BAILLY HOMESTEAD

CULTURAL LANDSCAPE AND HISTORIC STRUCTURES REPORT

VOLUME 2 | PART 2

INDIANA DUNES
NATIONAL LAKESHORE
PORTER, INDIANA



MAY 7, 2018
NPS PMIS # 20940



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Cover Image:
Bailly Homestead, Main House and Brick House, View looking Northeast.
(STRATA Architecture 2017)

Table of Contents

Signature Page
Table of Contents i
List of Figures v

VOLUME 1 | PART 1

Chapter 1 | Introduction

Summary 1.1
Location / Description of the Study Area 1.3
Bailly Homestead Significance 1.6
Project Goals 1.6
Report Organization 1.7
Project Team 1.8
Research and Report Methodology 1.9
Common History Errors 1.13
Future Research and Investigation Recommendations 1.14
Acknowledgements 1.15

Chapter 2 | Historical Background and Context

Introduction and Statement of Significance 2.1
Site History to 1822
Landscape 2.5
Early Inhabitants 2.6
European Explorers 2.8
Episode I. The Bailly Homestead, 1822-1918 ..... 2.10
Settlement by Joseph Bailly 1822-1835 ..... 2.14
Occupation by the Bailly Women 1835-1917 ..... 2.18
1918 Landscape Description 2.36
1918 Historic Period Landscape Plan
Episode II. Private Ownership, 1919-1971 ..... 2.41
Sisters of Notre Dame 1919-1937 ..... 2.42
La Roche Family 1937-1965 ..... 2.51
Other Private Owners 1965-1971 ..... 2.60
1971 Landscape Description 2.64
1971 Historic Period Landscape Plan
Episode III. Indiana Dunes National Lakeshore, 1971-2017 ..... 2.67
Early Site Modifications 1971-1977 ..... 2.68
Late Site Modifications 1978-2017 ..... 2.73
Building Chronologies 2.77
Main House Chronology Drawings

Brick House HS-19 Building Chronology..... 2.91
Two-Story Log House HS-20 Building Chronology 2.97
Storehouse HS-21 Building Chronology 2.104
Chapel HS-22 Building Chronology 2.110
Missing or Unknown Buildings and Structures 2.121

Chapter 3 | Cultural Landscape Condition and Analysis

Introduction 3.1
Assessment of Landscape Integrity 3.3
Contributing Features 3.5
Landscape Condition and Analysis 3.6
Natural Systems and Features..... 3.6
Spatial Organization and Land Use..... 3.8
Topography 3.9
Views..... 3.10
Vegetation 3.14
Circulation..... 3.18
Buildings and Structures 3.22
Small-scale Features 3.27
Archeological Sites 3.38
Existing Condition Drawings

Chapter 4 | Buildings Existing Conditions and Analysis

Introduction 4.1
Site Utilities 4.11
Drawings
Main House (HS-18)..... 4.17
Drawings
Brick House (HS-19)..... 4.167
Drawings
Two-Story Log House (HS-20) 4.215
Drawings
Storehouse (HS-21)..... 4.235
Drawings
Chapel (HS-22) 4.249
Drawings

VOLUME 2 | PART 2

Chapter 5 | Landscape Treatment Recommendations

Introduction 5.1
Treatment Workshop Summary 5.1
Rehabilitation Treatment Approach for Landscape and Buildings 5.5
Landscape Treatment Plan 5.8
Landscape Treatment Terminology 5.9
Priority Landscape Tasks 5.13
Landscape Treatment Zone 1 ..... 5.15
Landscape Treatment Zone 2 ..... 5.19
Landscape Treatment Zone 3 ..... 5.20
Landscape Treatment Drawings

Chapter 6 | Buildings Treatment Recommendations

Site Utilities 6.1
Drawing
Main House (HS-18) 6.5
Drawings
Accessible Overnight Accommodations Drawing
Brick House (HS-19) 6.29
Drawings
Two-Story Log House (HS-20) 6.41
Drawings
Storehouse (HS-21) 6.49
Drawings
Chapel (HS-22) 6.53
Drawings
Proposed New Universally Accessible Overnight Accommodations 6.61
Drawings

Chapter 7 | Landscape Treatment Implementation Plan

Introduction 7.1
Work Orders 7.2

Bibliography

Appendices

Appendix A – Fireplace Tiles

Appendix B – Historic Numbered Photo Set

Appendix C – Chronology of Known Alterations

Appendix D – 1977 Architectural Drawings

Appendix E – Structural Calculations

Appendix F – Material Analysis - Wood Species Testing

Appendix G – Asbestos and Lead-Based Paint Survey Report

Appendix H – Treatment Alternative Workshop

Appendix I – Landscape Treatment Alternatives

Appendix J – Tree Inventory

Appendix K – Magnitude of Cost Estimates



Bailly Homestead, view looking northwest, ca. 1924. (INDU Museum Collection)

5 LANDSCAPE TREATMENT RECOMMENDATIONS

Chapter 5 | Landscape Treatment Recommendations

Introduction

This chapter includes the recommended landscape treatment for the Bailly Homestead at Indiana Dunes National Lakeshore. The recommendations seek to recapture the historic character of the Bailly Homestead by rehabilitating buildings and site features to protect historic resources, support interpretation, and expand compatible use of the site.

The chapter begins with a summary of decisions made during a Treatment Alternatives Workshop held in August 2017, including establishment of specific goals for final treatment of the property. This is followed by an explanation of the selection of Rehabilitation as the most appropriate treatment approach for the Bailly Homestead landscape and buildings.

The Landscape Treatment Plan provides guidance for rehabilitating the historic landscape through preservation of extant landscape characteristics and features, restoration of selected missing features, and addition of compatible elements to support future use. Terminology used throughout the landscape treatment section is defined followed by an explanation of landscape treatment zones. Immediate tasks recommended to address safety and stabilization concerns are presented first. These are followed by recommendations organized according to the four treatment zones.

Recommendations for implementation of the landscape treatment are provided in the form of Work Orders in Chapter 7. Landscape treatment alternatives that were developed and analyzed as part of the project are in Appendix G. Recommendations for the treatment of buildings are provided in Chapter 6.

Treatment Workshop Summary

The Bailly Homestead Cultural Landscape and Historic Structures Report (CLHSR) team held a Treatment Alternatives Workshop at the National Lakeshore in August 2017. The purpose of the workshop was to review the relevant historic information, current conditions of the property and buildings, discuss treatment potential and issues for the Bailly Homestead site and buildings, and to develop a preferred treatment use for them for further exploration.

Participants in the workshop included: Park staff; representatives from the National Park Service (NPS) Midwest Regional Office (MWRO); Indiana Landmarks; Indiana State Historic Preservation Office (phone); and the CLHSR team.

The CLHSR team presented the archival research and historic timeline completed by the team to date. This information is important when identifying significant features of the landscape and buildings. Information related to the historic use of the land in and around the homestead was discussed, as well as identifying landscape character defining features, and the existing



Figure 5.1. Treatment Alternatives Workshop at the park, August 2017. (STRATA 2017)

conditions of the immediate landscape surrounding the homestead. Integrity of the landscape was a large part of the discussion, as much of the site integrity has been diminished due to the loss of important landscape features, including the farm fields, orchards, lower prairie, original bridge, landscaping around the Main House, and the loss of the Wedding Trees. Current and potential site utilities and amenities were also discussed, as were the issues with bringing new utilities to the remote site. Structural issues, mostly surrounding the framing at the Main House, were discussed in detail. Architectural observations were noted, which pertained to the significant historic character defining features and current conditions. Options and substantial limitations were discussed for each building to accommodate ADA accessibility.

The park identified that preserving the house and allowing public access to the house and site were priorities for the development. Discussion focused on how to prioritize and balance the proposed work with retention of historic fabric in equal importance to the ability to allow access to the property.

Workshop attendees were presented with sufficient information regarding the building and site existing conditions to agree that Rehabilitation is the appropriate treatment for the site and buildings. The Bailly Homestead National Historic Landmark was designated for its “exceptional significance in American history.” By assuming the preservation and retention of character defining features is required during Rehabilitation, this approach allows for maintenance, repairs, and much-needed treatment of the buildings and landscape for visitor use. This approach will allow for interpretation and use of the buildings in their historic setting, while providing visitor services, recreation, and accommodations.

Several options for potential use of the site and individual buildings were explored and vetted. Uses that would cause irreversible damage to the buildings or site were immediately dismissed, as were incompatible uses and items that would exclude public access.

A specific long-term use for the site and buildings was not determined at the workshop. The concept of a multi-use venue with overnight accommodations was selected as a goal for the future treatment of the property. This broad definition would allow for many types of uses and flexibility, including overnight accommodations, weddings, retreats, education workshops, demonstrations, small classes, outdoor events, and to support the park's many recreational opportunities. Most importantly, the site and buildings would be functional for the first time in nearly fifty years, with the ability for visitors to enjoy and explore the Bailly Family legacy.

Overnight accommodations and providing venues for special events will require that the site and some of the buildings become ADA accessible. This would include the primary service building and at least one facility for overnight accommodations. The historic buildings are not easily updated to accommodate accessibility without major alterations which would likely diminish the historic integrity of the buildings. Examples of potential alterations were presented during the workshop, and attendees agreed that these were not acceptable to implement due to visibility, lack of reversibility, and cost. The only exception was that the basement of the Main House may be made accessible and could be used to support special events. ADA accessible overnight accommodations would best be made in a separate, new structure outside of the core of the historic homestead and designed to blend with the historic environment.

A flat area to the west of the Chapel and Two-Story Log House could be used for special event space and tent structures. This location allows ease of access to the basement of the Main House for potential catering space in a small kitchen.

A new comfort station was discussed that might be constructed at the north end of the property, closer to the trails. This could be used as a comfort station for overnight camping, as well. There was no consensus on whether there was a need for overnight camping or the comfort station at this time, as visitors can currently use the Visitor Contact Station at Chellberg or potentially another building on the site. If overnight camping were desired in the future, this could be located between the north field and the northwest parking lot, to the west of the existing trail.

Attendees agreed that parking on site would be very limited, accommodating handicapped parking spaces near the Main House and the ADA overnight accommodations.

Agreement that the overall direction for the Bailly Homestead should serve multiple uses led the CLHSR team to develop a Rehabilitation-based plan for future planning and interpretive efforts, including the magnitude of construction costs. The treatment recommendations for the treatment of the site and buildings identify recommendations for the preservation of character defining features and elements, as well as outlining Immediate (Priority) and Long Term maintenance and rehabilitation objectives.

Treatment recommendations for the site include the maintenance of trees and landscape, site access, lighting, identification of recreational opportunities, and the challenges and viable alternatives for delivering new utilities to the site, and for providing accessibility to the Main House, Brick House, and Chapel from a proposed parking area. Consideration of missing landscape features such as walkways, planting beds, an orchard, and a garden at the Brick House were discussed for interpretation or potential rehabilitation. Treatment for the buildings includes recommendations for the preservation of character defining features and elements while outlining the challenges associated with the individual building treatments.

Landscape Treatment is presented following this section, and Treatment related to the individual buildings are presented in Chapter 6. Magnitude of Cost Estimates for the specific site and landscape are in Appendix K.

Rehabilitation Treatment Approach for Landscape and Buildings

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

Treatment recommendations for the Bailly Homestead are founded upon Federal standards and guidelines. In particular, guidance for preparation of cultural landscape treatment recommendations is provided by *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* and *National Park Service Director's Orders 28: Cultural Resources Management Guidelines*.[346] The treatment of historic buildings is developed according to *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, and Restoring & Reconstructing Historic Buildings*.[347]

For buildings and landscape, the SOI defines four approaches to treatment, including Preservation, Restoration, Rehabilitation, and Reconstruction.[348] This section describes the basic concept for each approach then explains the appropriateness of that approach for guiding the future treatment of the Bailly Homestead.

Preservation

Preservation includes applying measures to sustain the existing form, integrity, and materials of the contributing features of a historic property. This baseline approach focuses upon stabilizing and protecting extant historic resources, rather than replacing missing elements. It is appropriate when a historic property is intact and does not require extensive repair or replacement and when continuing or new use does not require additions or alterations. Depiction at one particular period of time is not appropriate under this approach.[349]

Although Preservation could be applied to the study area, it is not the most appropriate overall approach because the goal to provide visitor access, facilities, and interpretation of the historic site requires alterations consistent with a rehabilitation philosophy. Rehabilitation allows for the

[346] Charles A. Birnbaum, and Christine Capella Peters, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, (Washington, DC: Department of the Interior, National Park Service, 1996); and NPS DO 28, 1997.
[347] Anne E. Grimmer, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, (Washington, DC: Department of the Interior, National Park Service, 2017).
[348] Grimmer, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Building, 2-3; Birnbaum and Peters, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, 3-5.
[349] Birnbaum and Peters, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, 17-18.

preservation of selected components of the site and the tasks include guidance for preservation of contributing landscape characteristics and features.

Rehabilitation (Recommended Approach)
The act or process of Rehabilitation allows repairs, alterations, and additions necessary to enable a compatible use for a property, as long as the portions or features which convey the historical, cultural, or architectural values are preserved. This approach is appropriate when depiction at one particular period of time is not appropriate; repair or replacement of deteriorated features is necessary; and alterations or additions are needed for a new use.[350]

Rehabilitation has been selected as the most appropriate overall treatment approach for the Bailly Homestead. This approach has been selected because of the existence of features related to multiple historic periods, relatively few remaining historic features, and the need for alterations to improve visitor access and enhance visitor experience.

Rehabilitation of the property is recommended with an emphasis on Preservation of extant features that contribute to the historic significance of the site. These are associated with the period of significance, 1822 to 1918, when the descendants of Joseph Bailly owned the property. Treatment aims to support the aspects of the landscape and buildings that remain from the period of significance; however, the integrity of homestead character and features are impacted by a high degree of change since the end of the period. This approach also allows for rehabilitating selected features to provide for compatible uses such as interpretation, education, and recreation. At the Bailly Homestead this includes improving vehicular access, parking, trails, interpretive information, restrooms, and other amenities necessary to support future use.

Restoration
Restoration is the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period in time. This includes Reconstruction of missing features from the target period, and removal of features from all other periods. The approach can be considered only when the property's significance during a particular period of time outweighs the loss of extant elements from other historical periods; and when there is substantial physical and documentary evidence for the work; and when contemporary alterations and additions are not planned.[351]

Restoration is not appropriate as a landscape treatment for the Bailly Homestead due to the small number of extant historic features and limited documentation concerning detailed information for the historic character and features of the Bailly Homestead. Additionally, the features necessary to support future site uses identified by the NPS differ from the non-extant landscape and building features associated with the Bailly family's private residence and farm.

[350] Birnbaum and Peters, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, 47-48.
[351]Birnbaum and Peters, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, 89-90.

Reconstruction

Reconstruction is the act or process of using new construction to depict a non-surviving site, landscape, building, structure, or object as it appeared at a specific period of time in its historic location. The approach is appropriate only when the property's significance during a particular period of time outweighs the potential loss of extant features that characterize other historical periods. In addition, there must be substantial physical and documentary evidence for the work, and the work must be clearly identified as a contemporary re-creation.[352]

The buildings and overall landscape associated with the study area are not eligible for reconstruction because adequate documentary evidence does not exist to apply a Reconstruction approach to the property.

[352] Birnbaum and Peters, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, 127-129.

Landscape Treatment Plan

This landscape treatment plan provides guidance for rehabilitating the landscape at the Bailly Homestead. It describes the desired future conditions of the landscape but does not provide construction-level details necessary for construction. Implementation guidance for the recommended landscape treatment is provided in Chapter 7, in the form of work orders that package the treatment tasks as projects for funding purposes.

The CLHSR applies the overall treatment approach of Rehabilitation to the cultural landscape.

The overall intent of the landscape treatment is to rehabilitate selected visual and spatial qualities of the cultural landscape to represent the end of the period of significance, 1918, enhance the historic character of the approach to the property and the domestic landscape surrounding the primary buildings, and provide access and new, compatible visitor amenities through a limited Rehabilitation approach. Additional, specific landscape treatment recommendations are provided for each of the three landscape treatment zones.

Landscape Treatment Terminology

The following terminology is used to describe recommended treatment actions for the cultural landscape of the Bailly Homestead.[353]

Add refers to the installation of new features required for new compatible use that is harmonious with the preservation of the historic spatial organization and land patterns. Additions should be considered only after it is determined that those needs cannot be met by altering secondary (i.e. non-character defining) spatial organization and land patterns. Additions should be planned, designed, and installed to be clearly differentiated from the character-defining features, so that these features are not radically changed, obscured, damaged, or destroyed.

Consider is to routinely evaluate if a treatment action can be undertaken. Budget restraints or long-term maintenance may necessitate implementation of the treatment at a later point in time or beyond the immediate term. For example, pruning recommendations for historic character require a plant first to grow to sufficient size.

Construct / Install is to build or erect a new, non-historic feature or service that is compatible with the cultural landscape. This may also include the replacement of a missing historic feature.

Plant refers to the placement of woody or herbaceous vegetation or its seeds in the ground so that it can grow.

Preserve refers to those measures necessary to sustain the existing form, integrity, and materials of contributing features. It includes initial stabilization work, where necessary, as well as ongoing preservation maintenance and repair of historic materials and features.

Protect refers to actions to safeguard a historic feature by defending or guarding it against further deterioration or loss. Such action is generally of temporary nature and anticipates future preservation treatment.

Provide is to make available the facilities and services necessary to support visitor experience within the cultural landscape.

Rehabilitate refers to the act or process of allowing compatible use through repair, alteration, or additions as long as those features that convey the historical, cultural, or architectural values are preserved.

[353] Adapted from Birnbaum and Peters, The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes; National Park Service, "Workflows Definitions," accessed December 22, 2015, http://www.nps.gov/dscw/definitions.htm; and Merriam-Webster's Collegiate Dictionary, 11th ed. Springfield, MA: Merriam-Webster, 2003, also available at http://www.merriam-webster.com/.

Remove refers to the act of eliminating a feature from its location through extraction or demolition. Such action is generally applied when non-contributing features impede the establishment of other preservation treatments.

Repair refers to those measures that are necessary to correct deteriorated, damaged, or faulty materials of features. These measures are more extensive than regular maintenance and undertake work necessary to bring a contributing feature or area to a desired condition.

Replace in-kind refers to the replacement of a feature that is extensively deteriorated or missing parts of features, using materials that match historic detail, configuration, and appearance as closely as possible.

Restore refers to those measures necessary to accurately depict the form, features, and character of a property as it appeared during a particular period of time by means of the removal of features from other periods in history and reconstruction of missing features from the restoration period.

Stabilize refers to those measures that require more work than standard maintenance practices, and that are necessary to prevent the further deterioration, failure, or loss of contributing features.

Landscape Treatment Zones

Landscape treatment zones are used to organize the landscape treatments according to spatial locations in the landscape. Each zone relates to different levels of historic documentation and integrity, programmatic opportunities, and the potential for new development.

The area specified for landscape treatment encompasses two landscape character areas (LCAs) of the historic homestead (see Figures 5.2 and 5.3). The scope of the CLHSR includes the developed plateau of the Bailly Homestead which contains LCAs 1 and 2.[354]

Landscape Treatment Zone 1 – Domestic Landscape LCA subcomponents: Entry Drive, Main House and Chapel Grounds, Brick House Grounds, and Log Building and Support Grounds

Landscape Treatment Zone 2 – Domestic Landscape LCA subcomponent: Storehouse Grounds

Landscape Treatment Zone 3 – Farm LCA subcomponent: Possible Orchard and Barn Area

[354] No treatment is presented for LCAs 3, 4, and 5, which are located outside of the core study area of this report.

Visual separation and greater levels of documentation and integrity in Zone 1 of the Domestic Landscape LCA enable the enhancement of historic character to a greater degree than in the other treatment zones.

Prior to presentation of the treatments by zone, a list of Priority (Immediate) Landscape Tasks includes work related to safety or stabilization that should be undertaken as soon as possible. Landscape treatment tasks are referenced by location on Long Term Treatment Recommendation Drawings: Landscape (LT1).

