open items suggested and discussed by attendees described above in further development of the 80% HSR document.

    - RRJ will coordinate with NPS to compile a list of studies in progress for the HSR team's consideration, including a list of adjacent parcels acquired by NPS.

    - The project team will further consider the proposed POS and review the information referenced by workshop attendees.

## BEAUVAIS-AMOUREUX HOUSE POST-WORKSHOP HVAC MEETING

**IDIQ Contract No.:** 140P6020D0002 **Task Order No.:** 140P6020F0146
**Project:** Beauvais-Amoureux House Historic Structures Report
**RRJ Project No.:** 19203.1
**Date:** June 3, 2021 – 8:00 AM to 12:30 PM

| MEETING ATTENDEES | | |
|---|---|---|
| **CONTACT** | **FIRM AND ROLE** | **EMAIL** |
| Lurita Blank | Raths, Raths, and Johnson, Inc. (RRJ)<br>Project Manager I Historical Architect | lmblank@rrj.com |
| Julie Cawby | BVH Architecture (BVH) \| Historical Architect | jcawby@bvh.com |
| Mike Gregory | Alvine Engineering \| Mechanical | mgregory@alvine.com |
| John Rosemurgy | NPS MWRO Cultural Resources \| COR/Historical Architect | john_rosemurgy@nps.gov |
| Christopher Collins | NPS Ste. Geneviève NHP \| Park Superintendent | christopher_collins@nps.gov |

## MEETING MINUTES

This post-workshop meeting was held on June 4, 2021, from 10:00 AM – 10:30 AM CST via Microsoft Teams. The following meeting minutes are provided to summarize discussions and decisions made during this meeting for the project record. Should there be any questions or additions to these minutes, RRJ would appreciate the opportunity to update this document, as appropriate.

### A. Heating Discussion

1. Mike Gregory with Alvine Engineering (Alvine) summarized the recommendations heating included in the 80% Historic Structure Report (HSR) document. The conceptual heating treatment included interior tempering (maintaining interior temperatures above freezing through mechanical heating) and a possibility for on-demand heating to occupant comfort levels (about 68 degrees F).

2. An open discussion with Christopher Collins with NPS was held regarding occupancy needs in heating months and occupant comfort expectations. Chris agreed with the tempering concept during off-hours and expressed a need for heating to occupant comfort levels, potentially on an on-demand basis.

3. Mike Gregory with Alvine explained that the heating concept could be executed with either a natural gas or electric furnace.

### B. Cooling Discussion

1. An open discussion with Christopher Collins with NPS was held regarding occupancy needs in cooling months and occupant comfort expectations. Chris expressed a need for integrated cooling (air conditioning) and the ability to control the house environmental systems with temperature programming.

2. Mike Gregory stated that air conditioning can be easily integrated into the proposed heating and ventilation system. The equipment for both heating and cooling would need to be sized to accommodate the “leaky envelope” of the house. An exterior condensing unit would be required for a traditional air conditioning system.

3. An open discussion was held regarding air infiltration and condensation potential in the house with the introduction of heating and cooling.

    i. Julie Cawby with BVH raised concerns about ventilation in the attic. Lurita Blank with RRJ concurred and recommended that ventilation be carefully considered in the roofing replacement project.

    ii. Lurita Blank with RRJ raised concerns that the existing ceiling will allow condition air, particularly in the winter, to infiltrate uncontrolled into the attic, which raises condensation potential. Lurita recommended further consideration of introducing an air barrier and potentially limited insulation at the attic floor.

    iii. Lurita Blank with RRJ and Mike Gregory discussed the lack of vapor control in the exterior wall system. Ste. Genevieve is a mixed climate, which impacts the proper location of a vapor retarder in the wall system. Lurita recommended that RRJ perform some hygrothermal analysis using WUFI to better understand condensation potential and the impact of a vapor retarder.

    iv. Mike Gregory with Alvine recommended considering air sealing measures to reduce air infiltration through doors and windows. John Rosemurgy with NPS agreed but cautioned that the visual impact of weather sealing would need to be carefully considered.

    v. Christopher Collins with NPS asked the project team to recommend data loggers for temperature and relative humidity and placement to better understand the current interior conditions.

**C. North Porch Enclosure Discussion**

1. John Rosemurgy with NPS revisited options for an open versus and enclosed north gallery. Julie Cawby with BVH replied that this is somewhat dependent on the interpretive plan for the house but that architectural concepts for an open gallery could be considered.

2. An open discussion was held on the location of the proposed mechanical room at the west end of the north gallery and other potential options such as within the footprint of the original house or as an addition to the west end. Per Julie Cawby with BVH, since the north gallery is not historic fabric, it was identified as a potential rehabilitation zone suitable for a new mechanical room. The discussion concluded with the proposed location for the new mechanical room to be the west end of the north gallery.

**D. Preferred Treatment Options**

1. **Heating:** Interior tempering with on-demand heating to occupant comfort capabilities.

2. **Cooling:** Air conditioning capabilities will be incorporated into the HVAC.

3. **Fire Suppression:** Dry-pipe system.

**E. Action Items**

1. The project team will include air conditioning treatment options in the 95% HSR document.

2. RRJ, BVH, and Alvine will explore options for introducing and air barrier and potentially insulation to the attic floor and will consider the impact to the historic fabric and aesthetics of the attic space.

3. RRJ will perform some hygrothermal analysis using WUFI in an attempt to better understand the condensation potential and the impact of a vapor retarder in the exterior walls.

4. RRJ will follow up with NPS regarding temperature and relative humidity data loggers for monitoring the existing conditions at the house.

# Appendix K - Treatment Cost Estimate

# Bauvais Amoureux House Renovation

## Schematic Design Estimate

Submitted to:

Raths, Raths & Johnson, INC

Willowbrook, IL 60527

Revision 2

9/27/2021 Rev 2

CCS Project # 20.188

CCS™

WE TAKE ON YOUR VALUES.

1815 South Meyers Road
Suite 200
Oakbrook Terrace, IL 60181

630.678.0808
www.CCSdifference.com

## BASIS OF ESTIMATE

# Class C Construction Cost Estimate Template

National Park Service (NPS) - Denver Service Center (DSC) | 5-27-21

*By using this Construction Cost Estimate template, you acknowledge you read and understand the corresponding Instr*

### PROJECT INFORMATION

| | |
|---|---|
| **Project:** | **Bauvais Amoureux House Repair** |
| **Park:** | **Ste. Geneviève National Historical Park** |
| **Park Alpha:** | **STGE** |
| **PMIS Number:** | **311235** |
| **Estimate Date:** | **9/27/2021 Rev 2** |
| **Prepared By:** | **Jim Burke** |
| **Company:** | **CCS** |
| **Address:** | **1815 S Meyers Rd, Suite 1070** |
| **City, State Zip:** | **Oak Brook Terrace, IL 60181** |
| **Phone:** | **630-678-0855** |

### BACKGROUND SUPPORTING MATERIAL (Scope of Work):

Estimate is based on the preferred treatment alternate presented in the historic structure report. These treatments were developed based on meetings with NPS, periodic review and stakeholder feedback of HSR documents, and a participatory workshop held on June 3, 2021.