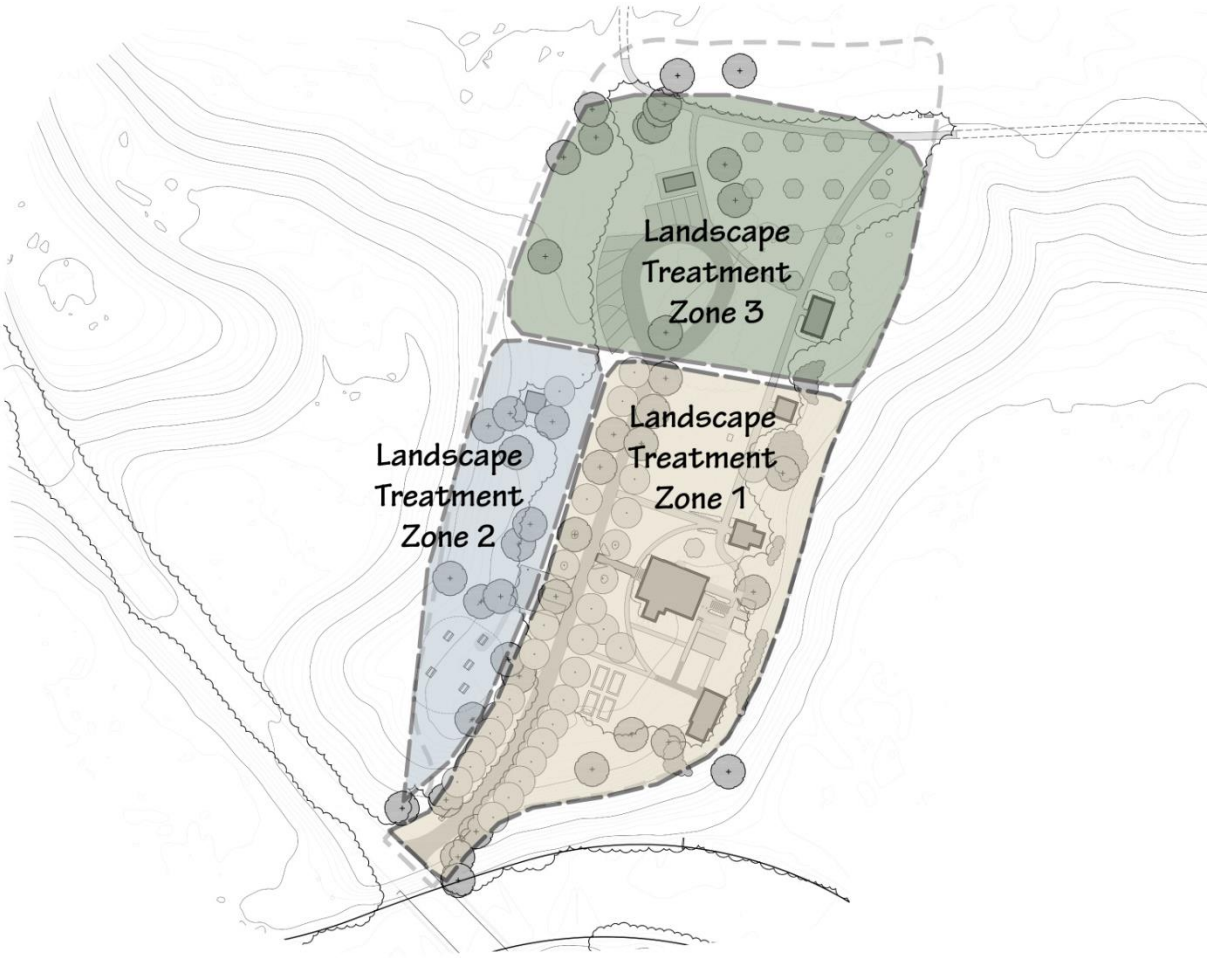


Figure 5.2 Bailly Homestead Landscape Treatment Zones. (QEA 2017)

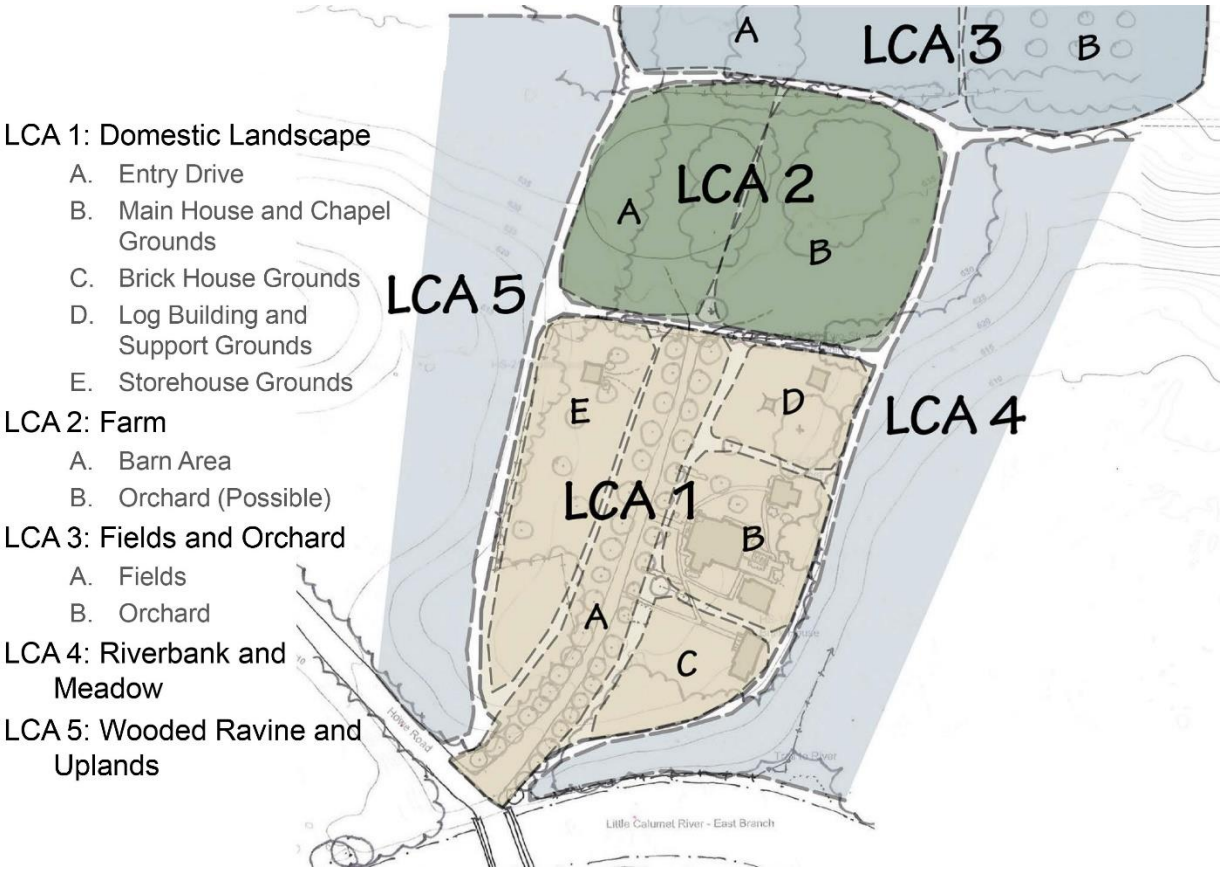


Figure 5.3 Bailly Homestead Landscape Character Areas on 1918 Period Plan. (QEA 2017)

Priority Landscape Tasks

Priority or Immediate Landscape Tasks (PT) relate to known risks to health and safety or the emergency protection of resources from known threats. Implementation of these treatments should be undertaken as soon as possible.

These tasks are coded PT1, PT2, and locations are illustrated on Figure 5.4 Priority Landscape Task Locations.

PT1. Address hazardous trees that present defects with potential to fall on a nearby target.

a. Remove 5 standing dead hazardous trees:
Remove Tree 14 black locust (*Robinia pseudoacacia*) (RP20E) west bank of entry drive.
Remove Tree 55 white ash (*Fraxinus americana*) (FA16E) southwest of Brick House.
Remove Tree 53 black locust (*Robinia pseudoacacia*) (RP13E) south of Brick House.
Remove Tree 52 black locust (*Robinia pseudoacacia*) (RP10E) south of Brick House.
Remove Tree 41 white ash (*Fraxinus americana*) (FA36E) northwest of Storehouse.

b. Prune deadwood from hazardous tree in poor condition:
Prune Tree 23 red maple (*Acer rubrum*) (AR25D) east on Entry Drive Allée, northwest of Chapel.

PT2. Stabilize and rehabilitate approximately 145 feet of the Entry Drive and Allée to ensure safe visitor and staff access, maintain the historic roadway, allow the replacement of the historic allée, prevent erosion, and reduce the potential collapse of trees. The current entry drive ascends a steep embankment of sandy, erodible soils at a slope of approximately 12%. Side slopes range between 27% and 41%. There is evidence of bank failure, tree decline, and surface erosion. Undertake a comprehensive design process to develop construction drawings for this task. Address the following:

a. Repair road by regrading and paving approximately 145’ length between Howe Road and crest of hill. Consider paving with chip and seal asphalt and local stone aggregate to a width and intersection radii that accommodates emergency vehicles and provide drainage swales adjacent to road edges. Regrade banks along road to achieve a moderate slope to support revegetation and control runoff. Stabilize banks with erosion protection. Rehabilitate Entry Drive Allée in this area as necessary by planting approximately 6 trees 15 feet from the Entry Drive centerline 22 feet apart. Plant a mixture of bur oak (*Quercus macrocarpa*), sugar maple (*Acer saccharum*), and butternut (*Carya cinerea*).

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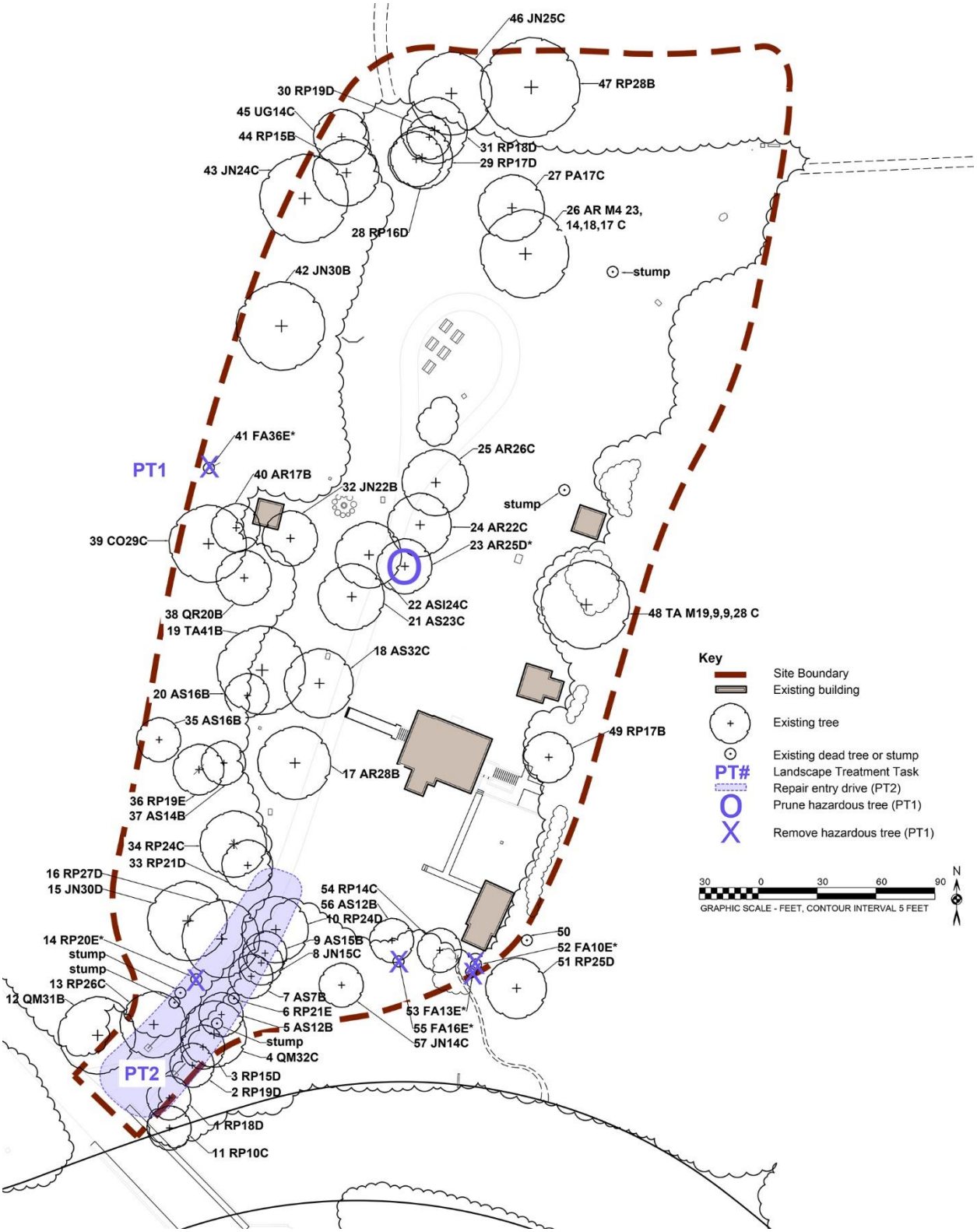


Figure 5.4 Priority Landscape Task Locations. (QEA 2017)

CULTURAL LANDSCAPE AND HISTORIC STRUCTURES REPORT

BAILLY HOMESTEAD

INDIANA DUNES NATIONAL LAKESHORE

TREATMENT RECOMMENDATIONS

PORTER, INDIANA

Trail to Dunes Learning Center and Bailly Cemetery (Little Calumet River Trail System)

LT3.7 **Comfort Station**

Trail to Bailly Homestead and Chellberg Farm Visitor Center Contact Station (Little Calumet River Trail System)

LT3.6

LT3.11

LT3.10

LT3.5

LT3.12

LT3.4

LT3.9

LT3.2 **Universally Accessible Building**

LT3.8

LT3.4

LT3.3

LT3.1

HS-21 Storehouse

LT2.1

LT1.14

LT1.15

HS-20 Two-Story Log Building

LT1.13

LT1.17

LT1.11

LT2.3

LT1.10

HS-22 Chapel

LT2.2

HS-18 Main House

LT1.9

LT1.4

LT1.7

LT1.6

LT1.5

LT2.5

LT1.1

LT1.8

LT2.4

LT1.2

LT1.3

HS-19 Brick House

LT1.16

Howe Road

LT1.12

Little Calumet River East Branch

Key

- Site Boundary
- Existing Tree
- Add Canopy Tree
- Add Fruit Tree
- Add Shrub
- Existing Planting Bed
- Add Planting Bed
- Add Tree and Shrub Buffer Planting
- Provide Open Understory and Canopy
- Add Raised Bed
- Add Picnic Table
- Add Overhead Light
- Remove/Relocate Overhead Light
- Add Electrical Box
- Add Fire Hydrant
- Existing Paving
- Add New Paving
- Add New Boardwalk
- Repair Drive for Accessibility
- Add New Asphalt Paving
- Existing Building
- Add Building

30 0 30 60 90

GRAPHIC SCALE - FEET, CONTOUR INTERVAL 5 FEET

N

DESIGNED: GDV	SUB SHEET NO. LT1	CULTURAL LANDSCAPE AND HISTORIC STRUCTURES REPORT	TITLE OF PROJECT: LONG TERM TREATMENT RECOMMENDATION DRAWING
CADD: GDV		UNITED STATES DEPARTMENT OF THE INTERIOR	LANDSCAPE
TECH. REVIEW: BW		NATIONAL PARK SERVICE DENVER SERVICE CENTER	BAILLY HOMESTEAD
DATE: 05/07/18			INDIANA DUNES NATIONAL LAKESHORE
			REGION: MIDWEST; COUNTY: PORTER; STATE: INDIANA

DRAWING NO. 626 138629

PMIS/PKG NO. 20940

SHEET 1 OF 1

Landscape Treatment Zone 1

This zone encompasses four component landscapes of the Domestic Landscape LCA including the Entry Drive, Main House and Chapel Grounds, Brick House Grounds, and Log Building and Support Grounds. In this zone, extant historic features are preserved and the historic landscape patterns and features are rehabilitated to enhance historic character and support future use of the site. The pattern of missing historic features is rehabilitated using materials that are differentiated from new features. For example, new walks in historic locations are paved with light colored aggregate while dark colored aggregate identifies the surface of new walks in locations where paths did not historically exist. Known historic plantings such as the Entry Drive Allée, individual trees, and beds are replaced in kind or in the character of historic plant materials. The provision of treatment recommendations begins with the Entry Drive and moves north through the site.

Landscape Treatment Zone Tasks (LT) for this zone are coded by number and locations are illustrated on Long Term Treatment Recommendation Drawing: Landscape (LT1).

LT1.1. Rehabilitate the Entry Drive and Allée on the homestead plateau (beyond the crest of the entry slope).

a. Repair road for 215’ distance between crest of hill and end of allée; maintain existing width; pave with consolidated crushed fines of limestone or other locally available material that meets NPS standards for universal accessibility.

b. Restore historic Entry Drive Allée.

i. Protect existing trees along Entry Drive Allée (Trees 23, 24, 25 east side; Trees 17, 18, 21, 22, 33 west side) (Figure 5.4).

ii. Plant 12 trees on plateau, approximately 15 feet from the Entry Drive centerline and 22 feet apart on center; provide a mixture of appropriate native species that are capable of being limbed at heights of approximately 20 feet.

LT1.2. Add walk to Brick House.

a. Option 1: Construct brick walk 61’ long and 3’ wide from Entry Drive to existing top of steps at Brick House to match width of existing steps and walk;

b. Option 2, Universally Accessible Option: In addition to Option 1, construct 13’ long and 4’ wide wood boardwalk with railings from new porch of Brick House.

LT1.3. Consider Brick House garden (*discussed during Treatment Workshop).*

a. Option 1: Consider addition of 4 raised beds, 6’x15’, in location of historic flower garden; provide garden soil for vegetable, herb, or flower plantings. The maintenance plan for the garden would be determined by Park staff and likely associated with occupants of the Main House or Brick House.

b. Option 2: Consider addition of native rose shrubs in a 15’x20’ to interpret the historic rose garden near the Brick House.

LT1.4. Rehabilitate walk connections between Brick House, Main House, and Chapel.

a. Construct 67’ long and 3’ wide arcing walk between top of Brick House steps at walk and brick landing at base of Main House west porch steps; pave with concrete seeded with light aggregate.
b. Construct 55’ long and 3’ arcing walk between Chapel threshold and top of brick landing at base of Main House west porch steps; pave with concrete seeded with light aggregate.

LT1.5. Rehabilitate walk south of Main House.

a. Add 38’ long and 3’ wide light aggregate concrete walk from new walk between Brick House and Main House and existing concrete north-south walk (between Main House and Brick House).

LT1.6. Provide Universal Access from existing concrete walk between Main House and Brick House and patio area southeast of Main House.

a. Add 32’ long and 3’ wide concrete sloped walk seeded with dark aggregate following NPS accessibility standards south of existing retaining wall at south side of patio area east of Main House.

LT1.7. Rehabilitate concrete patio east of Main House.

a. Stabilize and repair concrete block planters.
b. Replace in-kind concrete block retaining walls at south side of patio with compatible material.
c. Replace in-kind concrete paving with compatible material.

LT1.8. Interpret Laundry House location with multiuse patio.

a. Install patio in approximate location of historic Laundry House; construct 13’x19’ space with crushed fines of limestone; indicate location of 2 historic cisterns with limestone pavers.

LT1.9. Construct barrier-free walk between Chapel and Main House east patio.

a. Add 22’ long and 5’ wide sloped concrete walk between walk at Chapel threshold and Main House east patio; connect to 25’ long and 5’ wide ramp between sloped walk and north side of patio; pave with concrete seeded with dark aggregate.

LT1.10. Rehabilitate historic plantings of the Main House grounds.

a. Plant 1 shingle oak (*Quercus imbricaria*) south of the Main House and north of the Brick House garden.
b. Plant 1 disease resistant apple (*Malus pumila*) or cherry (*Prunus* sp.) tree north of the Main House.
c. Install 2 planting beds (70 square feet [sf]) of herbaceous plants in the planters of the Main House east patio.
d. Install 2 planting beds (160 sf) or herbaceous plants at the east side of the Main House east patio.

e. Plant 1 white lilac (*Syringa vulgaris* var. alba) shrubs north of the Main House east patio.
f. Install 2 bridal wreath spirea (*Spiraea* x *vanhouttei*) shrubs on the south side of the conservatory, south of the Main House.
g. Install planting beds (150 sf) of low, foliage-dominant, native plants along the west side of the Main House. Suggestions include starry false Solomon's seal (*Maianthemum stellatum*) and Christmas fern (*Polystichum acrostichoides*).
h. Install 2 beds (70 sf) of daylilies (*Hemerocallis* sp.) flanking the brick entry walk to the Main House. Plants may be transplanted from numerous existing areas with daylily on site.
i. Plant grape hyacinth bulbs in beds (120 sf) around the 4 trees of the allée flanking the brick entry walk to the Main House.
h. Install 2 winterberry (*Ilex verticillata*) shrubs flanking the west end of the brick entry walk to the Main House.

LT1.11. Rehabilitate historic plantings of the Chapel grounds.
a. Install planting beds (40 sf) for herbaceous plants along the west side of the Chapel.
b. Plant 2 purple lilac (*Syringa vulgaris)* shrubs on the south side and 2 purple lilac shrubs on the north side of the Chapel.
c. Plant a Dutch-elm disease resistant American elm (*Ulmus americana*) north of the Chapel.

LT1.12. Add overhead light.
a. Remove 2 existing overhead lights and reserve 2 overhead lights for reuse.
b. Relocate one existing overhead light east of the intersection of Howe Road and the Entry Drive.

LT1.13. Interpret location of non-extant windmill.
a. Option 1: Retain concrete well cover in situ and consider addition of four ground-level limestone pavers and interpretive information to indicate the location of the 11.5’x11.5’ base of the windmill and well.
b. Option 2: Repair turf surface and provide interpretive information about location of the windmill and well. Remove concrete well cover, cap well pit as appropriate based on investigation, and replace soil and turf surface.

LT1.14. Add electric box.
a. Add electric box at south edge of screen plantings west of Two-Story Log Building to service events in clearing.

LT1.15. Add walk between Chapel, Two-Story Log Building, and new accessible building north of Landscape Treatment Zone 1.
a. Construct 165’ long and 5’ wide walk west of buildings; pave with concrete seeded with dark aggregate; connect at south to new southeast walk between Main House and Chapel; connect at north to walk to north parking area.

LT1.16. Monitor erosion of hillside east of the core of the Bailly Homestead. Known as the "meadow" during the period of significance, this once open space provided partially open views across layers of canopy cover to the Little Calumet River. This area is visually associated with Landscape Treatment Zone 1.

a. Consider periodic monitoring of elevation and distances between buildings and top of slope and hillside vegetation.

LT1.17. Preserve tree canopy of Landscape Treatment Zone 1.

a. Consider monitoring the all trees in Landscape Treatment Zone 1 by a certified arborist for hazard identification and pruning/treatment as necessary on a regular basis.

b. Repair viewshed by clearing approximately 6,670 sf of woody vegetation from existing forest edge to allow more open views through Entry Drive Allée and along the east edge of the plateau.

Landscape Treatment Zone 2

Zone 2 correlates to the Storehouse Grounds of the Domestic Landscape LCA. It contains few extant historic features yet is visually connected to the entire west side of landscape treatment zone 1. The area presents an opportunity to provide interpretive functions and visitor amenities such as limited accessible parking and a picnic area.

Landscape Treatment Zone 2 Tasks are coded LT2.#, and locations are illustrated on Drawing Long Term Treatment Recommendation Drawings: Landscape.

LT2.1. Rehabilitate Storehouse vegetation.

a. Plant 1 shingle oak (*Quercus imbricaria*) north and east of the Storehouse, opposite the existing black walnut.

b. Plant 2 American hazelnut (*Corylus americana*) shrubs flanking the east side of the Storehouse

LT2.2. Provide universally accessible parking for two vehicles west of the Entry Drive Allée.

a. Construct 2 universally accessible parking spaces (18'x18' area) paved with crushed fines of limestone and add signs for accessible parking.

LT2.3. Install relocated National Historic Landmark commemorative plaque.

a. Relocate the National Historic Landmark commemorative plaque from north part of site near Trail to Bailly Homestead and Chellberg Farm Visitor Center Contact Station to a location to be determined. Suggested locations include the west side of the allée north of the Main House or in a low relief setting within a planting bed near the Main House. Maintain with periodic inspection and by prohibiting the storage of material like mulch on the marker.

LT2.4. Add water hydrant.

a. Add water hydrant along the new water line at the woodland edge west of the Entry Drive. See additional detail in Chapter 6: Site Utilities.

LT2.5. Preserve tree canopy of Landscape Treatment Zone 2.

a. Consider monitoring the all trees in Landscape Treatment Zone 2 by a certified arborist for hazard identification and pruning/treatment as necessary on a regular basis.

Landscape Treatment Zone 3

Landscape treatment zone 3 corresponds to the Orchard and Barnyard of the Farm LCA. This area contained fruit trees, farm buildings, and other features to support farm and residential operations during the period of significance. There are no extant features remaining in Zone 3 that contribute to the historic integrity of the property. It is recommended that specific facilities needed to support the future use of the property be added in this area.

Recommendations for this area include the addition of parking, a universally accessible building, vegetative screening, barrier-free pedestrian paths, and an orchard that reflects the historic use of the property.

Landscape Treatment Zone 3 Tasks are coded LT3.#, and locations are illustrated on Drawing Long Term Treatment Recommendation Drawings: Landscape.

LT3.1. Rehabilitate vegetative screening between Landscape Treatment Zones 1 and 3.
a. Install 2 shrub beds (1,040 sf) with northern white cedar (*Thuja occidentalis*) and other native deciduous species at the north end of the allée.

LT3.2. Add a universally accessible building for overnight accommodations (see Chapter 6).

LT3.3. Add native ornamental vegetation at the universally accessible building.
a. Install planting beds for native herbaceous plants on the north, west, and south sides of the building.

LT3.4. Repair the existing access drive.
a. Re-grade and shape the 230’ long access drive loop to provide positive drainage off the road; widen the access drive to 12’ width and provide 1’ wide shoulder clearance at both sides of road; and, pave with consolidated crushed fines of limestone or other locally available material that meets NPS standards for universal accessibility.

LT3.5. Add parking area with universally accessible parking.
a. Construct 10 (18’x9’) spaces including 1 universally accessible parking space paved with crushed fines of limestone and add signs for accessible parking.

LT3.6. Add trail connections between the universally accessible building, comfort station, and Little Calumet River Trail System (trail to Dunes Learning Center and trail to Chellberg Farm Visitor Center Contact Station).
a. Add 420’ long and 5’ wide walk paved with crushed fines of limestone to connect interpretive orchard, and walk at universally accessible building, and east side of parking drive loop.
b. Provide 120’ long and 5’ wide walk paved with crushed fines of limestone surface treatment for pedestrian route over 8’-wide base for segment between accessible parking and east-west Little Calumet River Trail connector to accommodate potential

use of small, four-wheeled vehicles. Vegetate with turf on sides of trail beyond pedestrian route.

c. Consider upgrade of Trail to Dunes Learning Center to provide secondary emergency access. This would require a comprehensive design process that would provide minimal modification of grades, expanded clear way, and a widened, compacted driving surface for vehicles for approximately 1,170 feet. A visible pedestrian route (trail) could be established over the driving surface with a vegetated surface treatment established for the sides of the trail and remainder of the driving surface.

LT3.7. Add comfort station.

a. Construct two-room comfort station between parking lot and trail to Dunes Learning Center. This area can be used to place portable toilets prior to construction of the comfort station.

LT3.8. Add overhead light.

a. Relocate one existing overhead light south of the parking area.

LT3.9. Add screen plantings for parking lot.

a. Add 4,280 sf of screen plantings of native trees and shrubs on the north and east sides of the parking lot.

LT3.10. Rehabilitate and interpret orchard (*discussed during Treatment Workshop).*

a. Option 1: Plant 8 disease-resistant, flowering trees such as sweet crabapple (*Malus coronaria*) or prairie crabapple (*Malus ioensis*) for interpretive orchard.

b. Option 2: Plant 8 disease-resistant, mixed fruit trees for interpretive orchard.

c. Option 3: Consider mechanical feasibility for installation of solar panel orchard in this location.

LT3.11. Add picnic area.

a. Construct a 8’x33’ universally accessible surface of crushed fines of limestone along the west side of the path between the parking area and the comfort station.

b. Add 3 picnic tables on the west side of the walk.

LT3.12. Preserve tree canopy of Landscape Treatment Zone 3.

a. Consider monitoring the all trees in Landscape Treatment Zone 3 by a certified arborist for hazard identification and pruning/treatment as necessary on a regular basis.

b. Repair visual permeability by reducing approximately 650 sf of woody vegetation from existing forest edge to promote orchard growth on the east edge of the plateau.

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Bailly Homestead, view looking northeast, ca. 1922. (INDU Museum Collection)

6 TREATMENT RECOMMENDATIONS
SITE UTILITIES

Chapter 6 | Site and Buildings Treatment Recommendations

Site Utilities
Long Term Treatment Recommendations

New site utilities will be required to support the proposed rehabilitation of the site and buildings. Refer to the Site Utilities Drawings at the end of this narrative.

Electrical

New electrical service will need to be provided to the site. Coordination with the electrical service provider, NIPSCO, will be required to determine if the existing transformer and service lateral are sufficient to support the increase electrical loads on the site. It is anticipated that the utility service equipment will need to be increased due to the increased load. The existing meter pedestal will need to be replaced with a larger (approximately 400A) meter, which will require the addition of a CT cabinet mounted adjacent to the meter on a unistrut frame. New service entrance conductors will be routed below grade in PVC conduit from the meter and CT cabinet location to a weatherproof wireway located adjacent to the south exterior wall of the brick house. A service disconnect (six total) for each building will be mounted just below the wireway. Conductors to each building will be routed from these disconnects below grade in PVC conduit to a service entrance rated load center located at each building. Preliminary approval from NIPSCO has been received to feed all of the structures on the site from a single meter, however if after further review of the site NIPSCO requires each building to be metered separately then an individual feed-through style meter will need to be installed for each building.

Cable/Data

New cable/data service will need to be brought to the site. Two options should be explored: (1) A new cable will be provided to provide data service while leaving the existing telephone cable in place or (2) the existing telephone cable will be replaced with new cable that will provide both telephone and data to the site. Coordination with the service provider (Verizon) will be required to determine which option is required and exact requirements. A new network switch will be installed in the basement of the main house to serve the data needs of the site.

Gas

Further coordination with the gas service provider, NIPSCO, will be required to determine if the existing gas meter and service pipes are adequately sized for the increased gas load on the site. Gas piping from the meter will be routed below grade in SDR11 High Density Polyethylene (HDPE) pipe and will be distributed to each building. The size of all gas lines will need to be determined after equipment selections have been made and design of the other systems has progressed. Preliminary approval from NIPSCO has been received to feed all of the structures on the site from a single meter, however if after further review of the site NIPSCO requires each building to be metered separately, then an individual meter will need to be installed for each building. Black steel piping will be used for all above grade natural gas piping within the buildings.

Sanitary Sewer

New sanitary sewer service will need to be provided to the site. A lift station will be required to pump the sanitary waste from the site. There is an existing 3-inch forced sewer main service line adjacent to the entrance to the Good Fellow Club Youth Camp (Good Fellow) site on the east side of Howe Road, approximately 1200' from the entrance to the Bailly Homestead site. This is where the waste from the site will need to be pumped to. If gravity-fed, a 3-inch sewer main is not sufficient to serve the entire Bailly Homestead site if fully developed with overnight accommodations and increased usage. If a forced main is utilized as proposed to the lift station, tank and pumps would need to be sized appropriately to handle the demand of the site.

Domestic Water

New domestic water service will need to be provided to the site. There is an existing 12-inch municipal water service line adjacent to the entrance to the Good Fellow site on the west side of Howe Road. The existing below grade municipal water line will need to be extended approximately 1200' to reach the entrance to the Bailly Homestead site. A 2-inch water line should be tapped from the main line and routed to a new water meter that would be set adjacent to the entry drive. From the water meter a 2-inch water line would be extended below grade to the basement of the brick house (HS-19). If allowed by the Authority Having Jurisdiction, a combined water and fire service entry may be provided. The service would be split at the point of entry into the brick house.

Due to inadequate available water pressure and flow, a booster pump will be required to serve the domestic water needs of the site. The booster pump will need to be located in the basement of the brick house. The 2-inch water line will enter the basement of the brick house and go through a backflow preventer prior to entering the booster pump. After exiting the booster pump the water service will be distributed to each building as needed. All below grade water distribution will be through Type K copper pipe. A fire line with hydrant will also need to be provided. A centralized hydrant cannot exceed six hundred feet from the furthest building it will serve.

Fire Sprinkler / Fire Service

New fire sprinkler water service will need to be provided to the site. A 4-inch water line should be tapped from the municipal water line near the entry drive and routed below grade to the basement of the brick house (HS-19). If allowed by the Authority Having Jurisdiction, a combined water and fire service entry may be provided. The services would be split at the point of entry into the brick house. Due to inadequate available water pressure and flow a fire pump will be required to serve the fire sprinkler system. This fire pump will need to be located in the basement of the brick house. The 4-inch water line will enter the basement of the brick house and go through a backflow preventer prior to entering the fire pump. After exiting the fire pump the water will be distributed to the other structures. If fire and domestic water lines are combined, then the meter will need to be located at the building as opposed to down by the entry drive. The fire riser in each building will have a drain down point for testing and maintenance. This could be used to drain and refill the system to keep the water from getting stagnant. A new fire service line and hydrant is proposed to be installed

Site Lighting

It is recommended that the existing site lighting fixtures be replaced with new more energy efficient LED fixtures mounted to new steel poles. The existing below grade conduit and conductors should be tested and replaced as needed.

New pedestrian scale light fixtures are recommended for lighting the pathway between the Bailly Homestead site and the remote parking lot located to the northwest.

Solar

Consider installation of solar field in the open green space where the historic orchard once stood.

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CULTURAL LANDSCAPE AND HISTORIC STRUCTURES REPORT

BAILLY HOMESTEAD

INDIANA DUNES NATIONAL LAKESHORE

TREATMENT RECOMMENDATIONS

PORTER, INDIANA



HS–18 MAIN HOUSE (STRATA 2017)

INDEX OF DRAWINGS

00 COVER
SU–1 SITE UTILITIES PLAN
SU–2 SITE UTILITIES ENLARGED PLAN

HS–18 MAIN HOUSE
ARCHITECTURAL
A0 BASEMENT DEMOLITION FLOOR PLAN
A1 BASEMENT FLOOR PLAN
A2 FIRST DEMOLITION FLOOR PLAN
A3 FIRST FLOOR PLAN
A4 SECOND DEMOLITION FLOOR PLAN
A5 SECOND FLOOR PLAN
A6 THIRD DEMOLITION FLOOR PLAN
A7 THIRD FLOOR PLAN
A8 ROOF PLAN
A9 ELEVATION
A10 ELEVATION
A11 ELEVATION
A12 ELEVATION

STRUCTURAL
S1 FIRST FLOOR FRAMING PLAN & DETAILS
S2 SECOND FLOOR FRAMING PLAN & DETAILS
S3 THIRD FLOOR FRAMING PLAN AND DETAILS

MECHANICAL
M1 BASEMENT FLOOR PLAN
M2 FIRST FLOOR PLAN
M3 SECOND FLOOR PLAN
M4 THIRD FLOOR PLAN

HS–19 BRICK HOUSE
ARCHITECTURAL
A13 FLOOR PLANS – OPTION 1
A14 FLOOR PLANS – OPTION 2
A15 ELEVATIONS
A16 ELEVATIONS
A17 ELEVATIONS
A18 ELEVATIONS

STRUCTURAL
S4 FLOOR PLANS

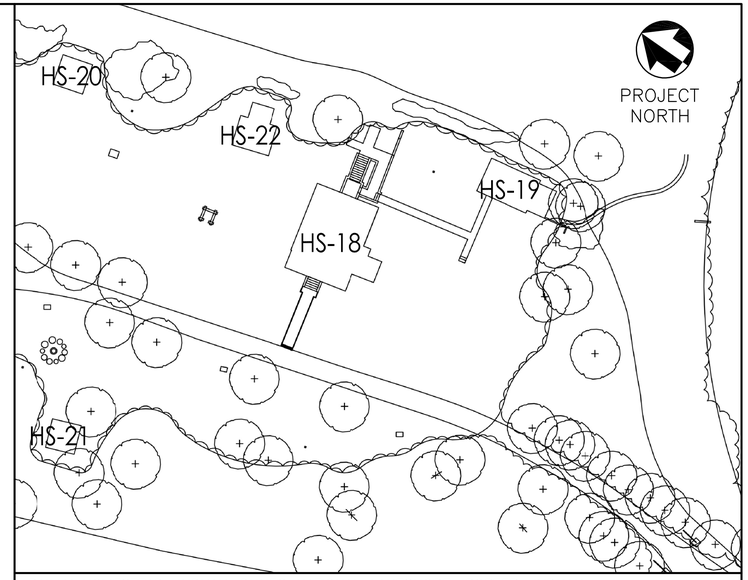
HS–20 TWO–STORY LOG HOUSE
ARCHITECTURAL
A19 CRAWL SPACE PLAN
A20 FIRST FLOOR PLAN
A21 SECOND FLOOR PLAN
A22 ELEVATION
A23 ELEVATION
A24 ELEVATION
A25 ELEVATION

STRUCTURAL
S5 BUILDING SECTION

HS–21 STOREHOUSE
ARCHITECTURAL
A26 FIRST FLOOR AND ROOF PLANS
A27 ELEVATIONS

HS–22 CHAPEL
ARCHITECTURAL
A28 CRAWL SPACE PLAN
A29 FIRST FLOOR PLAN
A30 ROOF PLAN
A31 ELEVATION
A32 ELEVATION
A33 ELEVATION
A34 ELEVATION

ADA PROPOSED UNIT
A35 PROPOSED FIRST FLOOR PLAN



BAILLY HOMESTEAD, INDIANA DUNES NATIONAL LAKESHORE, PORTER, INDIANA

IMMEDIATE TREATMENT GENERAL NOTES:

- CLEAN OUT BUILDING TO PROVIDE CLEAR VIEW AND ACCESS FOR MAINTENANCE AND INSPECTIONS.
- REMOVAL OF ALL WASPS AND PESTS. AN ENORMOUS WASP NEST WAS FORMED IN THE SECOND FLOOR WINDOW 205 DURING THE AUGUST 2017 VISIT. ADDITIONAL WASP NESTS WERE STARTING TO FORM IN OPEN WINDOWS.
- COMPLETELY CLOSE ALL DOUBLE–HUNG WINDOWS. MANY OF THE WINDOWS DO NOT SHUT PROPERLY AND ARE NOT LOCKED OR ABLE TO BE LOCKED. THESE NEED TO BE CLOSED, AND IF NO SASH LOCKS EXIST, INSTALL A BOARD UNDER THE MEETING RAIL TO HOLD THE UPPER SASH IN PLACE. THIS IS PREVALENT THROUGHOUT THE BUILDING. PLUG HOLES IN WINDOWS. THE LEADED GLASS WINDOW IN THE CONSERVATORY HAS A HOLE, AS DOES THE PLEXI GLASS WINDOW 009 IN THE BASEMENT. CHECK THAT ALL WINDOWS ARE WELL SEALED. THIS WILL PREVENT PEST INFESTATION AND INTRODUCTION OF MOISTURE, AS WELL AS INCREASE SAFETY.

STRUCTURAL:

- RESTRICT PUBLIC ACCESS TO THE SECOND FLOOR AND HIGHER. FRAMING AT STAIRS NOT ADEQUATE FOR LOAD CARRYING CAPACITY OF ANY KIND. INSTALL TEMPORARY SHORING AT FRAMING AROUND STAIRS TO THE SECOND FLOOR. SHORING SHOULD CONTINUE TO BASEMENT SLAB.
- ROOF FRAMING IS DETERIORATED AND HAS BEEN SUPPLEMENTED WITH UNCONVENTIONAL FRAMING.
  - INSTALL TEMPORARY SHORING BENEATH BOTH VALLEY RAFTERS.
  - INSTALL BLOCKING AND HURRICANE STRAPS TO EXISTING KNEE WALL AT NW CORNER OF HOUSE.
  - IN ROOM 304 AT WEST WALL, INSTALL SHORING POST OVER BLOCKING TO DISTRIBUTE LOAD OVER MIN. 2 BEAMS. CONTINUE SHORING IN SAME LOCATION AT EACH FLOOR DOWN TO BASEMENT SLAB.
  - IN ROOM 300 AT SOUTH WALL AND ROOM 301 WEST WALL, INSTALL POSTS WITH SIMILAR BLOCKING AND SHORE TO BASEMENT.
- RESTRICT ACCESS TO THE SECOND STORY PORCHES. THE RAILINGS ARE DETERIORATED AND UNSTABLE.

MECHANICAL:

- FOR CONTINUED USE OF THE EXISTING FURNACE AND DUCTWORK, INSPECT ALL EQUIPMENT, CLEAN, AND REPAIR OR REPLACE, AS REQUIRED.

ELECTRICAL:

- LICENSED ELECTRICIAN SHOULD VISUALLY INSPECT EXISTING SERVICE FOR DAMAGED DEVISED AND B RANCH CIRCUIT CONDUCTORS. BRANCH CIRCUITS AND SERVICE ENTRANCE CONDUCTORS SHOULD BE MEGGER TESTED AND REPAIRS MADE, AS REQUIRED.
- LICENSED ELECTRICIAN SHOULD REVIEW EXISTING GROUNDING SYSTEM, PER NEC ARTICLE 250, AND MODIFICATIONS SHOULD BE MADE, AS REQUIRED.

ROOFING:

- PERFORM MAINTENANCE FOR WOOD SHINGLE ROOF. REPAIR/REPLACE DETERIORATED, BROKEN, OR MISSING SHINGLES TO MATCH IN KIND. INSPECT AND REPAIR FLASHINGS, AS WELL.
- EXISTING LIGHTNING PROTECTION SYSTEM SHOULD BE THOROUGHLY INSPECTED TO ENSURE ALL CONNECTIONS, CABLES, AND COMPONENTS ARE PROPERLY INSTALLED AND SECURE (PER UL MASTER LABEL CERTIFICATION REQUIREMENTS).
- CONDUCT A PEST INSPECTION. SPIDERS WERE FOUND THROUGHOUT THE HOUSE, AND ESPECIALLY IN THE BASEMENT. INSTALL TREATMENT ACCORDINGLY.

CULTURAL RESOURCES

- REMOVE ALL EXISTING HISTORIC ARTIFACTS AND ARCHITECTURAL COMPONENTS FROM THE HOUSE AND STORE OFF SITE. ITEMS STORED IN THE BASEMENT ARE DETERIORATING FROM MOISTURE. OTHER ITEMS MAY BE STOLEN OR ACCIDENTALLY THROWN AWAY.

SHORT TERM AND LONG TERM – GENERAL NOTES:

- CONDUCT SEASONAL MAINTENANCE INSPECTION OF THE INTERIOR AND EXTERIOR OF THE BUILDING.
- FUNCTIONALITY OF EXISTING INTRUSION DETECTION SYSTEM SHOULD BE VERIFIED.

MECHANICAL:

- THE EXISTING THERMOSTAT CONTAINS MERCURY AND SHOULD BE REMOVED AND CAREFULLY DISPOSED OF IN AN APPROVED MANNER. INSTALL NEW PROGRAMMABLE THERMOSTAT

LONG TERM MAINTENANCE AND PRESERVATION TREATMENT:

- ABATE LEAD BASED PAINT. QUANTITY AND EXTENT UNKNOWN AT THIS TIME. DEMOLISH ALL GYPSUM BOARD DRYWALL IN THE BASEMENT, AS WELL AS ALL NEW CONTEMPORARY WALLS.
- SELECTIVE DEMOLITION FOR INTERIOR AND EXTERIOR WORK IS REQUIRED, PER THE PLANS. CARE SHALL BE TAKEN TO AVOID DAMAGING HISTORIC FINISHES OR MATERIALS.
- ALL EXTERIOR REPLACEMENT TRIM TO BE TREATED WITH WOOD PRESERVATIVE ON ALL SURFACES AND ALL CUTS, PRIOR TO INSTALLATION.
- MONITOR 'LEAN' OF STRUCTURE TO THE SOUTH ON A BI–ANNUAL BASIS FOR CONTINUED MOVEMENT.

SANITARY:

- INSTALL NEW 4" SANITARY SERVICE TO THE BULDING AND DISTRIBUTE, AS REQUIRED.
- INSTALL A GREASE INTERCEPTOR FOR THE KITCHEN SINK.