### SOURCE OF COST DATA:

Majority of cost are based on RS Means 2020 Residential New Construction Cost Data.

### ESTIMATE ASSUMPTIONS:

This estimate assumes a normal market condition.

This estimate assumes five or more qualified Contractors competitively bidding on this project with project being awarded to one General Contractor

The estimate reflects a start date March 2024 with a 12 month construction schedule.

This Estimate excludes:

1. Professional fees, testing, moving expense, all owner and total project soft costs as listed on detailed estimate section.
2. Furnishings and equipment other than those shown in the body of the estimate.
3. Premium costs for work done in out of hours, or in phases
4. Construction Contingencies,
5. Building Permits,
6. Builder's Risk Insurance.

This estimate is based on information available at this time. The scope of this estimate should be reviewed to insure our interpretation of the drawings and other information is correct. This estimate should be updated as the design evolves and is completed.

This cost estimate represents our opinion of probable construction cost for this project. We have exercised due professional diligence in the preparation of this estimate. Since we have no control over final material selection, bidding strategies and market conditions, no guarantee is given or implied with this estimate.

CCS performed this estimate using information we have of the current market conditions. COVID 19 is causing the world to change and the effect on the construction market is very fluid and might have further implications on construction costs that could occur moving forward. Costs for this project should be reviewed relative to local market conditions when it is closer to the time the project is going out to bid to ensure significant changes have not occurred as a result.

## BASIS OF ESTIMATE

# Class C Construction Cost Estimate Template

National Park Service (NPS) - Denver Service Center (DSC) | 5-27-21

*By using this Construction Cost Estimate template, you acknowledge you read and understand the corresponding Instr*

### PROJECT INFORMATION

| | |
|---|---|
| **Project:** | **Bauvais Amoureux House Repair** |
| **Park:** | **Ste. Geneviève National Historical Park** |
| **Park Alpha:** | **STGE** |
| **PMIS Number:** | **311235** |
| **Estimate Date:** | **9/27/2021 Rev 2** |

### MAJOR CHANGES FROM PREVIOUS ESTIMATE:

Revisions to the estimate include increases to Mark-Up & Add-On Factors, refined quantities for work items, and inclusion of allowances and contingencies.

### DESCRIPTION OF MARK-UP & ADD-ONS:

| | | |
|---|---|---|
| Location Factor: | 7.00% | Closest RS Means market Center is St Louis, MO CCI= 100.6 |
| Remoteness Factor: | 10.00% | Site is 63 miles from published commercial center. Highway access to site. |
| Wage Rate Factor: | 0.00% | NA- Work Priced up based on Location |
| State & Local Taxes: | 9.225% | State Sales Tax plus County - Based on Missouri |
| Design Contingency: | 25.00% | Preliminary Design (PD) documents are available but treatments are highly conceptual. A complex scope requiring specialty trades that is not completely defined and with conditions that have not been verified warrants a 25% design contingency. |
| Standard. General Conditions: | 15.00% | |
| Government General Conditions: | 5.00% | |
| Historic Preservation Factor: | 20.00% | Project is a historical building |
| Contractor Overhead: | 15.00% | Normal mid-range for Small to medium sized contractor in this area |
| Contractor Profit: | 12.00% | Normal mid-range for Small to medium sized contractor in this area |
| Bonds and Permits: | 2.50% | Standard range for established contractors |
| Contracting Method Adjustment: | 5.00% | Local Contractors |
| Annual Inflation Escalation Factor: | 4.05% | Based on 4.05% a year |
| Time Until Project Midpoint (Months) | 36 | Number of months from estimate (or data) date until the projects midpoint of construction. |

### OTHER COMMENTS:

NA

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

# PROJECT COST SUMMARY

**Project:** Bauvais Amoureux House Repair
**Park:** Ste. Geneviève National Historical Park
**Alpha:** STGE
**PMIS:** 311235

**Estimate By:** Jim Burke
**Date:** 9/27/2021 Rev 2

**Reviewed By:** Reviewer
**Date:** Review Date

| Item No. | Description | Quantity | Unit | Cost/Unit | Total |
|---|---|---|---|---|---|
| 1 | Not Used | 1 | LS | $0 | $0 |
| 2 | Exterior Closure | 1 | LS | $190,756 | $190,756 |
| 3 | Other Misc Repairs | 1 | LS | $16,135 | $16,135 |
| 4 | Site Improvements | 1 | LS | $12,325 | $12,325 |
| 5 | Structural Repairs - Foundation | 1 | LS | $351,973 | $351,973 |
| 6 | Structural Repairs - Floor Construction | 1 | LS | $112,964 | $112,964 |
| 7 | Not Used | 1 | LS | $0 | $0 |
| 8 | Interior Improvements | 1 | LS | $83,723 | $83,723 |
| 9 | Plumbing | 1 | LS | $363 | $363 |
| 10 | Mechanical | 1 | LS | $74,813 | $74,813 |
| 11 | Fire Protection | 1 | LS | $88,610 | $88,610 |
| 12 | Electrical | 1 | LS | $43,100 | $43,100 |
| 13 | Site Utlitiy Work | 1 | LS | $23,664 | $23,664 |
| 14 | Not Used | 1 | LS | $0 | $0 |
| 15 | Not Used | 1 | LS | $0 | $0 |
| 16 | Not Used | 1 | LS | $0 | $0 |
| 17 | Not Used | 1 | LS | $0 | $0 |
| 18 | Not Used | 1 | LS | $0 | $0 |
| | | | | | |
| | **Subtotal Direct Construction Costs** | | | | **$998,426** |
| | **Value of Government Furnished Property (GFP) Included in Direct Cost (see footnote)*** | | | | **$0** |
| | | | | **Direct Cost Subtotal without GFP** | **$998,426** |
| | **Published Location Factor** | 7.00% | | | $69,890 |
| | **Remoteness Factor** | 10.00% | | | $99,843 |
| | **Federal Wage Rate Factor** | 0.00% | | | $0 |
| | **State & Local Taxes** | 9.23% | | | $21,962 |
| | **Design Contingency** | 15.00% | | | $149,764 |
| | **Total Direct Construction Costs** | | | | **$1,339,885** |
| | **Standard General Conditions** | 15.00% | | | $200,983 |
| | **Government General Conditions** | 5.00% | | | $66,994 |
| | **Historic Preservation Factor** | 20.00% | | | $267,977 |
| | **Subtotal NET Construction Cost** | | | | **$1,875,838** |
| | **Overhead** | 15.00% | | | $281,376 |
| | **Profit** | 12.00% | | | $225,101 |
| | **Estimated NET Construction Cost** | | | | **$2,382,315** |
| | **Bonds & Permits** | 2.50% | | | **$59,558** |
| | **Contracting Method Adjustment** | 5.00% | | | $119,116 |
| | **Inflation Escalation** | 36 | Months | 4.05% | $323,932 |
| | **Total Estimated NET Cost of Construction** | | | | **$2,884,920** |