MECHANICAL:

- REMOVE ALL EXISTING MECHANICAL HEATING SYSTEMS, DUCTWORK, AND ACCESSORIES FROM THE HOUSE.
- INSTALL NEW VRF OR HEAT PUMP CENTRAL HEATING AND COOLING SYSTEM THROUGHOUT THE HOUSE. COORDINATE LOCATIONS OF ALL PIPING AND GRATES WITH ARCHITECT.

PLUMBING:

- ALL EXISTING, UNUSED PLUMBING FIXTURES AND PIPING SYSTEMS SHOULD BE REMOVED FROM THE HOUSE IN THEIR ENTIRETY.
- INSTALL NEW PLUMBING DISTRIBUTION SERVICE THROUGHOUT THE HOUSE. ROUTING OF ALL PIPING TO BE CLOSELY COORDINATED WITH THE ARCHITECT.
- INSTALL DOMESTIC WATER SERVICE THROUGHOUT THE HOUSE, TO BE FED FROM BOOSTER PUMP IN BASEMENT OF BRICK HOUSE.

ELECTRICAL:

- INSTALL NEW 200 AMP SINGLE PHASE SERVICE IN MECHANICAL 003.
- INSTALL NEW GROUNDING SYSTEM AND CONNECT TO LIGHTNING PROTECTION SYSTEM.
- REMOVE ALL EXISTING ELECTRICAL DEVICES, BOXES, AND WIRING THAT IS NOT CONSIDERED TO BE HISTORIC, CANNOT BE SALVAGED, OR IS NOT CODE COMPLIANT. EXISTING HISTORIC FEATURES SUCH AS THE SURFACE MOUNTED WOOD RACEWAY, BRASS LAMP SOCKETS, AND PORCELAIN SOCKETS SHOULD BE RETAINED.
- INSTALL NEW POWER AND LIGHTING BRANCH CIRCUIT WIRING THROUGHOUT BUILDING.
- INSTALL LED EXIST SIGNAGE AND EMERGENCY LIGHTING IN PATH OF EGRESS.
- INSTALL NEW NETWORK SWITCH IN BASEMENT FOR WIRELESS ACCESS POINTS.
- INSTALL NEW DATA/CABLE/TELEPHONE WIRING.

GAS SERVICE:

- REMOVE ALL EXISTING GAS SERVICE, PIPING, AND ACCESSORIES THROUGHOUT THE HOUSE.
- INSTALL NEW NATURAL GAS SERVICE TO THE HOUSE.
- INSTALL GAS SERVICE TO THE FOLLOWING APPLIANCES: KITCHEN STOVE; FIREPLACE IN BASEMENT; AND FIREPLACE IN PARLOR.

FIRE PROTECTION:

- REMOVE ALL OF THE EXISTING FIRE ALARM SYSTEM IN ITS ENTIRETY.
- INSTALL NEW FIRE ALARM SYSTEM TO PROVIDE NOTIFICATION. PROVIDE CONNECTION TO THE KITCHEN HOOD TO MONITOR THE ANSUL SYSTEM.
- INSTALL NEW AUTOMATED FIRE SPRINKLER SYSTEM TO COMPLY WITH NPS REQUIREMENTS. WET SYSTEM TO BE FED FROM FIRE PUMP IN BASEMENT OF BRICK HOUSE. ROUTING OF ALL PIPES TO BE CLOSELY COORDINATED WITH THE ARCHITECT TO MINIMIZE IMPACT ON THE BUILDING.

CULTURAL LANDSCAPE AND HISTORIC STRUCTURES REPORT

UNITED STATES DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE
DENVER SERVICE CENTER

TITLE OF PROJECT

TREATMENT RECOMMENDATIONS

BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE

REGION	COUNTY	STATE
MIDWEST	PORTER	INDIANA

DRAWING NO. 626 138617

PMIS/PKG NO. 20940

SHEET 1 OF 48



1 SITE UTILITIES OVERALL PLAN
SCALE: 1/128"=1'-0"

N

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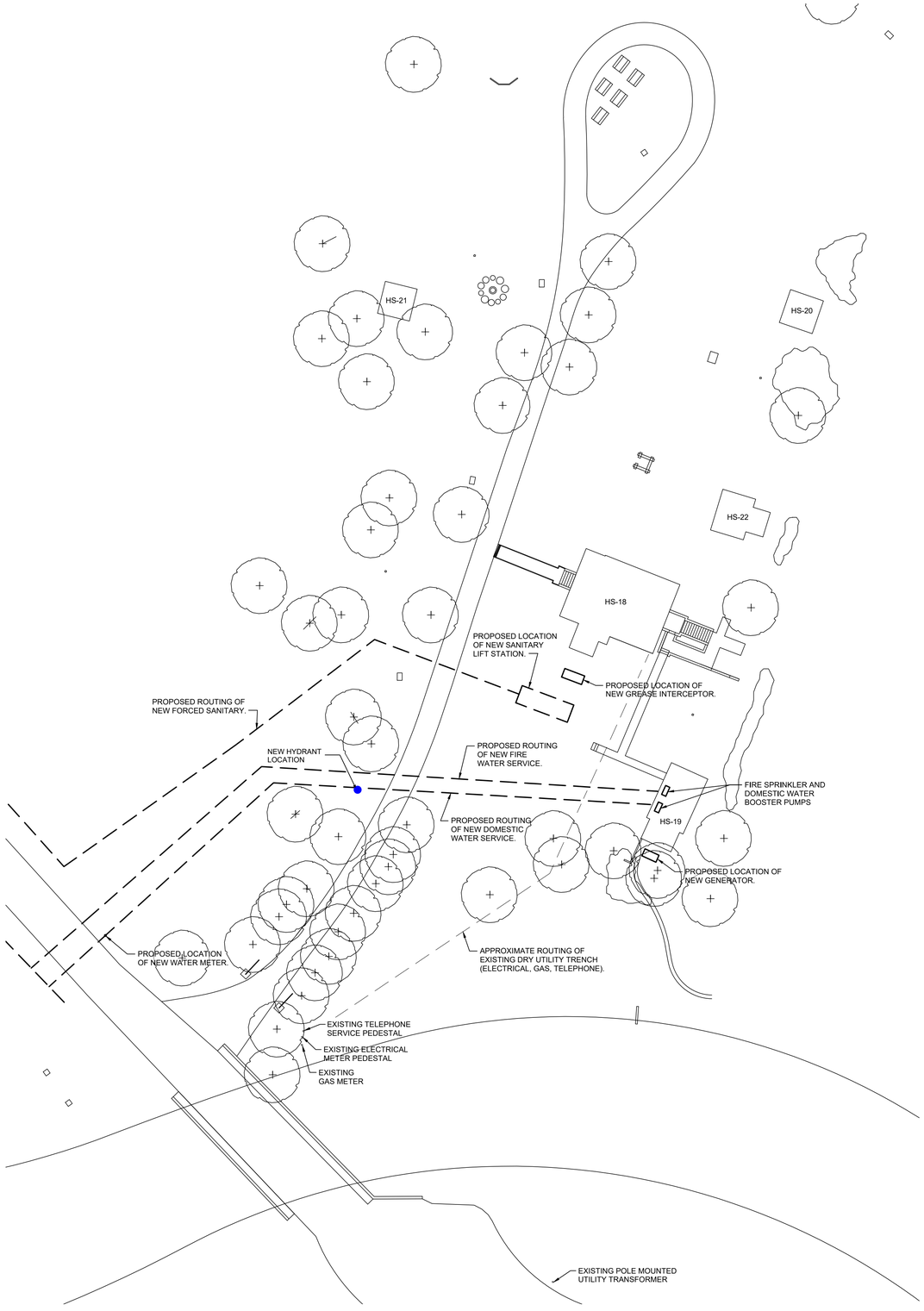
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TECH. REVIEW: HEI
DATE: 05/07/2018

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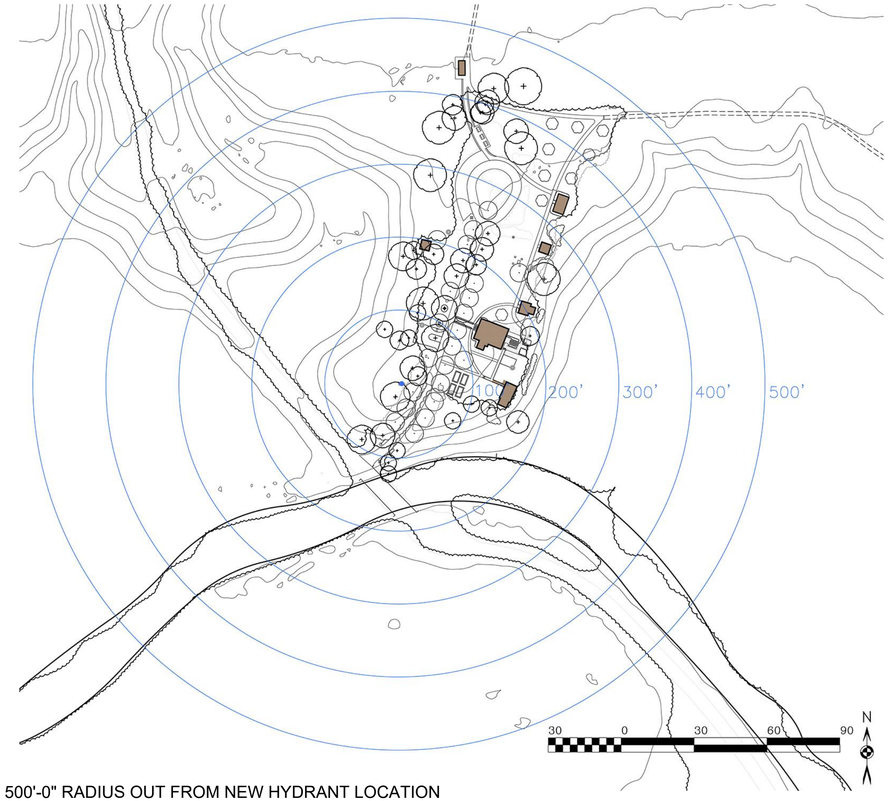
TITLE OF SHEET
TREATMENT RECOMMENDATIONS
SITE UTILITIES

BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 2 OF 48



1 SITE UTILITIES ENLARGED PLAN
SCALE: 1/32"=1'-0"



500'-0" RADIUS OUT FROM NEW HYDRANT LOCATION

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SUB SHEET NO. T SU2

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
SITE UTILITIES

BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
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SHEET 3 OF 48



Main House West Elevation. (1924 Album, INDU Museum Collection, and Nelson, "Miss Frances R. Howe and the Bailly Homestead As I Knew Them in 1904," Bailly Vertical File, WTHM, 2.)

6 TREATMENT RECOMMENDATIONS
MAIN HOUSE

Main House (HS-18) Treatment Recommendations

Treatment plans and elevations for the Main House can be found following this narrative.



Figure 6.1. View of HS-18 Main House, West elevation. (STRATA 2017)

The Main House HS-18 was originally constructed ca. 1834-1835. The house underwent a major transformation ca. 1900 that transformed it into a picturesque Late Victorian home (Figure 6.1). The house has not been occupied for at least 46 years, is not habitable in its current condition, and has no current water or sanitary services. The house has been consistently open for organized tours on weekends during set times of the year.

The house is in fair condition overall and retains a high level of significant character defining features. This structure is integral to telling the story of the Bailly family and homestead, having been the center of the Bailly Homestead for nearly one hundred eighty-three years. The period of significance for the Bailly Homestead is 1918, which is the last year the house and property were owned by the Bailly family.

Treatment Considerations

While the exterior of the house was fairly well documented photographically, the interior was not. There are gaps in the knowledge of how portions of the early house were configured and how the spaces functioned. There is no documentation with regards to interior modifications made to bring it to its current state, save for a few notes on some historic photographs and the book written by Frances Howe. Interior photographs from the period of significance do not exist or have not been found to date.

The Main House plays the most critical role in the rehabilitation of the site and adjacent buildings. The consensus from the Treatment Alternatives Workshop was to rehabilitate the house for it to function as overnight accommodations and to provide kitchen services for guests, as well as a potential catering 'warming' kitchen. The kitchen could also be used as a potential demonstration kitchen for small groups. The house must retain its significant historic features and its interpretive value.

To fulfill this vision, the house must undergo significant interior and exterior rehabilitation. Identifying an appropriate historic treatment approach for the house is important to serve as a guideline for planning and design purposes. The potential treatment approaches were introduced and discussed previously in Chapter 5. Of the four options (Preservation, Restoration, Rehabilitation, and Reconstruction), ***Rehabilitation*** was selected as the treatment approach to meet the requirements for this overall project. Rehabilitation of the structure will allow for its maintenance, preservation, and accommodation of twenty-first century conveniences while preserving its most important significant historic features.

Both options require complete exterior and interior building rehabilitation, including abatement (LBP and ACM); masonry and window restoration; roofing replacement and underlayment abatement (future); new electrical service; new mechanical services; new fire alarm and fire suppression systems; restored significant finishes; and new restroom accommodations.

Exterior Historic Treatment Approach

The exterior of the house is in overall fair condition. While the interior of the house requires upgrades and renovation for it to be utilized for overnight night accommodations to provide site services, the exterior of the house requires less involved treatment work. The exterior will require modifications to less visible areas to accommodate ADA accessibility for the site around the house and into the lower level of the house. This will require some re-grading and construction of new site walls, ramps, and steps at the rear (east side) of the house. The exterior of the house requires overall maintenance, including: repointing; window and door restoration; re-roofing (coordinated with abatement); roof re-structuring; deteriorated wood replacement; installation of handrails; waterproofing the foundation, and new electrical and lighting services and distribution.

Interior Historic Treatment Approach

The interior of the house is in overall fair to poor condition and is not functional in its current condition due to structural, hazardous materials, and general deterioration. Modern amenities will need to be installed to rehabilitate the interior of the house for visitor services and overnight accommodations. While principal interior spaces remain relatively intact, the lack of details from the period of significance precludes any type of restoration of the spaces. Rooms throughout the house have suffered from removal or deterioration of historic finishes, and some features have been altered.

Rehabilitation of the house will include: new utility services; ADA accessibility; new HVAC and electrical systems and distribution; fire suppression system; restoration and rehabilitation of all

significant interior finishes; installation of restrooms and bathrooms; and installation of visitor-required services, such as a kitchen, laundry facilities, and dining area.

Preservation Zones

To guide the proposed rehabilitation of the interior of the house, Preservation Zones were established to identify the level of integrity associated with the period of significance (1918) for each space. These areas were identified to provide a basis for the proposed rehabilitation work, so that the more significant spaces with the most integrity are protected, and spaces with less integrity are utilized for the functions that require the most alterations. The interior of the house was evaluated based on the current conditions and integrity within each space. These recommendations should serve as a checkpoint for all work to the house. There are exceptions to these recommendations only when life/safety is at risk, such as required structural modifications, installation of fire suppression systems, and similar scope of work.



Figure 6.2. Preservation Treatment Zones – Main House HS-18. (STRATA 2017)

Three levels of Preservation Zones were identified (Figure 6.2):

Preservation Zone 1 (Red) – Highest Integrity – Retains overall form or layout and a majority of the architectural materials from the period of significance.
Only changes that will not affect the historic fabric may be proposed in this area.

Preservation Zone 2 (Blue) – Mid-level Integrity – Retains original overall form or layout and some of the architectural materials from the period of significance. Other modifications or previous renovations that do not detract from the space may have occurred outside of the period of significance.
Only changes that will not affect the historic fabric may be proposed in this area. Minor and sensitive modern intrusions, such as lighting and alarms can be added.

Preservation Zone 3 (Green) – Low Integrity – Retains no or very little integrity, except potentially the surrounding walls and deteriorated finishes.
Changes may be proposed in this area, as long as any identified materials that are significant from the period of significance are retained or in the very least documented.

The retention of historic materials is of the utmost importance for any proposed rehabilitation work to the property. Rehabilitation work which affects historic materials, through alteration or removal due to construction, should be thoughtfully considered. The removal of significant features or materials during construction should be closely coordinated with qualified NPS staff to ensure the cataloguing and preservation of the materials in the park collection. Prior to any work, and regularly throughout construction, the interior and exterior of the house should be thoroughly photographed for park records. Close attention should be paid to documenting the areas that are currently not visible, such as the structure between floors and ceilings, behind finishes on walls, and any other openings and repair work that will not be visible after construction. This documentation will be invaluable for understanding the building and its changes in the future.

Hazardous Materials

Before work can begin, all hazardous materials should be abated and removed from the project site. Materials testing by Terracon in June of 2017 indicated the presence of lead and asbestos-containing materials on both the exterior and interior of the house. These are identified in Appendix G. While a variety of samples were taken, this was a limited testing report and did not cover all materials and surfaces throughout the interior and exterior of the house. Therefore, additional sampling may be required to determine the final quantities and scope of removal work, specifically noted for the textured finishes applied to the walls and ceilings.

Summaries of LBP and ACM materials found are included in the Existing Conditions section of each building. All removal methodologies and materials should be approved by the National Park Service, prior to the start of any work. Tests for paint removal products should be conducted, offering a variety of removal mediums. The selected removal product must not affect the historic materials and must be able to be completely removed so that compatibility with new

coatings will not be an issue. A wide variety of wallpaper and paint sampling should be done by an experienced professional throughout the interior and exterior of the house, prior to the removal of the paint. These samples should be taken in great quantity and should be carefully catalogued and stored in the park archives. Once the finishes are removed, the evidence of historic wallpaper and paint layers will no longer be present. Having access to these samples may assist with analysis for future interior and exterior interpretation.

Construction Impact
All construction activities are required to go through the Section 106 review. All construction activities that may impact the grading or soils surrounding the house or in the basement may be required to be closely coordinated with the Midwest Archeological Center (MWAC). The Archeological advisor must consult and provide recommendations for how to avoid, protect, or mitigate archeological resource impacts. No demolition, excavation or digging can occur without the required notifications, approvals, and documentation.

Rehabilitation Program

The Main House is proposed to be converted into overnight accommodations and visitor support services. The first, second, and third floors of the house cannot be made ADA accessible without major alterations that were not found to be acceptable, due to the small floor plate of the house and the multiple levels, especially at the first floor level. According to the International Building Code (IBC), Section 1107.6.2.1.1, only establishments that have greater than twenty units are required to provide an ADA accessible unit. However, the workshop attendees agreed, that it would be a disservice to the public to not provide at least one accessible overnight accommodation. ADA accommodation will be made into the basement, which will serve as the primary visitor support services, and a separate overnight ADA unit providing overnight accommodations would be constructed as part of the Bailly Homestead. The drawing showing the basic unit size for such a unit can be found at the end of Chapter 6.

Functions within the Main House include:

First Floor

- Living and dining spaces for visitor use and functions. Front and back porches for visitor use.

Second Floor and Third Floors

- Five total bedrooms with individual, attached bathrooms.

Basement (ADA Accessible)

- Multi-use kitchen: used to prepare breakfast for overnight guests; for demonstration classes; for warming kitchen for catered events on the grounds
- ADA accessible restroom
- Laundry for the overnight accommodations in all buildings
- Pantry
- Mechanical and support spaces

In addition to the Main House, the Two-Story Log House and potentially the Brick House will be converted into overnight accommodations. With five bedrooms in the house, the Two-Story Log House, the Brick House, and a separate new ADA unit, there would be a total of eight overnight accommodation 'rooms' available. The Main House would serve as the core for all visitor services.

The proposed Scope of Work and Treatment Recommendations are found below. Treatment drawings follow this section.

Architectural and Structural Recommendations

Immediate Treatment Recommendations - *Maintenance and Preservation*

Refer to the Cost Estimate for Immediate Treatment Recommendations in Appendix K.

1) Clean out building to provide clear view and access for maintenance and inspections.
2) Removal of all wasps and pests. An enormous wasp nest was formed in the second floor Window 205 during the August 2017 visit. Additional wasp nests were starting to form in open windows.
3) Conduct a pest inspection. Spiders were found throughout the house, especially in the basement. Install treatment accordingly.
4) Completely close all double-hung windows. Many of the windows do not shut properly and are not locked or able to be locked. These need to be closed, and if no sash locks exist, install a board under the meeting rail to hold the upper sash in place. This is prevalent throughout the building. Plug holes in windows. The leaded glass window in the conservatory has a hole, as does the plexi-glass Window 009 in the basement. Check that all windows are well sealed. This will prevent pest infestation and introduction of moisture, as well as increase security.

Structural:

5) Do not allow public to access second floor and higher.
   Based on observations and calculations, the second floor structural framing does not have adequate load carrying capacity for occupancy of any kind. The framing around the stairs does not have a direct load path to the foundation. The framing around the stairs to the second floor should have temporary shoring installed. The shoring should continue down to the basement slab. Public access to the second floor or higher should be restricted.
6) Roof framing is deteriorated and has been supplemented with unconventional framing. The roof framing has deterioration from moisture as well as damage from a previous fire. The existing roof framing consists of deteriorated wood members, damaged wood and new framing resulting in an unconventional framing system. Temporary shoring should be installed beneath both valley rafters. The north valley rafter should also have blocking and hurricane straps installed to securely connect the rafter to the existing knee wall near the northwest corner of the house. At the north valley rafter in Room 304, a shoring post should be located against the west wall and securely fastened to the valley rafter. At the base of the post on the third floor, blocking should be positioned in order to

distribute the load to at least two existing hewn timbers, spaced approximately at 3-feet on center, spanning east to west. The shoring should continue in the same location at each floor down to the basement slab. The south valley rafter also needs shoring posts installed in two locations. One post should be securely fastened to the rafter at the south wall in Room 300, and another post should be securely fastened to the rafter at the west wall of Room 301. As with the shoring for the north rafter, the shoring here should also feature blocking on the floor and continue in the same location at each floor down to the basement slab.

7) Restrict access to the second story porches. The railings are deteriorated and unstable.

Mechanical:

8) For continued use of the existing furnace and ductwork, inspect all equipment, clean, and repair or replace, as required.

Electrical:

9) A licensed electrician should visually inspect existing service for damaged devises and branch circuit conductors. Branch circuits and service entrance conductors should be megger tested and repairs made, as required.
10) A licensed electrician should review existing grounding system, per NEC article 250, and modifications should be made, as required.

Roofing:

11) Perform maintenance for wood shingle roof. Repair/replace deteriorated, broken, or missing shingles to match in kind. Inspect and repair flashings, as well.
12) Existing lightning protection system should be thoroughly inspected to ensure all connections, cables, and components are properly installed and secure (per UL master label certification requirements).

Cultural Resources:

Miscellaneous

13) Remove all existing loose historic artifacts and architectural components from the house and store off site in the park's museum collection. These items are not likely to be reused in a future rehabilitation but were kept from previous restoration projects as a record. Items stored in the basement are deteriorating from moisture. Other items may be stolen or accidentally thrown away.

Short Term Treatment Recommendations - *Maintenance and Preservation*

Refer to the Cost Estimate for Short Term Treatment Recommendations in Appendix K.

1) Conduct a seasonal maintenance inspection of the interior and exterior of the building. Regular inspections will ensure that deficiencies are noted and addressed promptly, alleviating further damage or deterioration.
2) The existing thermostat contains mercury and should be removed and carefully disposed of in an approved manner. Install new programmable thermostat.

Long Term Treatment Recommendations - *Rehabilitation*

Refer to the Cost Estimate for Long Term Treatment Recommendations in Appendix K.

General:

- Hazardous Materials Abatement:
  Perform hazardous materials abatement throughout the house, per the 2017 report completed by Terracon. This includes removal of asbestos containing materials and lead based paint materials.
- Conduct selective demolition for interior and exterior work, as required per the plans. Care shall be taken to avoid damaging historic finishes or materials.
- Treat all exterior replacement trim with wood preservative on all surfaces and all cuts, prior to installation.
- Monitor 'lean' of structure to the south on a bi-annual basis for continued movement.
- Utilize all duct chases for new piping and electrical conduit

Structural:

Foundation:

1) The stone foundation walls have open joints and evidence of mortar washout. The stone walls should have miscellaneous repointing performed on the exterior and interior. Some protection from continued mortar washout can be afforded by properly flashing and sealing the basement windows.
2) It is unknown if there is any existing subgrade drainage system installed around the house. Installation of a perimeter French drain and waterproofing on the exterior of the foundation wall below grade is recommended. The face of the stone foundation wall should be coated with a low strength cementitious parge coat. Bentonite waterproofing sheets should be applied to the face of the parge coat with a protection board. An open graded crushed stone rock chimney should be backfilled against the bentonite sheets and should be wrapped in filter fabric. The balance of the backfill can consist of soil. Soil should be compacted to 95% of a standard proctor (ASTM D-698). A footing drain should be incorporated into the "rock chimney" and daylighted at a lower elevation on the property. Backfill should be performed with light equipment and in such a manner to ensure compaction without imparting excessive force on the masonry walls. Incorporate downspout drainage boots into a higher solid PVC pipe within the rock chimney, also daylighted at a higher elevation towards the ravine.
3) The doorway into Room 002 does not have a lintel. Install a new steel lintel at this location.
4) The brick fireplace at the northwest corner of the basement has deterioration due to corrosion of the lintel over the fireplace opening. Replace the steel lintel and all fractured bricks.
5) Where Room 006 has a crack in the slab and open joints in the wall above, perform underpinning or mudjacking. Additionally, repoint the open mortar joints in the wall above.

6) The stairs of the east porch appear to allow for water intrusion. Seal the cove joint between the steps and the CMU walls with joint sealant and backer rod and install weeps in the head joints of the CMU walls near the base on either side of the stairs.

First Floor Framing:

7) The International Building Code (IBC) in table 1607.1 *Minimum Uniformly Distributed Live Loads…* identifies loads for hotels and multifamily dwellings. The minimum for residential occupancy is 40 psf. For public rooms and corridors serving them, the required live load capacity is 100 psf. The future use of the structure has been identified potentially as overnight accommodations. The first floor would fall into the category requiring 100 psf. Rooms 101 and 104 currently have a calculated floor live load capacity of 63 psf, provided that all existing joists are in good condition. This is based on the current spans with three steel beams in place below the joists. In order to increase the live load capacity of the first floor to 100 psf, the existing joists should be supplemented with engineered wood products such as LVL or wood joists. These would be spaced at 16-inches on center. The size of these members would depend on the amount of headroom that is considered acceptable and if any of the existing steel beams are to be removed. It appears that two beams may be removed without harming the structural integrity of the house, but no beams may be removed until further investigation is performed on the existing framing. The joists must be completely exposed to fully determine the support requirements. In order to support the upper floors, the northernmost beam should not be removed.
8) The joists below the west porch are 2-inch by 10-inch spaced at 12-inches on center. The stamp on the edge of the joists reads “Kiln dried fir and larch”. If these are assumed to be Douglas Fir-Larch, No. 2 or better, the porch has a live load capacity in excess of 100 psf.
9) Prior to inspection and construction of first floor framing, asbestos abatement of the basement ceiling finishes will be required.

Second Floor Framing:

10) The framing above Room 104 has a calculated floor live load capacity of negative 6 psf. The reason for a negative result is the application of a modern analysis and code to a wood type that likely has greater strength values than what is published and produced today. Over the years the methods of calculating capacity has changed several times along with the level of conservatism. The tests performed to establish published strength values for species used in building materials have changed. The actual strength of particular species has also changed, due to changes in methods of growing, milling, and treating lumber. The trees grown today for building materials conform to established and tested properties. The properties of the same trees harvested from old growth forests nearly two centuries ago may have exceeded those of today. With the framing layout that has been constructed, the timbers do not have the capacity to carry loads based on today’s code application. In order to achieve a reasonable load carrying capacity, the span of the existing timbers must be reduced. For private rooms and corridors serving them, the IBC requires 40 psf. The span for the timbers must be reduced to 8-feet or

less, provided they are in good condition. This can be done with two W6x15 wide flange or two HSS6x6x1/4 tube steel beams. These beams may be installed snug to the bottom of the existing exposed framing with the use of shims. The steel may then be covered with wood paneling.

11) Where the existing timbers have split in Room 104, they must be treated with a wood consolidant. Installing wood screws vertically through the timbers, full depth, should also be used to minimize the size of the horizontal splits. The screw heads can then be hidden using wood plugs.
12) The framing above Room 101 has steel beams running north south which reduces the span of the timbers running east west. In order to support the 40 psf live load, these beams must be at least W8x21 members made of A992 steel. The two beams currently in place may not be this size and may also be too short for planned changes to the framing. They will likely need to be replaced, and the replacement beams will be located above the finish ceiling. The condition of the existing wood beams and joists in this area could not be verified. If they are exposed and found to be deteriorated or otherwise damaged, additional joist framing would need to be installed.
13) The additional steel beams mentioned in the previous two bullet points may be supported by the exterior log walls if the walls are notched. The beams will be supported in the middle of the house by steel posts. Ideally, the beams in the south half of the house and in the north half of the house should line up and meet over the same points. This will likely not be the case for all beams, and a total of three posts will be needed. The posts will be installed inside the central divider wall. This wall is located directly above the northernmost basement beam. The posts should continue below the basement beam to the basement slab where new footings will be required. Stiffener plates will be required between the flanges of the existing beam where the posts will be located.

Third Floor Framing:

14) Similar to the second floor framing, the third floor framing does not have adequate capacity to support the required live loads. The third floor should utilize steel beams and posts to reduce the spans of the existing timber framing. A central beam running east and west should be located directly above the one at the first floor framing level. Interior posts for the central beam should be located directly over the two posts in the basement to create a direct load path to the foundation.
15) The rotted east west timber visible above the stairs in Room 200 will require new joists to be installed on either side. It is also possible that more, if not all the timbers for the third floor framing have this rotted condition and require replacement or additional framing. This will not be known until all of the existing framing can be exposed.
16) The exposed framing in Room 201 is to be retained for the future intended use of the structure. It is recommended that a steel beam be installed in the wall between Room 201 and Room 202, reducing the span of the existing timbers. This will leave the existing framing with a calculated live load capacity of 25 psf, provided the timbers are in good condition. At least one of the existing timbers has rotted where it is pocketed into the exterior wall. Additional framing will be required for this room to support the third floor.

New joists will need to be installed between the existing timbers, at 3-feet on center. Since the existing ceiling is not level, the joists will need to be shimmed or stripped along the top to fit snug. The rotted timber will also need a new joist installed directly adjacent to it, as it cannot be relied upon to carry any loads in its current condition. As an alternative, the timber could have the bearing end replaced with a new hand-hewn timber and a scarf joint connection, or the entire timber could be replaced.

Roof Framing:

17) The existing roof framing has deteriorated and burned members. It is also composed of two different roof framing systems that are tied together in places. The older roof framing is burned and sagging and the newer roof is built over the top of it. Several options may be considered for the roof framing:
    a. Roof Stabilization – The roof is supported incidentally in part by interior, non-structural walls. This is the case for the valley rafters and several members of the old roof. In order to stabilize the roof, loads going to these interior walls must be re-directed to exterior walls. The planned layout of the third floor also has some of the interior walls slated for removal. The only way to then re-direct the loads will be to remove the existing roof rafters completely. This would be a delicate process since many of these members are actively contributing to the structural stability of the roof, especially the valley rafters. Shoring would be required down to the basement slab for the entire roof. When new valley rafters are installed, they will need to be installed at a different angle and location than where they are now. Removal of some members may require demolition or repair of portions of the roof, itself. The complexity involved in stabilizing the existing roof may make the option unfeasible.
    b. Reframing/Replacement – The existing roof is not only framed unconventionally, it is framed improperly. The valley rafters are not in the correct location and the ridge beam is not supported at the ends. The knee walls on the west side of the main gable are not suited to resist thrust loads. These conditions may be alleviated somewhat easier by replacing the entire roof structure rather than by stabilizing the existing roof. This would need to be performed by a design build roofing contractor.
    c. Preserving Log Rafters – Some log rafters are still part of the structural system of the roof. Many are burned and blackened. Whichever option above is chosen, the log rafters may be incorporated into the new roof framing if desired. The logs may need to be cut or spliced. Since the condition or strength of the rafters is unknown at this time, it is recommended that the logs not be relied upon for structural support.

Interior Stairs:

18) The stairs leading from the basement to the first floor turn in the northeast corner of the house. A 4-inch square post at this location is split and should be replaced with a steel post with a new concrete footing in the basement slab.

19) The post from the first floor to the second floor at the stairs should be cut at the base to allow for a steel beam to support it. The beam would be on top of the flooring so that headspace in the stair would not be encroached upon. The beam would span from the exterior wall to the top of the new steel post going to the basement slab. This will also require modifications to one or more balusters. The top of the wood post requires a new plate at the top where the second floor framing is supported.
20) The stairs from the basement to the first floor have a stair tread that is uneven and presents a fall hazard. The stair should be shimmed or otherwise supported.
21) The stairs from the second floor to the third floor are reportedly "spongy." Additional interior stair stringers may be added or the existing stair stringers may be reinforced with a small steel angle.

Exterior:

22) The posts at the east and west porch have damage, reportedly caused by woodpecker. The damaged portions should be replaced or repaired using wood filler suitable for exterior applications or suitable Dutchman repairs.
23) The logs at the top of the house on the west side are rotted. These logs should be replaced in kind.
24) The railing on the east balcony is severely deteriorated and is unsafe. It should be replaced, in kind.

Architectural – Exterior:

Masonry:

25) Clean masonry and cast stone with gentlest means possible. Start cleaning samples with detergent and hot water scrubbing. Utilize chemicals as last resort.
26) Perform miscellaneous repointing to match the existing historic mortar. Match color, hardness, aggregate, and tooling pattern.
27) Repoint 100% of the cast stone walls and porch elements.
28) Replace damaged cast stone to match the existing units. If units are not severely damaged, they may be patched with a preservation mortar, colored and with aggregate to match the existing historic cast stone.
29) Northwest chimney above the roofline requires repointing. Install aluminum cap to be coordinated with venting for gas insert fireplace in basement.
30) South chimney requires repointing and mortar wash replacement. Replace bricks that are cracked or damaged. Coordinate installation of fire-rated exhaust ventilation flue liner and gas fireplace insert ventilation from the existing flues.

General Work:

31) Install flashing and sealant at basement windows.
32) Remove existing wood shingle roof. Coordinate removal with asbestos underlayment abatement. Coordinate with potential roof framing reconstruction. Install new wood shingle roof system. Ventilate, per code, and as required to gain adequate ventilation for rafters. Inspect and replace all flashings, as required. Remove and reinstall existing lightning protection. Ensure it is in working condition.

33) Clean and adjust existing gutters and downspouts. Replace, in kind, as required. Coordinate drainage with installation of new foundation drainage excavation.
34) Conservatory: consider re-framing and installation of reproduction glazed skylight, per the historic photographs.
35) Windows: rehabilitate all existing wood windows and related trim and hardware. Rehabilitation includes wood rot repair; replacement of deteriorated components, in kind; adjusting to operating condition; removal and installation of new glazing putty; glass replacement, in kind, where broken or missing; install weatherstripping at meeting rail and bottom rail; hardware restoration or replacement, in kind; priming and painting; and cleaning. Replacement trim shall match the existing historic trim in profile and dimension. Date stamp back of all new trim. Paint all windows and trim to match historic finishes report. Treat all replacement wood with a preservative. Prime and back-prime all components.
36) Install wood storm windows or operable pre-finished aluminum storm windows, to protect the restored historic wood windows.
37) Restore screened door and hardware. Re-screen, as required. Doors 1/100 and 1/200
38) Restore exterior door and hardware. Install new lockset. Weatherstrip. Doors 1/100 and 1/102 1/200, 1/100, 2/006, 3/006, 2/203
39) Restore front step walls. Replace broken and cracked treads with new stone treads to match.
40) Scrape, clean, prime, and paint all of the exterior of the house, per the historic finishes report.
41) Replace deteriorated porch boards on all porches. If entire porch floor is replaced, install proper edge flashing with drip edge to drain. Paint entire porch floor.
42) Replace all deteriorated exterior trim or siding to match the existing.
43) Install painted galvanized steel handrail.
44) Replace deteriorated porch railings to meet current building code height and loading.
45) Replace or re-set stones serving as top tread of areaway to plumb condition.
46) Reconstruct cast stone walls, as required to plumb condition. Replace damaged or deteriorated units, in kind. Coordinate with construction of new ramps, retaining walls, and steps.
47) Install new ramp, retaining walls, steps, and railings, per plans.
48) Re-grade at perimeter of house to create positive slope away from the foundation. Install slight swale along west elevation, if required.
49) Repair concrete steps. Clean and install sealer.
50) Clean and seal concrete deck.
51) Install drain in planter.
52) Consider installation of supplemental guard railing to meet current code requirements.

Architectural – Interior:

53) New ADA compliant entry into basement: Cut new door opening in stone wall. Install new steel lintel and new exterior wood paneled door to replicate the existing historic doors at the house. New door and hardware to comply with ADA. Install new ADA

compliant concrete ramp and new handrails. Install cast stone retaining walls, as required.

54) Install new concrete steps and handrail at two locations in the basement.
55) Repair existing Door 2/006. Install sign indicated the door is no longer usable. Restore hardware and weatherstrip.
56) Install new exterior wall mounted lights outside egress doors at basement level.
57) Basement Walls: Remove exposed lath and plaster, furr-out from stone foundation and install new blue board with two skim coats to emulate historic plaster (match historic plaster wall surface). Install furring channels over existing masonry and install new gypsum board and wood baseboard. Insulate wall. Retain historic trim.
58) Basement Ceilings under east porch: Install required furring down from metal pan ceiling to install new, level, insulated, gypsum board ceiling.
59) Basement Floor: Prepare existing concrete floor with sealer and install new porcelain floor tiles.
60) New demonstration kitchen to include: commercial grade gas stove and fire suppression hood (exhaust into chimney – install new fire-rated liner), island with under counter cabinets, 3-part commercial sink, dishwasher, commercial refrigerator and freezer, cabinets, counters, and backsplash. Install new task lighting at island.
61) Basement Brick Masonry Walls: Repoint and paint exposed masonry walls, as required.
62) Basement Fireplace: Replace deteriorated steel lintel at firebox. Replace fractured brick, in kind. Repoint fireplace, as required. Clean chimney. Install metal flue liner. Install gas fireplace insert. Paint and repair existing mantel.
63) Areaway: Replace areaway drain. Install new or repair threshold at Door 1/001.
64) Basement Stairs: Restore steps. Restore all millwork, two doors, and hardware. Install new light at stair. Install new railing at steps.
65) Basement Ceiling in Kitchen: Insulate ceiling joists. Install new gypsum board ceiling and paint.
66) Basement: Install (3) new floor drains.
67) Interior Plaster Walls (First through Third Floors): Remove flaking and damaged plaster at walls. Install new wood lath where missing and apply new plaster.
68) Interior Wood Floors (First through Third Floors): Lightly refinish historic wood flooring. Repair, as required, to match existing.
69) Basement Mechanical, Laundry and Pantry Rooms: Repoint interior face of exterior masonry walls, as required. Install new waterproofing coating on interior surface of masonry and paint. Monitor for moisture intrusion. Install conditioned air and ventilation.
70) Crawl Space: Install ventilation in crawlspace. Install vapor barrier throughout. (may require removal and reinstallation of wood flooring. Insulate floor joists.
71) Historic Doors: Restore historic door and hardware to working condition. Replace or supplement hardware and hinges, as required, in kind.
72) Trim: Install new wood door trim at cased opening. Replace missing or deteriorated trim, in kind.
73) Install new doors and hardware, where missing. Sort through historic doors stored in the basement and use prior to purchasing new doors.
74) Entire House: Paint all walls, ceilings, and trim, as required.

75) Repair walls and ceilings, as required. Prime and paint all surfaces.
76) Install new gas-fired water heater in water Closet 005C in the basement. Provide combustion flue. Coordinate with existing south chimney
77) Install new ADA-compliant restroom in the basement, including: tile floor, toilet, lavatory, grab bars, exhaust fan, and all required accessories. Construct new insulated walls, as required.
78) Install new two new hose bibbs on exterior.
79) Install new structural steel columns and footing, as required by structural. Box around columns for finished appearance. Basement Room 001.
80) Repair tread nosing at East Foyer steps.
81) Install a total of five new bathrooms on second and third floor levels, each to include: toilet, sink/vanity, tub and/or shower, exhaust fan, and all required accessories.
82) Parlor: Furr out existing wall to create new duct chase for hvac and plumbing. Insulate.
83) Second and Third Floor Stairs: Lightly refinish all stair and related components. Preserve patina. Repair and stabilize, as required.
84) Inspect ends of all third floor ceiling timber joists once ceiling is removed from second floor. Sister or replace, as required.
85) Dining Room 104 and Second Floor Hall 200: Infill missing wood paneling and chair rail with replica to match the existing.
86) Install batt insulation at attic rafters. Install baffles to allow for air ventilation.
87) Window 002 in basement and in Bedroom 302: Install tempered glass in existing windows or install interior tempered window, as required near tub or stairs.
88) Install fire extinguishers throughout the house, and within seventy-five feet of every exit.
89) Conservatory: install replica steps to match existing historic east stairs. Install guard railing and handrails at steps. Repair and refinish wood flooring. Install appropriate historic light fixture at original fixture location.
90) Room 302: Install new wood flooring.
91) Dining Room 104 and Hall 200: Refresh existing historic board walls and/or ceiling, including all exposed beams, trim, and accessories. Preserve historic patina.
92) All Bedrooms: Provide fire escape ladder at window.
93) Door 2/203: Provide wood storm/screened door.
94) Hall 200: Infill existing opening in log wall. Structurally infill wall, per engineer.
95) Door 1/202: Fix existing historic door in place. Door will not be operable.
96) Parlor 101: Refurbish existing fireplace surround and hearth.
97) Parlor 101 and Basement 001: Install gas fireplace insert.

Mechanical/Electrical/Plumbing/Fire Protection Recommendations

Installation of all MEP systems shall be in compliance with all requirements in the 2015 International Building Codes, including 2015 International Fire Code, 2015 International Plumbing Code, 2015 International Mechanical Code, 2015 International Fuel Gas Code, and the 2014 National Electrical Code (NEC).

Immediate Treatment Recommendations

Mechanical Systems

1) The existing furnace unit has exceeded its anticipated useful life and should be thoroughly inspected by a qualified service technician and repaired or replaced as required. All existing ductwork should be thoroughly inspected, cleaned, and repaired or replaced as needed.

Electrical Systems

2) The existing electrical system should be visually inspected for damaged devices and branch circuit conductors. The branch circuits and the service entrance conductors should be megger tested to measure the insulation resistance in the conductors. A report should be supplied documenting the results of the test. Repairs should be made where necessary. The existing grounding system should be thoroughly reviewed and modifications should be made as necessary to ensure the system complies with NEC Article 250 requirements.

3) The existing lightning protection system should be thoroughly inspected to ensure all connections, cables, and components are properly installed and secured and that the installation is in compliance with UL Master Label certification requirements.

Fire Protection Systems

4) The functionality of the existing fire alarm system should be verified.

Short Term Treatment Recommendations

Security

5) The functionality of the existing intrusion detection system should be verified.

Mechanical Systems

6) The existing thermostat containing mercury and should be removed and carefully disposed of in an approved manner.