* GFP costs are only used when the Government pre-purchases items, or provides other materials out of Government inventory, to be installed by contractor. Adjustments and Markup on GFP only include Inflation Escalation; No other adjustment factors or O&P markup have been applied.

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item 2** | **Exterior Closure** | **Total Cost:** | Total Cost |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **B20** | | **EXTERIOR CLOSURE** | | | | | Existing Siding Replacement |
| B2010 | L,E | Cedar siding replacement, western red cedar, 5" exposure, grade A or Better (heartwood), cut nails for exposed fasteners, backprimed | 1105 | SF | $ 2.45 | $ 2,707.25 | |
| B2010 | M | Cedar siding replacement, western red cedar, 5" exposure, grade A or Better (heartwood), cut nails for exposed fasteners, backprimed | 1105 | SF | $ 11.05 | $ 12,210.25 | |
| B2010 | L,E | 3-Coat Limewash to Cedar Siding & Trims | 1500 | SF | $ 3.00 | $ 4,500.00 | |
| B2010 | M | 3-Coat Limewash to Cedar Siding & Trims | 1500 | SF | $ 2.25 | $ 3,375.00 | |
| B2010 | L,E | Cedar trim boards - 1"x 4" - backedprimed | 146 | LF | $ 1.74 | $ 254.04 | |
| B2010 | M | Cedar trim boards - 1"x 4" - backedprimed | 146 | LF | $ 6.26 | $ 913.96 | |
| B2010 | L,E | Cedar trim boards - 1" x 8" - backprimmed | 22 | LF | $ 2.30 | $ 50.60 | |
| B2010 | M | Cedar trim boards - 1" x 8" - backprimmed | 22 | LF | $ 8.70 | $ 191.40 | |
| B2010 | L,E | Cedar Rake trim boards - 1" x 8" - backprimed | 118 | LF | $ 2.30 | $ 271.40 | |
| B2010 | M | Cedar Rake trim boards - 1" x 8" - backprimed | 118 | LF | $ 8.70 | $ 1,026.60 | |
| B2010 | L,E | Cedar trim boards - 1" x 12" - Cut out Tail ends | 51 | LF | $ 7.50 | $ 382.50 | |
| B2010 | M | Cedar trim boards - 1" x 12" - Cut out Tail ends | 51 | LF | $ 17.50 | $ 892.50 | |
| B2010 | L,E | #15 asphalt felt underlayment | 1105 | SF | $ 0.78 | $ 861.90 | |
| B2010 | M | #15 asphalt felt underlayment | 1105 | SF | $ 0.97 | $ 1,071.85 | |
| B2010 | L,E | Lead coated drip caps for window and door heads | 28 | LF | $ 8.50 | $ 238.00 | |
| B2010 | M | Lead coated drip caps for window and door heads | 28 | LF | $ 6.00 | $ 168.00 | |
| B2010 | L,E | 4x4x14'H Hand Hewn Posts @ Porch | 20 | EA | $ 100.00 | $ 2,000.00 | Partial porch |
| B2010 | M | 4x4x14'H Hand Hewn Posts @ Porch - Allow | 20 | EA | $ 250.00 | $ 5,000.00 | reconstruction for access |
| B2010 | L,E | 4x4x14'H Hand Hewn Beams @ Porch- Mortised | 306 | LF | $ 7.50 | $ 2,295.00 | for structural repairs |
| B2010 | M | 4x4x14'H Hand Hewn Beams @ Porch- Mortised | 306 | LF | $ 18.00 | $ 5,508.00 | |
| B2010 | L,E | 2X Cedar Railings | 145 | LF | $ 4.00 | $ 580.00 | |
| B2010 | M | 2X Cedar Railings | 145 | LF | $ 4.78 | $ 693.10 | |
| B2010 | L,E | 3-Coat Lime Exterior Plaster With Limewash under porch | 288 | SF | $ 35.20 | $ 10,137.60 | Refinishing logs after |
| B2010 | M | 3-Coat Lime Exterior Plaster With Limewash under porch | 288 | SF | $ 4.80 | $ 1,382.40 | structural repairs |
| B2010 | L,E | Clay Parge Coating to vertical logs in caveau | 1300 | SF | $ 15.00 | $ 19,500.00 | |
| B2010 | M | Clay Parge Coating to vertical logs in caveau | 1300 | SF | $ 4.00 | $ 5,200.00 | |
| B2010 | L,E | Repair Existing Doors & Screen Doors - Allowance | 5 | EA | $ 500.00 | $ 2,500.00 | Door and window |
| B2010 | L,E | 3' x7' Wood Doors and Frame with Hardware | 1 | EA | $ 400.00 | $ 400.00 | replacement or restoration |
| B2010 | M | 3' x7' Wood Doors and Frame with Hardware | 1 | EA | $ 2,200.00 | $ 2,200.00 | |
| B2010 | L,E | 3'x 4'-5" Custom casement with frame, trim & hardware | 1 | EA | $ 175.00 | $ 175.00 | |
| B2010 | M | 3'x 4'-5" Custom casement with frame, trim & hardware | 1 | EA | $ 900.00 | $ 900.00 | |
| B2010 | L,E | 3'x 5' Custom casement with frame, trim & hardware | 8 | EA | $ 175.00 | $ 1,400.00 | |
| B2010 | M | 3'x 5' Custom casement with frame, trim & hardware | 8 | EA | $ 1,000.00 | $ 8,000.00 | |
| B2010 | L,E | Curtain Walls System | 675 | SF | $ 19.00 | $ 12,825.00 | Interpretive enclosure for |
| B2010 | M | Curtain Walls System | 675 | SF | $ 96.00 | $ 64,800.00 | north porch |
| B2010 | L,E | 36" H Tempered Glass Set in Cedar Frame | 225 | SF | $ 26.38 | $ 5,935.50 | Railings for south porch |
| B2010 | M | 36" H Tempered Glass Set in Cedar Frame | 225 | SF | $ 19.77 | $ 4,448.25 | |
| B2010 | L,E | Install 1/8" x 1/8" Galv. Hardware Cloth over new Opening for Ventilation | 1 | EA | $ 60.00 | $ 60.00 | Caveau ventilation improvements |
| B2010 | M | Install 1/8" x 1/8" Galv. Hardware Cloth over new Opening for Ventilation | 1 | EA | $ 15.00 | $ 15.00 | |
| | | | 0 | | $ - | $0 | |
| | | **SUBTOTAL EXTERIOR CLOSURE** | **1** | **LS** | **$ 185,070.10** | **$185,070** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **F20** | | **SELECTIVE BUILDING DEMOLITION** | | | | | |
| F2010 | L,E | Remove Existing Siding & Trims | 1105 | SF | $ 2.25 | $ 2,486.25 | |
| F2010 | L,E | Demo for New Door Opening & Prep for New Door | 1 | EA | $ 600.00 | $ 600.00 | |
| F2010 | L,E | Demo 4SF of Brick for Ventilation & add support | 1 | EA | $ 350.00 | $ 350.00 | |
| F2010 | L,E | Demo Existing windows | 9 | EA | $ 250.00 | $ 2,250.00 | |
| | | | 0 | | $ - | $ - | |
| | | | 0 | | $ - | $ - | |
| | | | 0 | | $ - | $ - | |
| | | | 0 | | $ - | $ - | |
| | | **SUBTOTAL SELECTIVE BUILDING DEMOLITION** | **1** | **LS** | **$ 5,686.25** | **$5,686** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Exterior Closure** | **1** | **LS** | **$ 190,756.35** | **$190,756** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item** | **Other Misc Repairs** | **Total Cost:** | $16,135 |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **B20** | | **EXTERIOR CLOSURE** | | | | | |
| B2010 | L,M | Re-pointing rubble stone foundation wall, lime putty mortar | 200 | SF | $ 30.00 | $6,000 | Misc repairs to exterior walls |
| | M | Re-pointing rubble stone foundation wall, lime putty mortar | 200 | SF | $ 5.00 | $1,000 | |
| B2010 | L,E | Repairs to pierrotage, limestone rubble set in clean, clay soil, handset and pointed flush with face of foundation logs - 20% Repair | 75 | SF | $ 60.00 | $4,500 | |
| B2010 | M | Repairs to pierrotage, limestone rubble set in clean, clay soil, handset and pointed flush with face of foundation logs - 20% Repair | 75 | SF | $ 1.00 | $75 | |
| B2010 | L | Remove Lead exterior paint - Allow | 228 | SF | $ 18.00 | $4,104 | |
| B2010 | E | Remove Lead exterior paint - Allow | 228 | SF | $ 2.00 | $456 | |
| | | | | | $ - | $0 | |
| | | **SUBTOTAL EXTERIOR CLOSURE** | **1** | **LS** | **$ 16,135.00** | **$16,135** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **TOTAL COST -** | | **Other Misc Repairs** | **1** | **LS** | **$ 16,135.00** | **$16,135** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |

**Summary Item** **Site Improvements** **Total Cost:** $12,325

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **G10** | | **SITE PREPARATION** | | | | | |
| G1030 | | Regrade site for New ADA stairs | 2286 | SF | $ 1.00 | $2,286 | Regrading at west for new accessible ramp |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | **SUBTOTAL SITE PREPARATION** | **1** | **LS** | **$ 2,286.00** | **$2,286** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **G20** | | **SITE IMPROVEMENTS** | | | | | |
| G2050 | L | Regrade soil around foundation and under porches to promote positive drainage, assume raising grade by 1'-0" at foundation wall and slope to existing grade over 6'-0" under each porch | 848 | SF | $ 4.25 | $3,604 | Regarding under porches after structural repairs are complete |
| G2050 | M | Regrade soil around foundation and under porches to promote positive drainage, assume raising grade by 1'-0" at foundation wall and slope to existing grade over 6'-0" under each porch | 848 | SF | $ 0.50 | $424 | |
| G2050 | E | Regrade soil around foundation and under porches to promote positive drainage, assume raising grade by 1'-0" at foundation wall and slope to existing grade over 6'-0" under each porch | 848 | SF | $ 0.25 | $212 | |
| | L | Seed Lawn area that was regraded | 2286 | SF | $ 0.15 | $343 | Lawn restoration |
| | M | Seed Lawn area that was regraded | 2286 | SF | $ 0.15 | $343 | |
| | E | Seed Lawn area that was regraded | 2286 | SF | $ 0.01 | $23 | |
| B1010 | L,E | New Cedar Stairs & Deck | 1 | EA | $ 1,680.00 | $1,680 | Accessible ramp at west |
| B1010 | M | New Cedar Stairs & Deck | 1 | EA | $ 3,410.00 | $3,410 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | **SUBTOTAL SITE IMPROVEMENTS** | **1** | **LS** | **$ 10,038.66** | **$10,039** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Site Improvements** | **1** | **LS** | **$ 12,324.66** | **$12,325** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item** | **Structural Repairs - Foundation** | **Total Cost:** | $351,973 |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **A10** | | **FOUNDATIONS** | | | | | |
| A1010 | L | Excavation for Foundation Timber Replacement - Small Machine | 60 | CY | $ 80.00 | $4,800 | Partial log replacement scope |
| A1010 | E | Small Excavator/Bobcat ( 6 Weeks Rental) | 1.5 | EA | $ 5,192.25 | $7,788 | |
| A1010 | L | Hand excavation Next to Foundation | 832 | SF | $ 6.00 | $4,992 | New supports for porches and shoring improvements |
| A1010 | L | Backfill W/ Excavated soil | 60 | CY | $ 80.00 | $4,800 | |
| A1010 | E | Small Excavator ( 4 Weeks Rental) | 1 | EA | $ 5,192.25 | $5,192 | |
| A1010 | L | 1' Dia x 4'D Concrete Foundation Pier | 31 | EA | $ 175.00 | $5,425 | |
| A1010 | M | 1' Dia x 4'D Concrete Foundation Pier | 31 | EA | $ 135.00 | $4,185 | |
| A1010 | E | 1' Dia x 4'D Concrete Foundation Pier | 31 | EA | $ 75.00 | $2,325 | |
| A1010 | L | 1' Dia x 4'D Concrete Foundation Pier @ New Stairs | 7 | EA | $ 50.00 | $350 | |
| A1010 | M | 1' Dia x 4'D Concrete Foundation Pier @ New Stairs | 7 | EA | $ 125.00 | $875 | |
| A1010 | E | 1' Dia x 4'D Concrete Foundation Pier @ New Stairs | 7 | EA | $ 75.00 | $525 | |
| A1010 | L | Remove & Replace Approx 8" Dia Hand Hewn Old Growth Logs - in 2 or 3 Log sections | 88 | EA | $ 800.00 | $70,400 | Rough costs, pending further pricing and information being researched |
| A1010 | M | Remove & Replace Approx 8" Dia Hand Hewn Old Growth Logs - in 2 or 3 Log sections - Allowance for Logs | 88 | EA | $ 1,000.00 | $88,000 | |
| A1010 | E | Remove & Replace Approx 8" Dia Hand Hewn Old Growth Logs - in 2 or 3 Log sections | 88 | EA | $ 100.00 | $8,800 | |
| A1010 | L,E | Pierrotage Infill W/ limestone rubble set in clean, clay soil, handset between new Logs. | 1000 | SF | $ 60.00 | $60,000 | Cost assumes documentation, salvage, and reuse of limestone |
| A1010 | M | Pierrotage Infill W/ limestone rubble set in clean, clay soil, handset between new Logs. | 1000 | SF | $ 10.00 | $10,000 | |
| A1010 | L,E | Remove & Reinstall/Reset 24"W Limestone existing foundation | 103 | LF | $ 64.00 | $6,592 | Limestone footing for replacement logs |
| A1010 | M | Remove & Reinstall/Reset 24"W Limestone existing foundation | 103 | LF | $ 5.00 | $515 | |
| A1010 | L | Repair Stone Foundations Walls @ Chimney & Piers W/ Earth Mortar | 321 | SF | $ 42.95 | $13,787 | Misc repairs to stone piers for first floor and chimney, all clay-set limestone |
| A1010 | M | Repair Stone Foundations Walls @ Chimney & Piers W/ Earth Mortar | 321 | SF | $ 5.05 | $1,621 | |
| A1010 | L,E, M | Temp Shoring Allowance for Log removal | 102 | LF | $500.00 | $51,000 | |
| | | | | | $0.00 | $0 | |
| | | | | | $ - | $0 | |
| | | | | | | | |
| | | | | | | | |
| | | **SUBTOTAL FOUNDATIONS** | **1** | **LS** | **$ 351,972.63** | **$351,973** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Structural Repairs - Foundation** | **1** | **LS** | **$ 351,972.63** | **$351,973** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item** | **Structural Repairs - Floor Construction** | **Total Cost:** | $112,964 |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **B10** | | **SUPERSTRUCTURE** | | | | | |