Long-Term Treatment Recommendations

Mechanical Systems

7) A new central heating and cooling system shall be installed. When the existing HVAC system is to be replaced, heating and cooling load calculations should be performed per current ASHRAE standards and the new equipment should be sized accordingly. The following design criteria should be used:
8) Outdoor design temperature: The ASHRAE outside summer and winter design conditions for Chicago, IL should be used for design purposes.
   Summer Outdoor Design Temperature: 89.5°F db (1.0%) / 73.3°F wb (MCWB)
   Winter Outdoor Design Temperature: 0.2°F db (99.6%)
   Inside Temperatures: The following temperatures (Summer/Winter) should be used for Thermal Comfort Design.
   Summer: 75°F db / 50% RH max
   Winter: 70°F db
9) Upon establishing the heating and cooling demands, a new HVAC system should be selected and sized to handle such demands. Insulation of walls and ceilings will impact the overall demand on the heating and cooling systems.
10) A traditional split system consisting of an interior furnace and an exterior condensing unit is not ideal for this application due to very limited space available to route ductwork throughout the house. Two appropriate options to consider for providing heating and cooling are outlined below.
11) Option 1 – Variable Refrigerant Flow System (VRF):
    a. A variable refrigerant flow (VRF) system would consist of condensing units located outside, individual VRF fan coil units located in each cooling zone, refrigerant piping, and branch selector boxes. The locations of the condensing unit and fan coil units will need to be carefully coordinated with the Architect and the NPS. Programmable thermostat(s) should be installed for each VRF fan coil.
    b. Advantages of the VRF system are that it can be configured as a ducted system or a ductless system. Disadvantages of this system are that the fan coil units may need to be exposed in the rooms they serve and the condensing units will be exposed outside. Penetrations through the walls and floor will also be required for refrigerant piping and electrical conduit to the fan coils and condensing units.
12) Option 2 – Geothermal Heat Pump System:
    a. A geothermal heat pump system would consist of a water source heat pumps and an accompanying geothermal well field. The heat pumps would contain MERV 11 filters. A new ductwork system would need to be installed throughout the building. Programmable thermostat(s) should be installed for control of the respective systems.
    b. A geothermal heat exchanger could be installed at the north end of the site where there is currently an open green space. A sample bore and conductivity test is required to determine the ground conditions. The results of the test are required to design the depth and number of bores. A typical heat exchanger consists of a series of vertical pipe bores. Polyethylene piping is installed in the

bores and is routed to a header. The header would preferably be located in the basement but could be installed in a vault on site. Water or glycol would be pumped through the pipe to provide a seasonal heat source or sink for the heat pumps.

c. This geothermal system has several advantages over the VRF system. It is more efficient, and would result in lower operating costs over the life of the system. It would eliminate the need for exterior condensing units, which would improve the historic integrity of the site. The system will also be quieter than a high efficiency VRF and condensing unit.
d. One disadvantage of this system is that the site will be disturbed. The drilling and site work would need to be carefully coordinated with the NPS to reduce the impact and ensure no archaeological artifacts are destroyed. Another disadvantage is that this system will have a higher first cost than the VRF systems.

13) Vertical fan coil units or heat pumps could be located in the new basement mechanical room to condition the basement and first floor spaces. Supply and return air to and from the basement would be provided through grilles mounted in the sides of soffits and ductwork routed from the grilles to the units through these soffits. Supply and return air to the first floor spaces would be provided by decorative grilles in the floor that are ducted to the units in the basement. The locations and appearance of the grilles would be closely coordinated with the Architect and the NPS to minimize the impact to the historical appearance of the space. Wall mounted, low-profile, ductless fan coil units or heat pumps should be mounted in the second and third floor bedrooms for conditioning these spaces. The locations and finishes of the wall mounted units would be closely coordinated with the Architect and the NPS to minimize the impact to the historical appearance of the space. Condensing units (if needed) would be located on grade on the south and/or east side(s) of the main house.
14) Programmable thermostats should be installed throughout the main house to provide temperature control for each space.
15) Adding a dedicated outside air unit in the basement is recommended to provide code required ventilation air for the occupants. This unit would include an enthalpy heat recovery wheel, filters, heating, and cooling. The unit would include the same heating and cooling equipment that is selected for the main system. The unit would be used to supply ventilation air to all rooms in the building and would exhaust air from all restrooms. Energy recovered from the exhaust air stream would be used to pre-treat the fresh air. The design for the outside air intake and exhaust hood will require careful coordination with the Architect and the NPS to minimize the impact on the building's historic integrity.
16) The kitchen will have a type 1 grease exhaust hood with a built in ansul system. The hood will require grease exhaust duct routed to the exterior. Careful coordination with the Architect will be required to minimize chase requirements and impact to the building's historic integrity. If an electric range is utilized, a recirculation hood may be a viable option upon approval from the AHJ. This would eliminate the need for the grease exhaust duct.

17) Existing historic metal grates and vents should be salvaged and reused. Unique or diagnostic features removed and not 'reused' are to be considered for the museum collection.

Electrical Systems

18) A new electrical service should be provided to serve the main house. A new 200 amp, 120/240 volt, single phase service entrance rated load center with a NEMA 1 enclosure and a 200 amp main circuit breaker should be surface mounted in the basement in Mechanical 003. This load center will be fed from below grade from the service disconnect located on the south wall of the brick house. If the existing grounding system is not sufficient, it should be updated. If not possible, the existing system should be removed and a new grounding system should be installed for the building in compliance with NEC Article 250. The grounding system should be connected to the lightning protection system.
19) All existing electrical devices, boxes, and wiring that cannot be salvaged or is not code compliant should be removed and discarded. Existing historic features such as the surface mounted wooden raceway, brass lamp sockets, and porcelain sockets should be retained, but not necessarily reused. Existing wooden raceway shall be abandoned in place and will not be reused. Existing sockets shall be inspected for compliance with current codes and planned for potential reuse.
20) Power and lighting branch circuit wiring within the building will be fed from the new main load center by copper conductors routed in EMT conduit. MC cable may be utilized for branch circuit wiring as a cost saving alternative. Where branch circuit wiring can't be concealed in walls, surface mounted raceway shall be utilized. New duplex receptacles and light fixtures shall be provided throughout the main house. AFCI and GFCI protection shall be provided as required to comply with NEC Article 210 requirements. All receptacles in the brick house shall be tamper-resistant per NEC requirements. Wall mounted occupancy sensor switches or ceiling mounted occupancy sensors shall be utilized in each space for automatic shutoff of the lighting to comply with current energy code requirements.
21) Internally illuminated LED exit signs should be provided to direct occupants to the exits. The exit signs shall be equipped with self-diagnostics and integral batteries to provide a minimum of 90 minutes of continuous operation following a loss of power
22) Emergency lighting should be provided to properly light the path of egress during a loss of power. Emergency lighting units shall be equipped with self-diagnostics and integral batteries to provide a minimum of 90 minute of continuous operation following a loss of power.
23) A new network switch will be installed in the basement of the main house. This switch will feed wireless access points (WAPs) located throughout the house as well as in each of the other buildings on site via CAT6 cable. Cable to each building will be routed below grade in PVC conduit.

Plumbing Systems

24) All existing, unused plumbing fixtures and piping systems should be removed from the house in their entirety.
25) New plumbing fixtures in the main house are to be located in the basement, the second floor, and the third floor and consist of four showers, one bathtub, six lavatories, six water closets, a 3-compartment sink, and a dishwasher. Routing of all plumbing system piping (water, waste, vent, gas, etc.) will need to be closely coordinated with the Architect to avoid visibility as much as possible.
26) New domestic water service will be added to serve the plumbing fixtures in the main house. The water service will be fed from the booster pump located in the basement of the brick house. A new high efficiency gas-fired, tank type hot water heater should be added in Water Closet 005C, located in the basement, to provide hot water to the fixtures in the main house. If hands-free faucets are used, thermostatic mixing valves must be installed to temper hot water supply to 110 degrees F. A new combustion air intake and flue should be provided for the water heater. New intake and flue piping should be routed to the exterior of the building. It is recommended that a new hot water recirculation system be added to reduce delivery time of hot water to all plumbing fixtures. Solar water heating should be explored to reduce water heater requirements. Solar panels could be located in the open green space at the north end of the site.
27) New sanitary sewer service will be added to serve the plumbing fixtures in the main house. The 4” sanitary sewer line will route below grade and will connect to the main site sanitary distribution system. Grey water harvesting (reuse of water from sinks and showers to flush water closets) should be explored. A grease interceptor may be required to serve the waste from the kitchen. Coordination with the local municipality will be required to determine the grease interceptor requirements.
28) New natural gas service will be added to serve the new water heater and mechanical units that are being added as well as other gas appliances in the house, including a fireplace(s) and kitchen cooktop. The gas line will be fed from the below grade site distribution system and will be type SDR11 HDPE pipe. The size of the gas line will need to be determined after the design of the other systems has progressed and selection of the appliances is complete.

Fire Protection Systems

29) Using the Historic Property Assessment Matrix in Chapter 7, Appendix A of the National Park Service Reference Manual 58, Structural Fire Management, a fire alarm system is required, and a fire sprinkler system is recommended for the structure.
30) The existing fire alarm system should be replaced with a new fire alarm system to comply with NPS and code requirements. The new system should provide notification to occupants in the event of a fire emergency.
31) A connection to the fire alarm system shall be provided at the kitchen hood to monitor the ansul system.
32) A new automated fire sprinkler system should be installed in the main house to comply with NPS and code requirements. The fire sprinkler system should be a wet system designed per NFPA and shall be fed from the fire pump located in the basement of the

brick house. Piping shall be routed below grade from the basement of the brick house to the basement of the main house. The pipe should be schedule 40 steel with threaded or grooved fittings. Schedule 10 pipe should not be allowed because of the probability of leaks due to the thin walls.

33) Due to the sensitive nature of the historic structure, it will be important to ensure that the piping and sprinkler layout is carefully coordinated and reviewed with the historic architect and NPS, in order to minimize the impact to the historic features and finishes.
34) A fire protection engineer should be retained to provide a fire alarm system design as well as a full sprinkler system design, including pipe layout, sizing, and sprinkler layouts. A code study should be done to determine the exact requirements of the fire protection systems based on the building's intended use. This will ensure that the system design is fully prescribed to minimize the impact on the historic building.

Building Code and Life Safety

References:
International Existing Building Code (IEBC) 2012
International Building Code (IBC) 2012

The Main House HS-18 is currently unoccupied.

Former Use –R3 (Residence) or B (Museum) –
Proposed Use - 'R3' Occupancy (Floors 1-3). Basement is 'B' Occupancy
Type VB, Un-Sprinklered. The recommendations are to install a fire suppression system in the building.

Gross Square Footage

Basement	1,297 sf
First Floor	823 sf
Second Floor	798 sf
Third Floor	941 sf
Total	3,859 sf

Occupant load for the building, per IBC –

Basement Accessory Spaces	471 sf / 300 sf	= 1 persons
Basement Kitchen	276 sf / 200 sf	= 1 persons
Basement Dining	237 sf / 15 sf	= 15 persons*
First Floor	823 sf / 200 sf	= 4 persons
Second Floor	800 sf / 200 sf	= 4 persons
Third Floor	941 sf / 200 sf	= 4 persons

Means of Egress – Per IEBC Table 1012.4, the use group is equal or less hazard, therefore the means of egress can stay the same.

Single Exit Building – Section 1021.2, Exception 6, allowed for R3 occupancy.

Sprinkler Required, minimum NFPA 13D, No standpipe required. Per IBC 907.2.11.2 smoke detectors are required. Recommendations include providing a smoke/fire alarm throughout. Existing Vertical Stair Openings – Must gain a Code Modification Request to justify an exception, per 803.2.1 R3 similar to R1 for sleeping units. Ensure third floor hall has rated lath and plaster walls and solid wood doors at bedrooms.

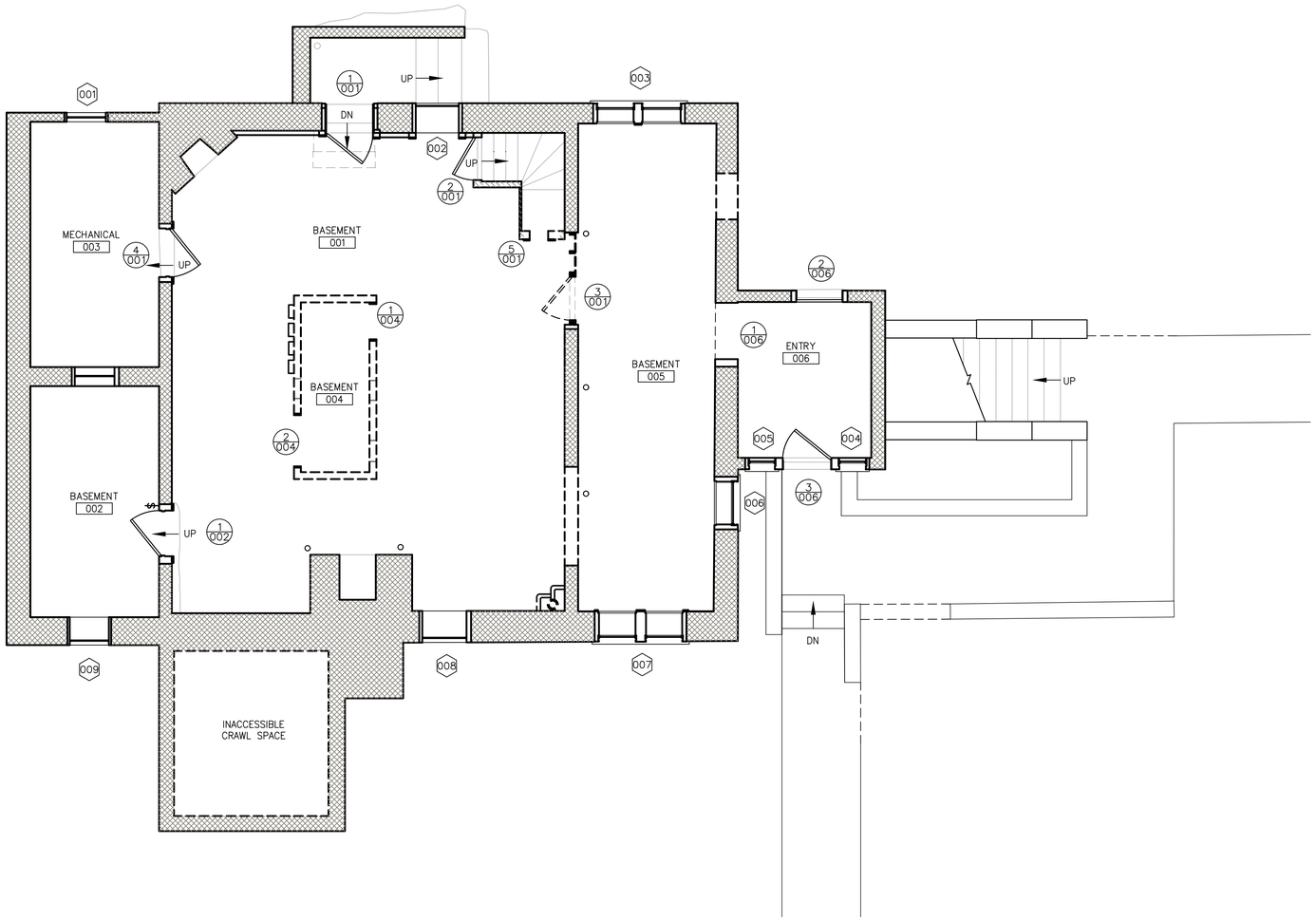
Single Public Restroom Provided in Basement – Per Section 1004.1.2, Exception, Actual # of occupancy shall be permitted to be used. *For the basement, the actual occupant load cannot exceed 15 persons and shall be posted as such.

Exit Signage not required for R3, but recommended based on the use of the house at each floor and egress door.
Provide fire extinguishers within seventy-five feet of all parts of the building. Provide a Type K in the Kitchen.

Wall/Floor Separation: Per Section 420.2 for R3, provide 30-minute separation between sleeping units (for sprinklered building). Wood lath and plaster provides 1 hour, per Section 1205.10. The Dining Room ceiling does not provide for separation from sleeping unit above. The installation of a fire suppression system, plus the thickness of the floor sheathing meets the intent of the code.

The building is not ADA accessible. Option 2 includes the modifications necessary to provide ADA accessibility and an ADA compliant restroom on the first floor of the building only. The second and third floors will not be ADA accessible.

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1 / A00 BASEMENT FLOOR DEMOLITION PLAN
1/4" = 1'-0"

PROJECT NORTH

DEMOLITION PLAN LEGEND
TO REMAIN
TO BE DEMOLISHED
DOOR TO REMAIN
DEMOLISH DOOR

KEY
DRAWING KEY NOTES
000 WINDOW NUMBER
000/0 DOOR NUMBER
000 ROOM NUMBER
BRICK/STONE WALL
LOG WALL
WOOD FRAME WALL

4 0 4 8
SCALE OF FEET

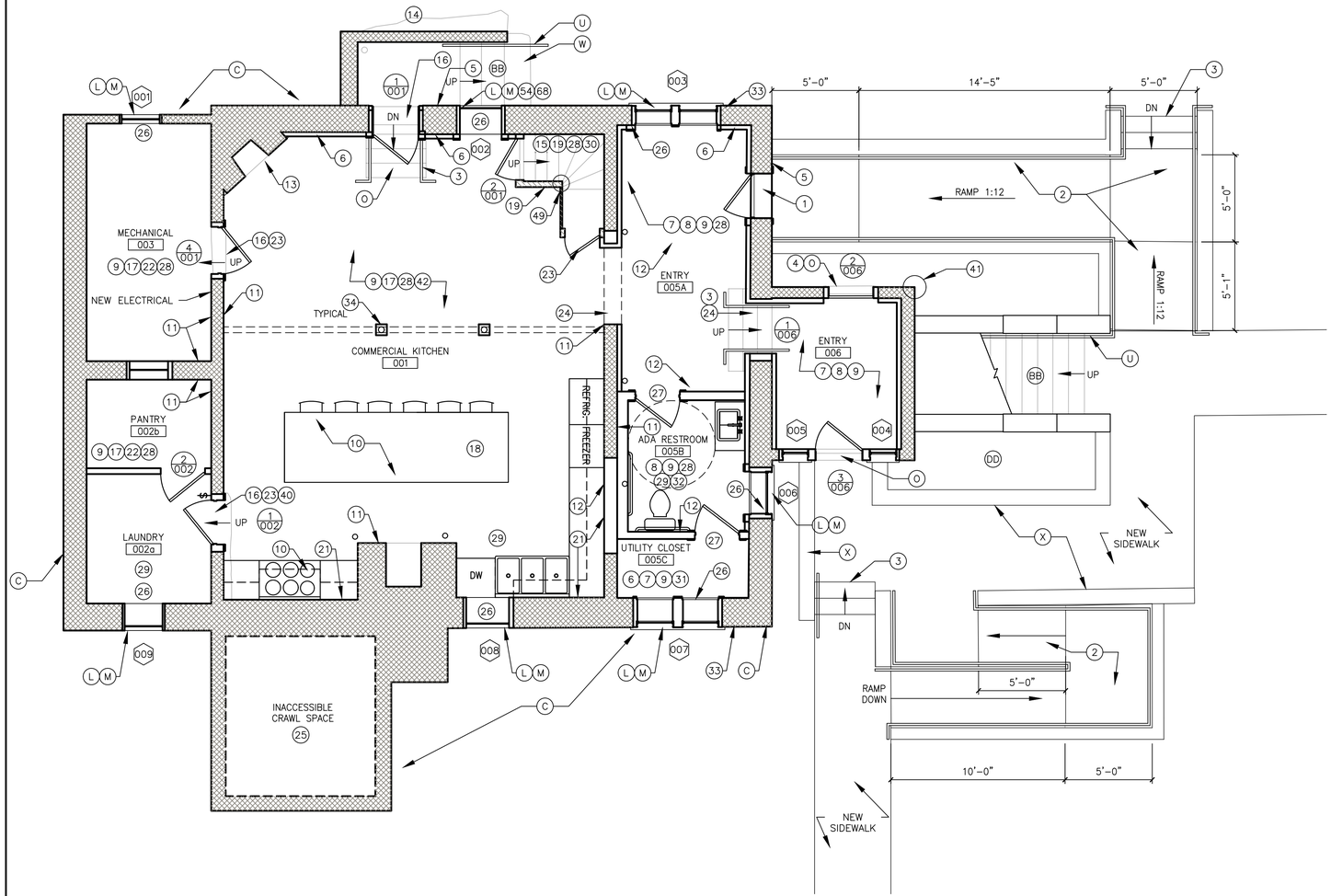
STRATA ARCHITECTURE + PRESERVATION
1701 Oak Street, Suite 100
Ph. 816-474-0900
www.strata-arch.com

DESIGNED: CA
CADD: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T A00

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 4 OF 48



1 / A01 BASEMENT FLOOR PLAN
1/4" = 1'-0"

PROJECT NORTH

4 0 4 8
SCALE OF FEET

KEY	
(#)	DRAWING KEY NOTES
000	WINDOW NUMBER
000 / 0	DOOR NUMBER
000	ROOM NUMBER
	BRICK/STONE WALL
	LOG WALL
	WOOD FRAME WALL

KEY NOTES INTERIOR

NOTE: ALPHABETICAL KEY NOTES CAN BE FOUND ON EXTERIOR ELEVATION SHEETS

1. CUT NEW DOOR OPENING IN STONE WALL. INSTALL NEW STEEL LINTEL AND NEW EXTERIOR WOOD PANELED DOOR TO REPLICATE THE EXISTING HISTORIC DOORS AT THE HOUSE. NEW DOOR AND HARDWARE TO COMPLY WITH ADA.
2. INSTALL NEW ADA COMPLIANT CONCRETE RAMP AND NEW HANDRAILS. INSTALL CAST STONE RETAINING WALLS, AS REQUIRED.
3. INSTALL NEW CONCRETE STEPS AND HANDRAIL.
4. REPAIR EXISTING DOOR. INSTALL SIGN INDICATING THE DOOR IS NO LONGER USABLE. RESTORE HARDWARE AND WEATHERSTRIP.
5. INSTALL NEW EXTERIOR WALL MOUNTED LIGHT.
6. REMOVE EXPOSED LATH AND PLASTER, FURR OUT FROM STONE FOUNDATION AND INSTALL NEW BLUE BOARD WITH TWO SKIM COATS TO EMULATE HISTORIC PLASTER (MATCH HISTORIC PLASTER WALL SURFACE).
7. INSTALL FURRING CHANNELS OVER EXISTING MASONRY AND INSTALL NEW GYPSUM BOARD AND WOOD BASEBOARD. INSULATE WALL. RETAIN HISTORIC TRIM.
8. INSTALL REQUIRED FURRING DOWN FROM METAL PAN CEILING TO INSTALL NEW, LEVEL, INSULATED, GYPSUM BOARD CEILING.
9. PREPARE EXISTING CONCRETE FLOOR WITH SEALER AND INSTALL NEW PORCELAIN FLOOR TILES.
10. NEW DEMONSTRATION KITCHEN TO INCLUDE: COMMERCIAL GRADE GAS STOVE AND FIRE SUPPRESSION HOOD (EXHAUST INTO CHIMNEY – INSTALL NEW FIRE-RATED LINER), ISLAND WITH UNDER COUNTER CABINETS, 3-PART COMMERCIAL SINK, DISHWASHER, COMMERCIAL REFRIGERATOR AND FREEZER, CABINETS, COUNTERS, AND BACKSPLASH.
11. REPOINT AND PAINT EXPOSED MASONRY WALLS, AS REQUIRED.
12. CONSTRUCT NEW GYPSUM/WOOD STUD WALL. INSULATE BATHROOM WALLS.
13. REPLACE DETERIORATED STEEL LINTEL AT FIREBOX. REPLACE FRACTURED BRICK, IN KIND. REPOINT FIREPLACE, AS REQUIRED. CLEAN CHIMNEY. INSTALL METAL FLUE LINER. INSTALL GAS FIREPLACE INSERT. PAINT AND REPAIR EXISTING MANTEL.
14. REPLACE AREAWAY DRAIN.
15. RESTORE STEPS. RESTORE ALL MILLWORK, TWO DOORS, AND HARDWARE. INSTALL NEW LIGHT AT STAIR.
16. INSTALL NEW OR REPAIR THRESHOLD.
17. INSULATE JOISTS. INSTALL NEW GYPSUM CEILING BOARD CEILING AND PAINT.
18. INSTALL NEW TASK LIGHTING AT ISLAND.
19. REMOVE FLAKING AND DAMAGED PLASTER AT WALLS. INSTALL NEW WOOD LATH WHERE MISSING AND APPLY NEW PLASTER.
20. LIGHTLY REFINISH HISTORIC WOOD FLOORING. REPAIR, AS REQUIRED, TO MATCH EXISTING.
21. INSTALL BACKSPLASH.
22. REPOINT INTERIOR FACE OF EXTERIOR MASONRY WALLS, AS REQUIRED. INSTALL NEW WATERPROOFING COATING ON INTERIOR SURFACE OF MASONRY AND PAINT. MONITOR FOR MOISTURE INTRUSION. INSTALL CONDITIONED AIR AND VENTILATION.
23. RESTORE HISTORIC DOOR AND HARDWARE TO WORKING CONDITION. REPLACE OR SUPPLEMENT HARDWARE AND HINGES, AS REQUIRED, IN KIND.
24. INSTALL NEW WOOD DOOR TRIM AT CASED OPENING.
25. INSTALL VENTILATION IN CRAWLSPACE. INSTALL VAPOR BARRIER THROUGHOUT. (MAY REQUIRE REMOVAL AND REINSTALLATION OF WOOD FLOORING. INSULATE FLOOR JOISTS.
26. REPLACE MISSING OR DETERIORATED TRIM, IN KIND.
27. INSTALL NEW DOOR AND HARDWARE.
28. PAINT ALL WALLS, CEILINGS, AND TRIM, AS REQUIRED.
29. INSTALL NEW FLOOR DRAIN.
30. REPAIR WALLS AND CEILINGS, AS REQUIRED. PRIME AND PAINT ALL SURFACES.
31. INSTALL NEW GAS-FIRED WATER HEATER IN WATER CLOSET 005C IN THE BASEMENT. PROVIDE COMBUSTION FLUE. COORDINATE WITH EXISTING SOUTH CHIMNEY
32. INSTALL NEW ADA-COMPLIANT RESTROOM IN THE BASEMENT, INCLUDING: TILE FLOOR, TOILET, LAVATORY, GRAB BARS, EXHAUST FAN, AND ALL REQUIRED ACCESSORIES.
33. INSTALL NEW HOSE BIBB.
34. INSTALL NEW STRUCTURAL STEEL COLUMNS AND FOOTING, AS REQUIRED BY STRUCTURAL. BOX AROUND COLUMNS FOR FINISHED APPEARANCE.
35. REPAIR TREAD NOSING.
36. INSTALL A TOTAL OF FIVE NEW BATHROOMS ON SECOND AND THIRD FLOOR LEVELS, EACH TO INCLUDE: TOILET, SINK/VANITY, TUB AND/OR SHOWER, EXHAUST FAN, AND ALL REQUIRED ACCESSORIES.
37. FURR OUT EXISTING WALL TO CREATE NEW DUCT CHASE FOR HVAC AND PLUMBING. INSULATE.
38. LIGHTLY REFINISH ALL STAIR AND RELATED COMPONENTS. PRESERVE PATINA.
39. INSTALL NEW RAILING AT STEPS.
40. INSTALL LINTEL AT ROOM 002 DOOR 1/002.
41. ROOM 006 UNDER EAST STEPS – UNDERPIN OR MUD JACK WALL AND REPOINT OPEN MORTAR JOINTS.
42. FIRST FLOOR FRAMING: UPON REMOVAL OF BASEMENT CEILING IN ITS ENTIRETY, INSPECT EACH FLOOR JOIST AND REPLACE, AS REQUIRED. RE-EVALUATE REMOVAL OF STEEL BEAMS AT THIS TIME. PLAN IS TO REMOVE THE SOUTH TWO BEAMS AND RELATED POSTS. PATCH FLOOR/WALLS, AS REQUIRED, IN KIND. NORTHERNMOST BEAM TO REMAIN.
43. SECOND FLOOR FRAMING: INSTALL SUPPLEMENTAL FRAMING TO REDUCE SPANS OF E/W SECOND FLOOR FRAMING,
    a. ROOM 101: REMOVE EXISTING SUPPLEMENTAL BEAMS INSTALLED IN THE 1960S AND ALL RELATED ACCESSORIES FROM THIS SPACE. REMOVE EXISTING CEILING IN ITS ENTIRETY (COORDINATE WITH ASBESTOS ABATEMENT). PROVIDE SHORING DURING CONSTRUCTION, AS REQUIRED. INSPECT ALL EXPOSED SECOND FLOOR FRAMING, REPAIR/REPLACE, AS REQUIRED. CUT EXISTING BEAMS IN ORDER TO INSTALL TWO W8X21 A992 STEEL MEMBERS (NORTH/SOUTH), ONE ON EITHER SIDE OF FIREPLACE. INSTALL TOTAL (3) THREE STEEL POSTS INSIDE CENTER WALL, TO BEAR ON EXISTING STEEL BEAM BELOW. INSTALL STIFFENER PLATES AT EXISTING BEAM WHERE POSTS WILL BE LOCATED. NEW N/S BEAMS SHALL TIE INTO CENTER POST LOCATIONS. REFER TO STRUCTURAL REPAIR PLANS AND DETAILS. INSTALL BEARING PLATES IN NOTCHED LOG WALLS TO SUPPORT NEW BEAMS. COORDINATE DETAIL, DEPENDENT UPON LOCATION AND FIELD CONDITIONS. INCORPORATE NEW POSTS AND STEEL MEMBERS WITHIN CENTER WALL, IF POSSIBLE.
    b. ROOM 104: INSTALL NEW SUPPLEMENTAL W8X21 A992 STEEL MEMBERS (NORTH/SOUTH), PER STRUCTURAL REPAIR PLANS AND DETAILS. CLAD NEW N/S MEMBERS WITH WOOD TRIM TO EMULATE BEAM.
44. THIRD FLOOR FRAMING: UTILIZE STEEL BEAMS TO REDUCE SPANS, PER STRUCTURAL PLANS AND DETAILS. INSTALL CENTRAL BEAM AND POSTS ABOVE SECOND FLOOR FRAMING TO CREATE A DIRECT LOAD PATH TO THE FOUNDATION.
45. ROOM 200: INSTALL NEW JOISTS ON EITHER SIDE OF ROTTED E/W CEILING TIMBER.
46. INSPECT ENDS OF ALL THIRD FLOOR CEILING TIMBER JOISTS ONCE CEILING IS REMOVED FROM SECOND FLOOR. SISTER OR REPLACE, AS REQUIRED.
47. ROOM 201: RETAIN EXISTING EXPOSED CEILING TIMBERS. REPLACE ROTTED BEAM WHERE DETERIORATED AT EAST WALL. INSTALL SUPPLEMENTAL FLOOR FRAMING. DIFFERENTIATE FROM HISTORIC CEILING TIMBERS.
48. ROOF FRAMING: EXISTING ROOF FRAMING IS BURNED AND DETERIORATED AND IS COMPOSED OF AT LEAST TWO DIFFERENT ROOF FRAMING SYSTEMS. RECOMMENDED TREATMENT IS TO RE-FRAME ENTIRE ROOF STRUCTURE. WORK TO BE PERFORMED BY A DESIGN/BUILD ROOFING CONTRACTOR AND OVERSEEN BY A STRUCTURAL ENGINEER. HISTORIC LOG RAFTERS MAY BE ABLE TO BE PRESERVED AS PART OF THE RE-ROOFING EFFORTS, BUT NOT UTILIZED IN A STRUCTURAL CAPACITY. COORDINATE WITH ABATEMENT OF ASBESTOS ROOFING UNDERLAYMENT.
49. INTERIOR STAIRS:
    a. STAIRS FROM BASEMENT TO FIRST FLOOR: REPLACE 4-INCH SQUARE WOOD POST WITH STEEL POST AND NEW CONCRETE ROOFING.
    b. CUT BASE OF WOOD POST AT FIRST FLOOR TO ALLOW FOR INSERTION OF STEEL BEAM TO SPAN FROM EXTERIOR WALL TO TOP OF NEW STEEL POST. UP-SET STEEL BEAM FROM FIRST FINISH FLOOR, TO ALLOW HEAD ROOM TO PASS AT THE STAIRS. THIS WILL REQUIRE MODIFICATION OF BALUSTERS AND DOOR TO CLOSET UNDER STAIRS. CLAD STEEL IN WOOD CASEWORK.
    c. REPAIR STAIR TREADS FROM BASEMENT TO FIRST FLOOR.
    d. STAIR FROM SECOND FLOOR TO THIRD FLOOR: CAREFULLY REMOVE EXISTING MILLWORK ON UNDERSIDE OF STAIR. INSTALL ADDITIONAL INTERIOR STRINGERS OR REINFORCE UNDERSIDE WITH STEEL ANGLE. REINSTALL MILLWORK IN ORIGINAL LOCATIONS AFTER PERFORMING WORK.
50. REPLACE TOP LOGS AT WEST SIDE OF HOUSE.
51. INFILL MISSING WOOD PANELING AND CHAIR RAIL WITH REPLICA TO MATCH THE EXISTING.
52. INSTALL SOUND ATTENUATION BATT INSULATION IN ALL WALLS SURROUNDING BATHROOMS. INSTALL SOUND ATTENUATION BATT INSULATION AT ALL FLOOR FRAMING SYSTEMS, AS ALLOWABLE.
53. INSTALL BATT INSULATION AT ATTIC RAFTERS. INSTALL BAFFLES TO ALLOW FOR AIR VENTILATION.
54. INSTALL TEMPERED GLASS, AS REQUIRED NEAR TUB OR STAIRS.
55. INSTALL FIRE EXTINGUISHER.
56. CONSERVATORY: INSTALL REPLICA STEPS TO MATCH EXISTING HISTORIC EAST STAIRS. INSTALL GUARD RAILING AND HANDRAILS AT STEPS. REPAIR AND REFINISH WOOD FLOORING.
57. INSTALL APPROPRIATE HISTORIC LIGHT FIXTURE AT ORIGINAL FIXTURE LOCATION.
58. DEMOLISH EXISTING PLUMBING. PATCH AND REPAIR AFFECTED AREAS TO MATCH HISTORIC MATERIALS.
59. INSTALL NEW WOOD FLOORING.
60. REFRESH EXISTING HISTORIC BOARD WALLS AND/OR CEILING, INCLUDING ALL EXPOSED BEAMS, TRIM, AND ACCESSORIES. PRESERVE HISTORIC PATINA.
61. PROVIDE FIRE ESCAPE LADDER AT WINDOW.
62. PROVIDE WOOD STORM/SCREENED DOOR.
63. INFILL EXISTING OPENING IN LOG WALL. STRUCTURALLY INFILL WALL, PER ENGINEER.
64. UTILIZE ALL DUCT CHASES FOR NEW PIPING AND ELECTRICAL CONDUIT.
65. INSTALL REPLICA DOOR TO MATCH HISTORIC DOORS.
66. FIX EXISTING HISTORIC DOOR IN PLACE. DOOR WILL NOT BE OPERABLE.
67. INSTALL INSULATED GYPSUM BOARD ON WALLS AND CEILINGS THROUGHOUT.
68. INSTALL SEALANT AT JOINT BETWEEN WALL AND STEPS.
69. REFURBISH EXISTING FIREPLACE SURROUND AND HEARTH.
70. INSTALL GAS FIREPLACE INSERT.
71. INSTALL NEW TRIM TO REPLICATE HISTORIC TRIM. REFINISH TO MATCH EXISTING HISTORIC TRIM.
72. REPAIR EXISTING TRIM OR REPLACE IN KIND. REFINISH TO MATCH EXISTING HISTORIC TRIM.
73. REUSE EXISTING HISTORIC CLAW FOOT TUB. REFINISH AND RESTORE.
74. CAREFULLY REMOVE HISTORIC PANELING TO INSTALL STRUCTURAL COLUMNS. REINSTALL PANELING IN ORIGINAL LOCATION.
75. STRUCTURAL BEAM ABOVE, REFERENCE STRUCTURAL

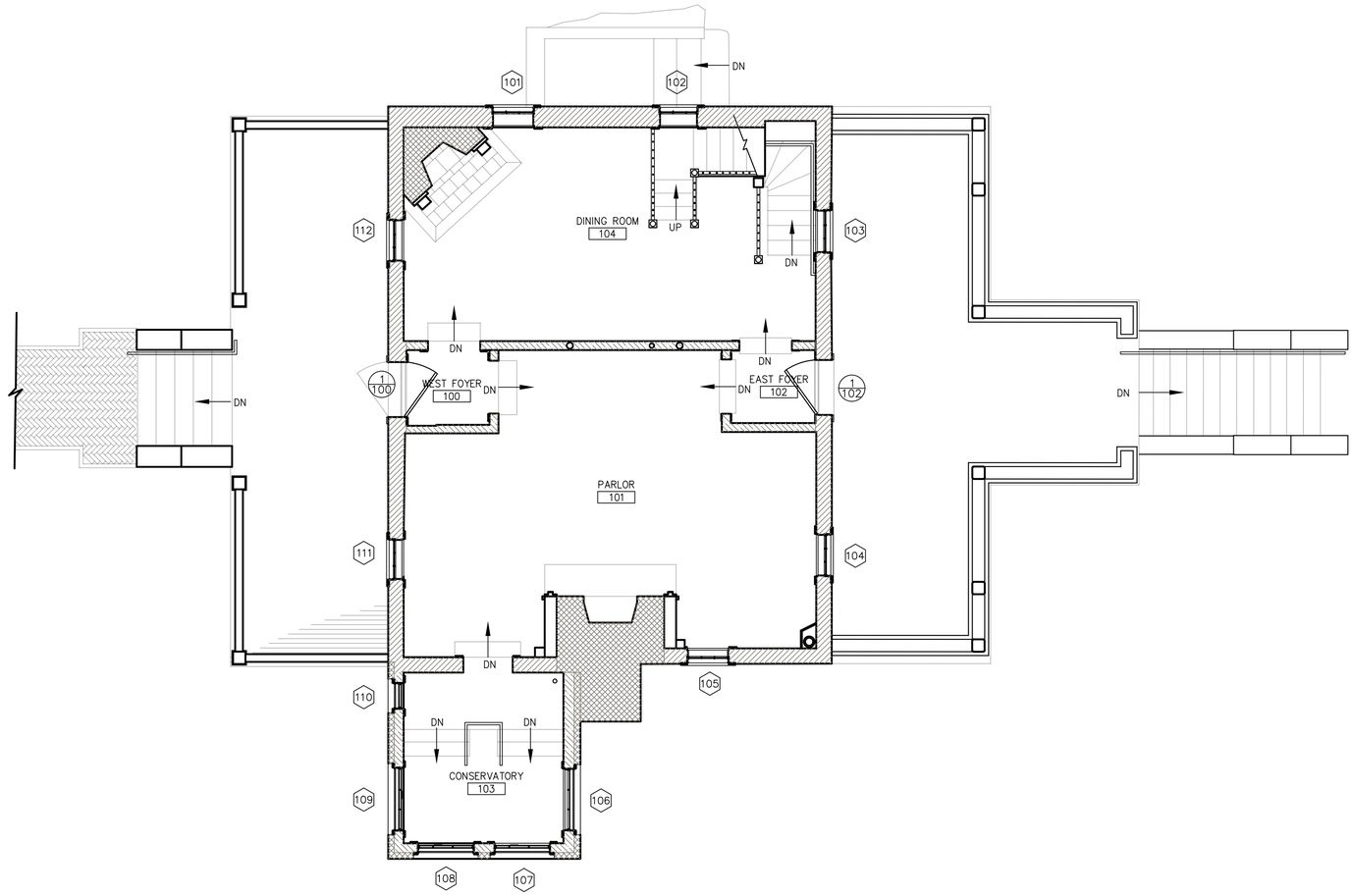
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DATE: 05/07/18

SUB SHEET NO. T A01

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 5 OF 48



1 / A02 FIRST FLOOR DEMOLITION PLAN
1/4" = 1'-0"

PROJECT NORTH

DEMOLITION PLAN LEGEND

- TO REMAIN
- TO BE DEMOLISHED
- DOOR TO REMAIN
- DEMOLISH DOOR

KEY

- (#) DRAWING KEY NOTES
- (000) WINDOW NUMBER
- (000/0) DOOR NUMBER
- [000] ROOM NUMBER
- BRICK/STONE WALL
- LOG WALL
- WOOD FRAME WALL