| B1010 | L,E | HSS Columns @ Basements | 2712 | LBS | $ 1.50 | $4,068 | Shoring improvements, priced as steel but lumber/timber can be explored |
| B1010 | M | HSS Columns @ Basements | 2712 | LBS | $ 1.75 | $4,746 | |
| B1010 | L,E | HSS Beams | 11978 | LBS | $ 2.25 | $26,951 | |
| B1010 | M | HSS Beams | 11978 | LBS | $ 1.75 | $20,962 | |
| B1010 | L,E | Base Plates W/Bolts | 31 | EA | $ 40.00 | $1,240 | |
| B1010 | M | Base Plates W/Bolts | 31 | EA | $ 38.00 | $1,178 | |
| B1010 | L,E | Temp Shoring for New Steel Beams | 200 | LF | $ 22.51 | $4,502 | |
| B1010 | M | Temp Shoring for New Steel Beams | 200 | LF | $ 7.15 | $1,431 | |
| B1010 | L,E | Remove and reinstall/level existing hardwood flooring in the east room | 607 | SF | $ 6.00 | $3,642 | |
| B1010 | M | Remove and reinstall/level existing hardwood flooring in the east room | 607 | SF | $ 1.50 | $911 | Partial porch reconstruction for access for structural repairs, assumes salvage of historic material |
| B1010 | L,E | Remove and reinstall base boards | 100 | LF | $ 5.00 | $500 | |
| B1010 | M | Remove and reinstall base boards | 100 | LF | $ 0.50 | $50 | |
| B1010 | L,E | Reconstruct Enclosed Porch floor Structure | 426 | SF | $ 15.50 | $6,603 | |
| B1010 | M | Reconstruct Enclosed Porch floor Structure | 426 | SF | $ 5.75 | $2,450 | |
| B1010 | L,E | Reconstruct Open Porch floor Structure | 553 | SF | $ 11.75 | $6,498 | |
| B1010 | M | Reconstruct Open Porch floor Structure | 553 | SF | $ 4.50 | $2,489 | |
| B1010 | L,E | Rebuild Stairs in Cedar | 1 | EA | $ 775.00 | $775 | Code compliant south stairs |
| B1010 | M | Rebuild Stairs in Cedar | 1 | EA | $ 540.00 | $540 | |
| B1010 | M | Black Dorken Fassade barrier | 1377 | SF | $ 1.10 | $1,515 | Related to HVAC improvements |
| B1010 | L,E | 2x10 Planks @ Attic areas - Stained | 1377 | SF | $ 3.70 | $5,095 | |
| B1010 | M | 2x10 Planks @ Attic areas - Stained | 1377 | SF | $ 4.30 | $5,921 | |
| B1010 | L | Reinstall Cedar Soffit on front Porch | 553 | SF | $ 2.25 | $1,244 | Partial porch reconstruction for access for structural repairs, assumes salvage of historic |
| B1010 | L,E | Seal porches | 979 | SF | $ 1.00 | $979 | |
| B1010 | M | Seal porches | 979 | SF | $ 0.20 | $196 | |
| | | | | | | | |
| | | **SUBTOTAL SUPESTRUCTURE** | **1** | **LS** | **$ 104,483.20** | **$104,483** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **F20** | | **SELECTIVE BUILDING DEMOLITION** | | | | | |
| F2010 | L | Demo Existing South Porch Soffit and save for reinstallation | 553 | SF | $ 1.50 | $830 | |
| F2010 | L | Demo Existing South Porch | 553 | SF | $ 1.90 | $1,051 | |
| F2010 | L | Demo Enclosed Porch & floor structure in North - salvage flooring if possible | 423 | SF | $ 4.25 | $1,798 | |
| F2010 | L | Demo Existing 6x6 Beams in Phases | 315 | SF | $ 2.50 | $788 | |
| F2010 | | Demo Existing 6x6x2'H Columns in Phases | 14 | EA | $ 35.00 | $490 | |
| F2010 | | Demo Existing 6x6x6'H Columns in Phases | 21 | EA | $ 25.00 | $525 | |
| F2010 | | Demo Flooring for New Foundation Pier and Patch back - approx area 3' x 3' | 20 | EA | $ 150.00 | $3,000 | |
| | | | | | $ - | $0 | |
| | | **SUBTOTAL SELECTIVE BUILDING DEMOLITION** | **1** | **LS** | **$ 8,480.45** | **$8,480** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Structural Repairs - Floor Construction** | **1** | **LS** | **$ 112,963.65** | **$112,964** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item** | **Interior Improvements** | **Total Cost:** | $83,723 |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **C10** | | **INTERIOR CONSTRUCTION** | | | | | |
| C1010 | L,E | New 5/8" Gypsum Board Walls @ Mechanical Room | 222 | SF | $ 8.58 | $1,905 | New mechanical room at north porch |
| C1010 | M | New 5/8" Gypsum Board Walls @ Mechanical Room | 222 | SF | $ 3.96 | $879 | |
| C1020 | L,E | New Wood 3' x 7' Wood Door & Frame | 1 | EA | $ 400.00 | $400 | |
| C1020 | M | New Wood 3' x 7' Wood Door & Frame | 1 | EA | $ 2,300.00 | $2,300 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | **SUBTOTAL INTERIOR CONSTRUCTION** | **1** | **LS** | **$ 5,483.88** | **$5,484** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **C30** | | **INTERIOR FINISHES** | | | | | |
| C3010 | L,M,E | Allowance for Misc Interior Restorations | 1350 | SF | $ 50.00 | $67,500 | |
| C3010 | L,E | Repair Finishes & Plaster walls at modified ADA Openings | 3 | EA | $ 500.00 | $1,500 | Accessibility modifications at interior doors |
| C3010 | M | Repair Finishes & Plaster walls at modified ADA Openings | 3 | EA | $ 100.00 | $300 | |
| C3010 | L,E | Refinish Floors @ Main Area due to Patches | 1350 | SF | $ 1.75 | $2,363 | |
| C3010 | M | Refinish Floors @ Main Area due to Patches | 1350 | SF | $ 0.25 | $338 | |
| C3010 | L,E | Clean & Treat all Wood in Crawl w/ Bora-Care Penetrating Preservative - Allowance | 1 | EA | $ 480.00 | $480 | Wood treatment in caveau after repairs |
| C3010 | M | Clean & Treat all Wood in Crawl w/ Bora-Care Penetrating Preservative - Allowance | 1 | EA | $ 120.00 | $120 | |
| C3010 | L,E | Misc Painting & Patching Allowance | 1 | EA | $ 1,000.00 | $1,000 | Related to north porch rehab |
| C3010 | M | Misc Painting & Patching Allowance | 1 | EA | $ 250.00 | $250 | |
| C3030 | L,E | New Wood Ceiling - Sealed @ North Porch | 426 | SF | $ 2.50 | $1,065 | |
| C3030 | M | New Wood Ceiling - Sealed @ North Porch | 426 | SF | $ 4.00 | $1,704 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | **SUBTOTAL INTERIOR FINISHES** | **1** | **LS** | **$ 76,619.00** | **$76,619** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **F20** | | **SELECTIVE BUILDING DEMOLITION** | | | | | |
| F2010 | L,E | Demo and Re-work Openings to Meet ADA | 3 | EA | $ 540.00 | $1,620 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | **SUBTOTAL SELECTIVE BUILDING DEMOLITION** | **1** | **LS** | **$ 1,620.00** | **$1,620** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **TOTAL COST -** | **Interior Improvements** | **1** | **LS** | **$ 83,722.88** | **$83,723** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item** | **Plumbing** | **Total Cost:** | $363 |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| Uniformat II WBS | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
| F20 | | SELECTIVE BUILDING DEMOLITION | | | | | |
| F2010 | L | Demolition of Existing WC | 1 | EA | $ 79.97 | $80 | Remove existing lavatory and fixtures at north porch. |
| F2010 | M | Demolition of Existing WC | 1 | EA | $ - | $0 | |
| F2010 | E | Demolition of Existing WC | 1 | EA | $ 2.40 | $2 | |
| F2010 | L | Demolition of Existing Wall Hung LAV | 1 | EA | $ 63.98 | $64 | |
| F2010 | M | Demolition of Existing Wall Hung LAV | 1 | EA | $ - | $0 | |
| F2010 | E | Demolition of Existing Wall Hung LAV | 1 | EA | $ 1.92 | $2 | |
| F2010 | L | Allowance for Removal of Piping and Cap | 1 | LS | $ 159.94 | $160 | |
| F2010 | M | Allowance for Removal of Piping and Cap | 1 | LS | $ 50.00 | $50 | |
| F2010 | E | Allowance for Removal of Piping and Cap | 1 | LS | $ 4.80 | $5 | |
| | | | | | | $0 | |
| | | | | | $ - | $0 | |
| | | **SUBTOTAL SELECTIVE BUILDING DEMOLITION** | **1** | **LS** | **$ 363.01** | **$363** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Plumbing** | **1** | **LS** | **$ 363.01** | **$363** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item** | **Mechanical** | **Total Cost:** | $74,813 |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **D30** | | **HVAC** | | | | | New furnace, A/C, ductwork, and related work |
| D3040 | | **** Distribution Systems *** | | | | $0 | |
| D3040 | L | Sheetmetal duct | 1688 | LBS | $11.56 | $19,513 | |
| D3040 | M | Sheetmetal duct | 1688 | LBS | $0.88 | $1,485 | |
| D3040 | E | Sheetmetal duct | 1688 | LBS | $0.35 | $591 | |
| D3040 | L | 4" Round Duct | 106 | LF | $5.59 | $593 | |
| D3040 | M | 4" Round Duct | 106 | LF | $4.20 | $445 | |
| D3040 | E | 4" Round Duct | 106 | LF | $0.17 | $18 | |
| D3040 | L | Duct Insulation | 1260 | SF | $6.36 | $8,014 | |
| D3040 | M | Duct Insulation | 1260 | SF | $0.51 | $643 | |
| D3040 | E | Duct Insulation | 1260 | SF | $0.20 | $252 | |
| D3040 | L | RGD's | 36 | EA | $56.48 | $2,033 | |
| D3040 | M | RGD's | 36 | EA | $105.15 | $3,785 | |
| D3040 | E | RGD's | 36 | EA | $1.70 | $61 | |
| D3040 | L | Air Intake Hood for ERV | 1 | EA | $307.87 | $308 | |
| D3040 | M | Air Intake Hood for ERV | 1 | EA | $1,484.40 | $1,484 | |
| D3040 | E | Air Intake Hood for ERV | 1 | EA | $9.24 | $9 | |
| D3050 | | **** Terminal & Package Units *** | | | | $0 | |
| D3050 | L | ERV, Energy Recovery Ventilator | 1 | EA | $846.73 | $847 | |
| D3050 | M | ERV, Energy Recovery Ventilator | 1 | EA | $9,785.17 | $9,785 | |
| D3050 | E | ERV, Energy Recovery Ventilator | 1 | EA | $25.41 | $25 | |
| D3050 | L | AC with Furnace System, Includes Heat & A/C | 1 | EA | $1,354.77 | $1,355 | |
| D3050 | M | AC with Furnace System, Includes Heat & A/C | 1 | EA | $17,318.00 | $17,318 | |
| D3050 | E | AC with Furnace System, Includes Heat & A/C | 1 | EA | $40.65 | $41 | |
| D3050 | L | Refrigerant Pipe | 1 | LS | $338.70 | $339 | |
| D3050 | M | Refrigerant Pipe | 1 | LS | $96.65 | $97 | |
| D3050 | E | Refrigerant Pipe | 1 | LS | $10.17 | $10 | |
| D3050 | L | Condensate Drain Pipe | 1 | LS | $169.35 | $169 | |
| D3050 | M | Condensate Drain Pipe | 1 | LS | $29.00 | $29 | |
| D3050 | E | Condensate Drain Pipe | 1 | LS | $5.09 | $5 | |
| D3050 | E | Rigging | 1 | LS | $ 2,500.00 | $2,500 | |
| D3060 | | **** Controls & Instrumentation *** | | | | $0 | |
| D3060 | L | Furnace Control Thermostat | 1 | EA | $169.35 | $169 | |
| D3060 | M | Furnace Control Thermostat | 1 | EA | $0.00 | $0 | |
| D3060 | E | Furnace Control Thermostat | 1 | EA | $5.09 | $5 | |
| D3070 | | **** System Testing & Balancing *** | | | | $0 | |
| D3070 | L | Air Testing and Balancing | 1 | LS | $1,524.11 | $1,524 | |
| D3090 | | **** Other HVAC Systems *** | | | | $0 | |
| D3040 | L | Coordination | 16 | HRS | $ 85.00 | $1,360 | |
| | | | | | $ - | $0 | |
| | | | | | $ - | $0 | |
| | | | | | $ - | $0 | |
| | | | | | $ - | $0 | |
| | | **SUBTOTAL HVAC** | **1** | **LS** | **$ 74,813.11** | **$74,813** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Mechanical** | **1** | **LS** | **$ 74,813.11** | **$74,813** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item** | **Fire Protection** | **Total Cost:** | $88,610 |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **D40** | | **FIRE PROTECTION** | | | | | |
| D4010 | | **** Sprinklers *** | | | | $0 | New dry-pipe fire protection system |
| D4010 | L | Sprinkler Heads - 1st Floor | 18 | EA | $38.74 | $697 | |
| D4010 | M | Sprinkler Heads - 1st Floor | 18 | EA | $22.90 | $412 | |
| D4010 | E | Sprinkler Heads - 1st Floor | 18 | EA | $1.17 | $21 | |
| D4010 | L | Sprinkler Heads - Attic | 23 | EA | $48.42 | $1,114 | |
| D4010 | M | Sprinkler Heads - Attic | 23 | EA | $28.63 | $658 | |
| D4010 | E | Sprinkler Heads - Attic | 23 | EA | $1.46 | $34 | |
| D4010 | L | Sprinkler Heads - Lower Level | 10 | EA | $48.42 | $484 | |
| D4010 | M | Sprinkler Heads - Lower Level | 10 | EA | $28.63 | $286 | |
| D4010 | E | Sprinkler Heads - Lower Level | 10 | EA | $1.46 | $15 | |
| D4010 | L | Dry Pipe - Attic | 320 | LF | $30.91 | $9,891 | |
| D4010 | M | Dry Pipe - Attic | 320 | LF | $13.76 | $4,403 | |
| D4010 | E | Dry Pipe - Attic | 320 | LF | $0.93 | $298 | |
| D4010 | L | Dry Pipe - First level | 290 | LF | $24.73 | $7,172 | |
| D4010 | M | Dry Pipe - First level | 290 | LF | $11.01 | $3,193 | |
| D4010 | E | Dry Pipe - First level | 290 | LF | $0.75 | $218 | |
| D4010 | L | Dry Pipe - Lower level | 120 | LF | $30.91 | $3,709 | |
| D4010 | M | Dry Pipe - Lower level | 120 | LF | $13.76 | $1,651 | |
| D4010 | E | Dry Pipe - Lower level | 120 | LF | $0.93 | $112 | |
| D4010 | L | Water Service w/ 4" BFP (within Mechanical Room) | 1 | LS | $815.31 | $815 | |
| D4010 | M | Water Service w/ 4" BFP (within Mechanical Room) | 1 | LS | $4,677.91 | $4,678 | |
| D4010 | E | Water Service w/ 4" BFP (within Mechanical Room) | 1 | LS | $65.11 | $65 | |
| D4030 | | **** Fire Protection Specialties *** | | | | $0 | |
| D4030 | L | Fire Pump w/ Controller, Assume 500 GPM/ 100PSI | 1 | EA | $3,755.70 | $3,756 | |
| D4030 | M | Fire Pump w/ Controller, Assume 500 GPM/ 100PSI | 1 | EA | $27,537.21 | $27,537 | |
| D4030 | E | Fire Pump w/ Controller, Assume 500 GPM/ 100PSI | 1 | EA | $187.79 | $188 | |
| D4030 | L | Air Compressor | 1 | EA | $476.70 | $477 | |
| D4030 | M | Air Compressor | 1 | EA | $1,593.14 | $1,593 | |
| D4030 | E | Air Compressor | 1 | EA | $14.31 | $14 | |
| D4030 | L | Dry Pipe Valve (Lower Level/1st Floor/Attic) | 3 | EA | $619.69 | $1,859 | |
| D4030 | M | Dry Pipe Valve (Lower Level/1st Floor/Attic) | 3 | EA | $3,776.32 | $11,329 | |
| D4030 | E | Dry Pipe Valve (Lower Level/1st Floor/Attic) | 3 | EA | $18.60 | $56 | |
| D4030 | L | FDC | 1 | EA | $247.88 | $248 | |
| D4030 | M | FDC | 1 | EA | $690.36 | $690 | |
| D4030 | E | FDC | 1 | EA | $7.44 | $7 | |
| D4090 | | **** Other Fire Protection Systems *** | | | | $0 | |
| D4090 | L | Coordination | 12 | HRS | $ 77.50 | $930 | |
| | | | | | $ - | $0 | |
| | | | | | $ - | $0 | |
| | | | | | $ - | $0 | |
| | | | | | $ - | $0 | |
| | | **SUBTOTAL FIRE PROTECTION** | **1** | **LS** | **$ 88,610.20** | **$88,610** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Fire Protection** | **1** | **LS** | **$ 88,610.20** | **$88,610** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |
| **Summary Item** | **Electrical** | **Total Cost:** | $43,100 |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **D50** | | **ELECTRICAL** | | | | | |
| D5010 | L,E | Common Electrical | 1 | LS | $ 6,000.00 | $6,000 | New electrical and panel |
| D5010 | M | Common Electrical | 1 | LS | $ 6,000.00 | $6,000 | |
| D5030 | L.E | IT Technology | 1 | LS | $ 3,750.00 | $3,750 | |
| D5030 | M | IT Technology | 1 | LS | $ 3,750.00 | $3,750 | |
| D5040 | L.E | Fire Alarm | 1 | LS | $ 2,500.00 | $2,500 | |
| D5040 | M | Fire Alarm | 1 | LS | $ 2,500.00 | $2,500 | |
| D5010 | L.E | New Electric Service/ Panel & Relocation | 1 | EA | $ 4,300.00 | $4,300 | |
| D5010 | M | New Electric Service/Panel & Relocation | 1 | EA | $ 4,300.00 | $4,300 | |
| D5010 | L.E | New Connection for HVAC Unit & Equipment | 1 | EA | $ 1,000.00 | $1,000 | |
| D5010 | M | New Connection for HVAC Unit & Equipment | 1 | EA | $ 1,000.00 | $1,000 | |
| D5010 | L | Electrical Demo Allowance | 1 | EA | $ 1,000.00 | $1,000 | |
| D5010 | L.E | New Connection for Fire Pump | 1 | EA | $ 1,000.00 | $1,000 | |
| D5010 | M | New Connection for Fire Pump | 1 | EA | $ 1,000.00 | $1,000 | |
| | | | 0 | | $ - | $0 | |
| | | **SUBTOTAL ELECTRICAL** | **1** | **LS** | **$ 38,100.00** | **$38,100** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **G 40** | | **SITE ELECTRICAL UTILITIES** | | | | | |
| | | | 0 | | $ - | $0 | |
| D5010 | L.E | Utility Overhead Relocation | 1 | EA | $ 3,750.00 | $3,750 | Exterior utility line and pole |
| D5010 | M | Utility Overhead Relocation | 1 | EA | $ 1,250.00 | $1,250 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | | 0 | | $ - | $0 | |
| | | **SUBTOTAL SITE ELECTRICAL UTILITIES** | **1** | **LS** | **$ 5,000.00** | **$5,000** | |

| Uniformat II WBS Code | Labor (L) Material (M) Equip ( E) | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Electrical** | **1** | **LS** | **$ 43,100.00** | **$43,100** | |

**United States Department of the Interior**
**National Park Service**
**Class C Construction Cost Estimate**

## LINE ITEM COST SUMMARY

| | | | |
|---|---|---|---|
| **Project:** | **Bauvais Amoureux House Repair** | **Estimate By:** | Jim Burke |
| **Park:** | **Ste. Geneviève National Historical Park** | **Date:** | 9/27/2021 Rev 2 |
| **Park Alpha:** | **STGE** | **Reviewed By:** | Reviewer |
| **PMIS Number:** | **311235** | **Date:** | Review Date |

**Summary Item** **Site Utlitiy Work** **Total Cost:** $23,664

| Uniformat II WBS Code | | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **G10** | | **SITE PREPARATION** | | | | | |
| G1020 | L, E | Sawcut & Remove Pavement in Street | 1 | LS | $ 2,500.00 | $2,500 | |
| | | | | | $ - | $0 | |
| | | | | | $ - | $0 | |
| | | | | | $ - | $0 | |
| | | **SUBTOTAL SITE PREPARATION** | **1** | **LS** | **$ 2,500.00** | **$2,500** | |

| Uniformat II WBS Code | | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **G20** | | **SITE IMPROVEMENTS** | | | | | |
| G2010 | L | Patch back Roadway for new connection | 1 | LS | $ 1,500.00 | $1,500 | |
| G2050 | M | Patch back Roadway for new connection | 1 | LS | $ 500.00 | $500 | |
| | E | Patch back Roadway for new connection | 1 | LS | $ 1,000.00 | $1,000 | |
| | L | Topsoil & Seed at new Trench | 600 | SF | $ 1.00 | $600 | |
| | M | Topsoil & Seed at new Trench | 600 | SF | $ 0.25 | $150 | |
| | E | Topsoil & Seed at new Trench | 600 | SF | $ 0.10 | $60 | |
| | | | 0 | Unit | $ - | $0 | |
| | | | 0 | Unit | $ - | $0 | |
| | | **SUBTOTAL SITE IMPROVEMENTS** | **1** | **LS** | **$ 3,810.00** | **$3,810** | |

| Uniformat II WBS Code | | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| **G30** | | **SITE CIVIL/MECHANICAL UTILITIES** | | | | | |
| G3010 | | **** Fire Water Line *** | | | | $0 | |
| G3010 | L | 4" DIP w/ Trenching | 104 | LS | $ 8.14 | $847 | |
| G3010 | M | 4" DIP w/ Trenching | 104 | LS | $ 34.83 | $3,622 | |
| G3010 | E | 4" DIP w/ Trenching | 104 | LS | $ 8.13 | $846 | |
| G3010 | L | Fittings | 2 | EA | $ 181.55 | $363 | |
| G3010 | M | Fittings | 2 | EA | $ 311.93 | $624 | |
| G3010 | E | Fittings | 2 | EA | $ 9.08 | $18 | |
| G3010 | L | Connection to Existing City Water Main w/ Valve | 1 | EA | $ 1,239.38 | $1,239 | |
| G3010 | M | Connection to Existing City Water Main w/ Valve | 1 | EA | $ 6,045.41 | $6,045 | |
| G3010 | E | Connection to Existing City Water Main w/ Valve | 1 | EA | $ 250.00 | $250 | |
| G3010 | M | Connection to City Water Main | 1 | EA | $ 3,500.00 | $3,500 | |
| | | | | | | | |
| | | | | | | | |
| | | **SUBTOTAL SITE CIVIL/MECHANICAL UTILITES** | **1** | **LS** | **$ 17,354.31** | **$17,354** | |

| Uniformat II WBS Code | | Description | Quantity | Unit | Cost/Unit | Total Cost | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **TOTAL COST -** | | **Site Utlitiy Work** | **1** | **LS** | **$ 23,664.31** | **$23,664** | |