4 0 4 8
SCALE OF FEET

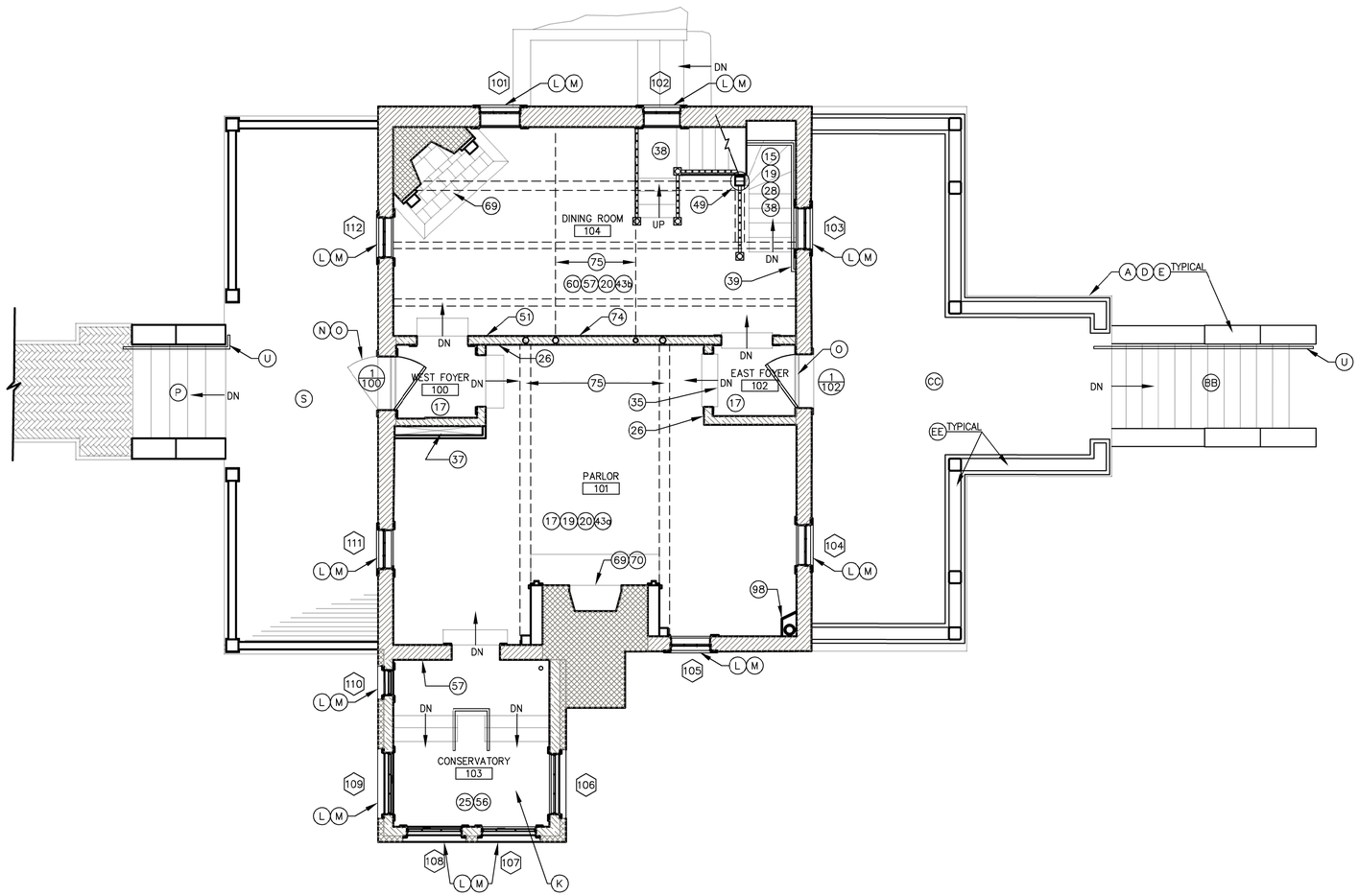
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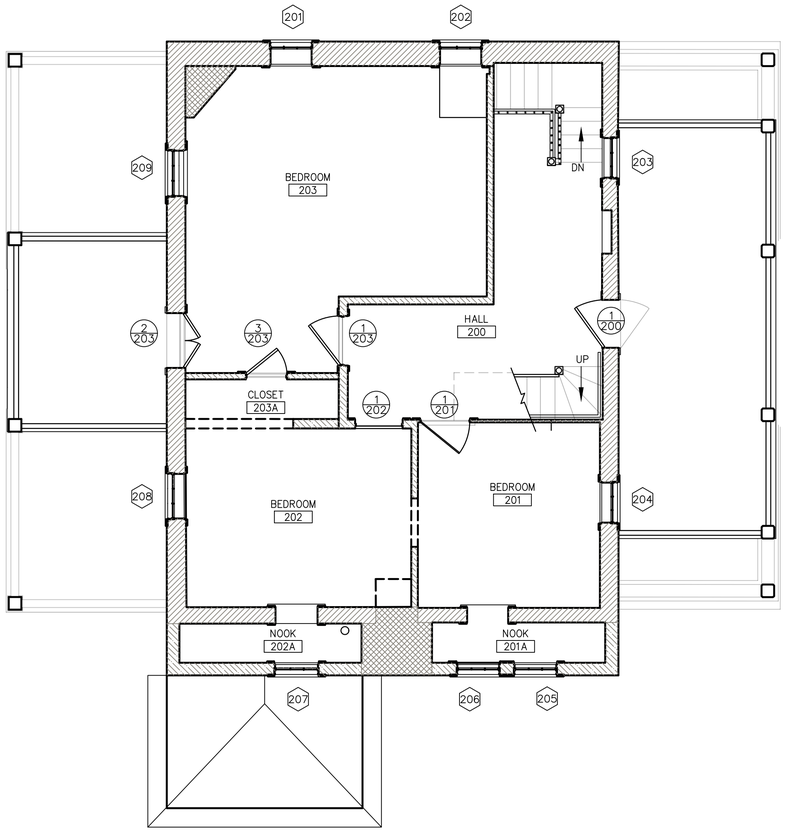
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DATE: 05/07/18

SUB SHEET NO. T A02

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 6 OF 48


DINING ROOM
104
UP
DN
WEST FOYER
100
EAST FOYER
102
PARLOR
101
CONSERVATORY
103
TYPICAL
TYPICAL
101
102
103
104
105
106
107
108
109
110
111
112
DN
DN
DN



1 / A04 SECOND FLOOR DEMOLITION PLAN
1/4" = 1'-0"

PROJECT NORTH

DEMOLITION PLAN LEGEND

- TO REMAIN
- TO BE DEMOLISHED
- DOOR TO REMAIN
- DEMOLISH DOOR

KEY

- (#) DRAWING KEY NOTES
- 000 WINDOW NUMBER
- 000/0 DOOR NUMBER
- 000 ROOM NUMBER
- BRICK/STONE WALL
- LOG WALL
- WOOD FRAME WALL

4 0 4 8
SCALE OF FEET

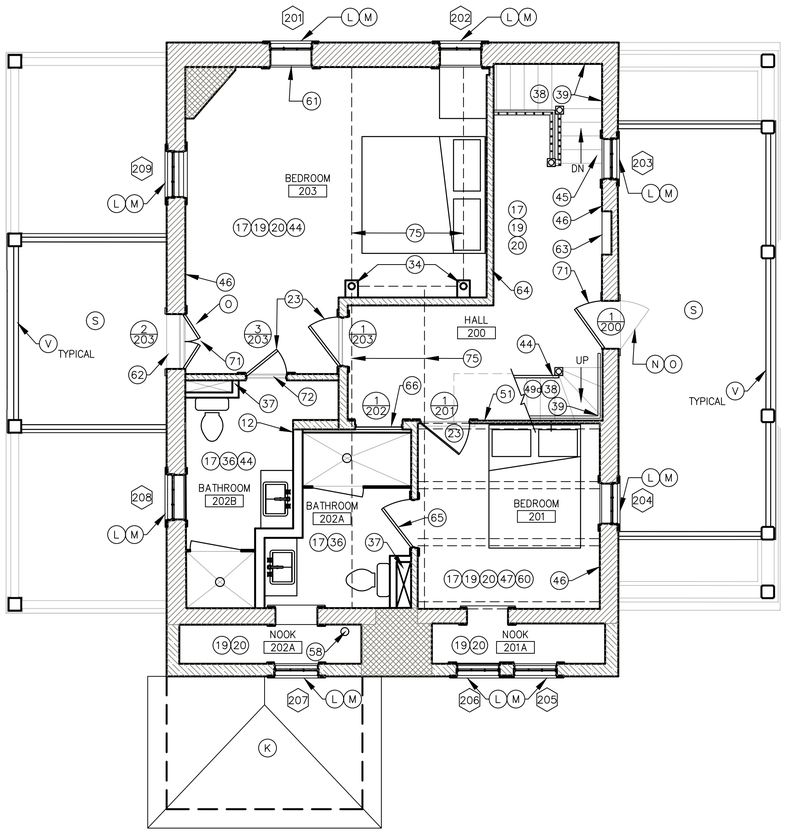
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SUB SHEET NO. T A04

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 8 OF 48



1 A05 SECOND FLOOR PLAN
1/4" = 1'-0"

PROJECT NORTH

4 0 4 8
SCALE OF FEET

KEY

#	DRAWING KEY NOTES
000	WINDOW NUMBER
000 0	DOOR NUMBER
000	ROOM NUMBER
	BRICK/STONE WALL
	LOG WALL
	WOOD FRAME WALL

KEY NOTES INTERIOR

NOTE: ALPHABETICAL KEY NOTES CAN BE FOUND ON EXTERIOR ELEVATION SHEETS

1. CUT NEW DOOR OPENING IN STONE WALL. INSTALL NEW STEEL LINTEL AND NEW EXTERIOR WOOD PANELED DOOR TO REPLICATE THE EXISTING HISTORIC DOORS AT THE HOUSE. NEW DOOR AND HARDWARE TO COMPLY WITH ADA.
2. INSTALL NEW ADA COMPLIANT CONCRETE RAMP AND NEW HANDRAILS. INSTALL CAST STONE RETAINING WALLS, AS REQUIRED.
3. INSTALL NEW CONCRETE STEPS AND HANDRAIL.
4. REPAIR EXISTING DOOR. INSTALL SIGN INDICATING THE DOOR IS NO LONGER USABLE. RESTORE HARDWARE AND WEATHERSTRIP.
5. INSTALL NEW EXTERIOR WALL MOUNTED LIGHT.
6. REMOVE EXPOSED LATH AND PLASTER, FURR OUT FROM STONE FOUNDATION AND INSTALL NEW BLUE BOARD WITH TWO SKIM COATS TO EMULATE HISTORIC PLASTER (MATCH HISTORIC PLASTER WALL SURFACE).
7. INSTALL FURRING CHANNELS OVER EXISTING MASONRY AND INSTALL NEW GYPSUM BOARD AND WOOD BASEBOARD. INSULATE WALL. RETAIN HISTORIC TRIM.
8. INSTALL REQUIRED FURRING DOWN FROM METAL PAN CEILING TO INSTALL NEW, LEVEL, INSULATED, GYPSUM BOARD CEILING.
9. PREPARE EXISTING CONCRETE FLOOR WITH SEALER AND INSTALL NEW PORCELAIN FLOOR TILES.
10. NEW DEMONSTRATION KITCHEN TO INCLUDE: COMMERCIAL GRADE GAS STOVE AND FIRE SUPPRESSION HOOD (EXHAUST INTO CHIMNEY – INSTALL NEW FIRE-RATED LINER), ISLAND WITH UNDER COUNTER CABINETS, 3-PART COMMERCIAL SINK, DISHWASHER, COMMERCIAL REFRIGERATOR AND FREEZER, CABINETS, COUNTERS, AND BACKSPLASH.
11. REPOINT AND PAINT EXPOSED MASONRY WALLS, AS REQUIRED.
12. CONSTRUCT NEW GYPSUM/WOOD STUD WALL. INSULATE BATHROOM WALLS.
13. REPLACE DETERIORATED STEEL LINTEL AT FIREBOX. REPLACE FRACTURED BRICK, IN KIND. REPOINT FIREPLACE, AS REQUIRED. CLEAN CHIMNEY. INSTALL METAL FLUE LINER. INSTALL GAS FIREPLACE INSERT. PAINT AND REPAIR EXISTING MANTEL.
14. REPLACE AREAWAY DRAIN.
15. RESTORE STEPS. RESTORE ALL MILLWORK, TWO DOORS, AND HARDWARE. INSTALL NEW LIGHT AT STAIR.
16. INSTALL NEW OR REPAIR THRESHOLD.
17. INSULATE JOISTS. INSTALL NEW GYPSUM CEILING BOARD CEILING AND PAINT.
18. INSTALL NEW TASK LIGHTING AT ISLAND.
19. REMOVE FLAKING AND DAMAGED PLASTER AT WALLS. INSTALL NEW WOOD LATH WHERE MISSING AND APPLY NEW PLASTER.
20. LIGHTLY REFINISH HISTORIC WOOD FLOORING. REPAIR, AS REQUIRED, TO MATCH EXISTING.
21. INSTALL BACKSPLASH.
22. REPOINT INTERIOR FACE OF EXTERIOR MASONRY WALLS, AS REQUIRED. INSTALL NEW WATERPROOFING COATING ON INTERIOR SURFACE OF MASONRY AND PAINT. MONITOR FOR MOISTURE INTRUSION. INSTALL CONDITIONED AIR AND VENTILATION.
23. RESTORE HISTORIC DOOR AND HARDWARE TO WORKING CONDITION. REPLACE OR SUPPLEMENT HARDWARE AND HINGES, AS REQUIRED, IN KIND.
24. INSTALL NEW WOOD DOOR TRIM AT CASED OPENING.
25. INSTALL VENTILATION IN CRAWLSPACE. INSTALL VAPOR BARRIER THROUGHOUT. (MAY REQUIRE REMOVAL AND REINSTALLATION OF WOOD FLOORING. INSULATE FLOOR JOISTS.
26. REPLACE MISSING OR DETERIORATED TRIM, IN KIND.
27. INSTALL NEW DOOR AND HARDWARE.
28. PAINT ALL WALLS, CEILINGS, AND TRIM, AS REQUIRED.
29. INSTALL NEW FLOOR DRAIN.
30. REPAIR WALLS AND CEILINGS, AS REQUIRED. PRIME AND PAINT ALL SURFACES.
31. INSTALL NEW GAS-FIRED WATER HEATER IN WATER CLOSET 005C IN THE BASEMENT. PROVIDE COMBUSTION FLUE. COORDINATE WITH EXISTING SOUTH CHIMNEY
32. INSTALL NEW ADA-COMPLIANT RESTROOM IN THE BASEMENT, INCLUDING: TILE FLOOR, TOILET, LAVATORY, GRAB BARS, EXHAUST FAN, AND ALL REQUIRED ACCESSORIES.
33. INSTALL NEW HOSE BIBB.
34. INSTALL NEW STRUCTURAL STEEL COLUMNS AND FOOTING, AS REQUIRED BY STRUCTURAL. BOX AROUND COLUMNS FOR FINISHED APPEARANCE.
35. REPAIR TREAD NOSING.
36. INSTALL A TOTAL OF FIVE NEW BATHROOMS ON SECOND AND THIRD FLOOR LEVELS, EACH TO INCLUDE: TOILET, SINK/VANITY, TUB AND/OR SHOWER, EXHAUST FAN, AND ALL REQUIRED ACCESSORIES.
37. FURR OUT EXISTING WALL TO CREATE NEW DUCT CHASE FOR HVAC AND PLUMBING. INSULATE.
38. LIGHTLY REFINISH ALL STAIR AND RELATED COMPONENTS. PRESERVE PATINA.
39. INSTALL NEW RAILING AT STEPS.
40. INSTALL LINTEL AT ROOM 002 DOOR 1/002.
41. ROOM 006 UNDER EAST STEPS – UNDERPIN OR MUD JACK WALL AND REPOINT OPEN MORTAR JOINTS.
42. FIRST FLOOR FRAMING: UPON REMOVAL OF BASEMENT CEILING IN ITS ENTIRETY, INSPECT EACH FLOOR JOIST AND REPLACE, AS REQUIRED. RE-EVALUATE REMOVAL OF STEEL BEAMS AT THIS TIME. PLAN IS TO REMOVE THE SOUTH TWO BEAMS AND RELATED POSTS. PATCH FLOOR/WALLS, AS REQUIRED, IN KIND. NORTHERNMOST BEAM TO REMAIN.
43. SECOND FLOOR FRAMING: INSTALL SUPPLEMENTAL FRAMING TO REDUCE SPANS OF E/W SECOND FLOOR FRAMING,
    a. ROOM 101: REMOVE EXISTING SUPPLEMENTAL BEAMS INSTALLED IN THE 1960S AND ALL RELATED ACCESSORIES FROM THIS SPACE. REMOVE EXISTING CEILING IN ITS ENTIRETY (COORDINATE WITH ASBESTOS ABATEMENT). PROVIDE SHORING DURING CONSTRUCTION, AS REQUIRED. INSPECT ALL EXPOSED SECOND FLOOR FRAMING, REPAIR/REPLACE, AS REQUIRED. CUT EXISTING BEAMS IN ORDER TO INSTALL TWO W8X21 A992 STEEL MEMBERS (NORTH/SOUTH), ONE ON EITHER SIDE OF FIREPLACE. INSTALL TOTAL (3) THREE STEEL POSTS INSIDE CENTER WALL, TO BEAR ON EXISTING STEEL BEAM BELOW. INSTALL STIFFENER PLATES AT EXISTING BEAM WHERE POSTS WILL BE LOCATED. NEW N/S BEAMS SHALL TIE INTO CENTER POST LOCATIONS. REFER TO STRUCTURAL REPAIR PLANS AND DETAILS. INSTALL BEARING PLATES IN NOTCHED LOG WALLS TO SUPPORT NEW BEAMS. COORDINATE DETAIL, DEPENDENT UPON LOCATION AND FIELD CONDITIONS. INCORPORATE NEW POSTS AND STEEL MEMBERS WITHIN CENTER WALL, IF POSSIBLE.
    b. ROOM 104: INSTALL NEW SUPPLEMENTAL W8X21 A992 STEEL MEMBERS (NORTH/SOUTH), PER STRUCTURAL REPAIR PLANS AND DETAILS. CLAD NEW N/S MEMBERS WITH WOOD TRIM TO EMULATE BEAM.
44. THIRD FLOOR FRAMING: UTILIZE STEEL BEAMS TO REDUCE SPANS, PER STRUCTURAL PLANS AND DETAILS. INSTALL CENTRAL BEAM AND POSTS ABOVE SECOND FLOOR FRAMING TO CREATE A DIRECT LOAD PATH TO THE FOUNDATION.
45. ROOM 200: INSTALL NEW JOISTS ON EITHER SIDE OF ROTTED E/W CEILING TIMBER.
46. INSPECT ENDS OF ALL THIRD FLOOR CEILING TIMBER JOISTS ONCE CEILING IS REMOVED FROM SECOND FLOOR. SISTER OR REPLACE, AS REQUIRED.
47. ROOM 201: RETAIN EXISTING EXPOSED CEILING TIMBERS. REPLACE ROTTED BEAM WHERE DETERIORATED AT EAST WALL. INSTALL SUPPLEMENTAL FLOOR FRAMING. DIFFERENTIATE FROM HISTORIC CEILING TIMBERS.
48. ROOF FRAMING: EXISTING ROOF FRAMING IS BURNED AND DETERIORATED AND IS COMPOSED OF AT LEAST TWO DIFFERENT ROOF FRAMING SYSTEMS. RECOMMENDED TREATMENT IS TO RE-FRAME ENTIRE ROOF STRUCTURE. WORK TO BE PERFORMED BY A DESIGN/BUILD ROOFING CONTRACTOR AND OVERSEEN BY A STRUCTURAL ENGINEER. HISTORIC LOG RAFTERS MAY BE ABLE TO BE PRESERVED AS PART OF THE RE-ROOFING EFFORTS, BUT NOT UTILIZED IN A STRUCTURAL CAPACITY. COORDINATE WITH ABATEMENT OF ASBESTOS ROOFING UNDERLAYMENT.
49. INTERIOR STAIRS:
    a. STAIRS FROM BASEMENT TO FIRST FLOOR: REPLACE 4-INCH SQUARE WOOD POST WITH STEEL POST AND NEW CONCRETE ROOFING.
    b. CUT BASE OF WOOD POST AT FIRST FLOOR TO ALLOW FOR INSERTION OF STEEL BEAM TO SPAN FROM EXTERIOR WALL TO TOP OF NEW STEEL POST. UP-SET STEEL BEAM FROM FIRST FINISH FLOOR, TO ALLOW HEAD ROOM TO PASS AT THE STAIRS. THIS WILL REQUIRE MODIFICATION OF BALUSTERS AND DOOR TO CLOSET UNDER STAIRS. CLAD STEEL IN WOOD CASEWORK.
    c. REPAIR STAIR TREADS FROM BASEMENT TO FIRST FLOOR.
    d. STAIR FROM SECOND FLOOR TO THIRD FLOOR: CAREFULLY REMOVE EXISTING MILLWORK ON UNDERSIDE OF STAIR. INSTALL ADDITIONAL INTERIOR STRINGERS OR REINFORCE UNDERSIDE WITH STEEL ANGLE. REINSTALL MILLWORK IN ORIGINAL LOCATIONS AFTER PERFORMING WORK.
50. REPLACE TOP LOGS AT WEST SIDE OF HOUSE.
51. INFILL MISSING WOOD PANELING AND CHAIR RAIL WITH REPLICA TO MATCH THE EXISTING.
52. INSTALL SOUND ATTENUATION BATT INSULATION IN ALL WALLS SURROUNDING BATHROOMS. INSTALL SOUND ATTENUATION BATT INSULATION AT ALL FLOOR FRAMING SYSTEMS, AS ALLOWABLE.
53. INSTALL BATT INSULATION AT ATTIC RAFTERS. INSTALL BAFFLES TO ALLOW FOR AIR VENTILATION.
54. INSTALL TEMPERED GLASS, AS REQUIRED NEAR TUB OR STAIRS.
55. INSTALL FIRE EXTINGUISHER.
56. CONSERVATORY: INSTALL REPLICA STEPS TO MATCH EXISTING HISTORIC EAST STAIRS. INSTALL GUARD RAILING AND HANDRAILS AT STEPS. REPAIR AND REFINISH WOOD FLOORING.
57. INSTALL APPROPRIATE HISTORIC LIGHT FIXTURE AT ORIGINAL FIXTURE LOCATION.
58. DEMOLISH EXISTING PLUMBING. PATCH AND REPAIR AFFECTED AREAS TO MATCH HISTORIC MATERIALS.
59. INSTALL NEW WOOD FLOORING.
60. REFRESH EXISTING HISTORIC BOARD WALLS AND/OR CEILING, INCLUDING ALL EXPOSED BEAMS, TRIM, AND ACCESSORIES. PRESERVE HISTORIC PATINA.
61. PROVIDE FIRE ESCAPE LADDER AT WINDOW.
62. PROVIDE WOOD STORM/SCREENED DOOR.
63. INFILL EXISTING OPENING IN LOG WALL. STRUCTURALLY INFILL WALL, PER ENGINEER.
64. UTILIZE ALL DUCT CHASES FOR NEW PIPING AND ELECTRICAL CONDUIT.
65. INSTALL REPLICA DOOR TO MATCH HISTORIC DOORS.
66. FIX EXISTING HISTORIC DOOR IN PLACE. DOOR WILL NOT BE OPERABLE.
67. INSTALL INSULATED GYPSUM BOARD ON WALLS AND CEILINGS THROUGHOUT.
68. INSTALL SEALANT AT JOINT BETWEEN WALL AND STEPS.
69. REFURBISH EXISTING FIREPLACE SURROUND AND HEARTH.
70. INSTALL GAS FIREPLACE INSERT.
71. INSTALL NEW TRIM TO REPLICATE HISTORIC TRIM. REFINISH TO MATCH EXISTING HISTORIC TRIM.
72. REPAIR EXISTING TRIM OR REPLACE IN KIND. REFINISH TO MATCH EXISTING HISTORIC TRIM.
73. REUSE EXISTING HISTORIC CLAW FOOT TUB. REFINISH AND RESTORE.
74. CAREFULLY REMOVE HISTORIC PANELING TO INSTALL STRUCTURAL COLUMNS. REINSTALL PANELING IN ORIGINAL LOCATION.
75. STRUCTURAL BEAM ABOVE, REFERENCE STRUCTURAL DRAWINGS.

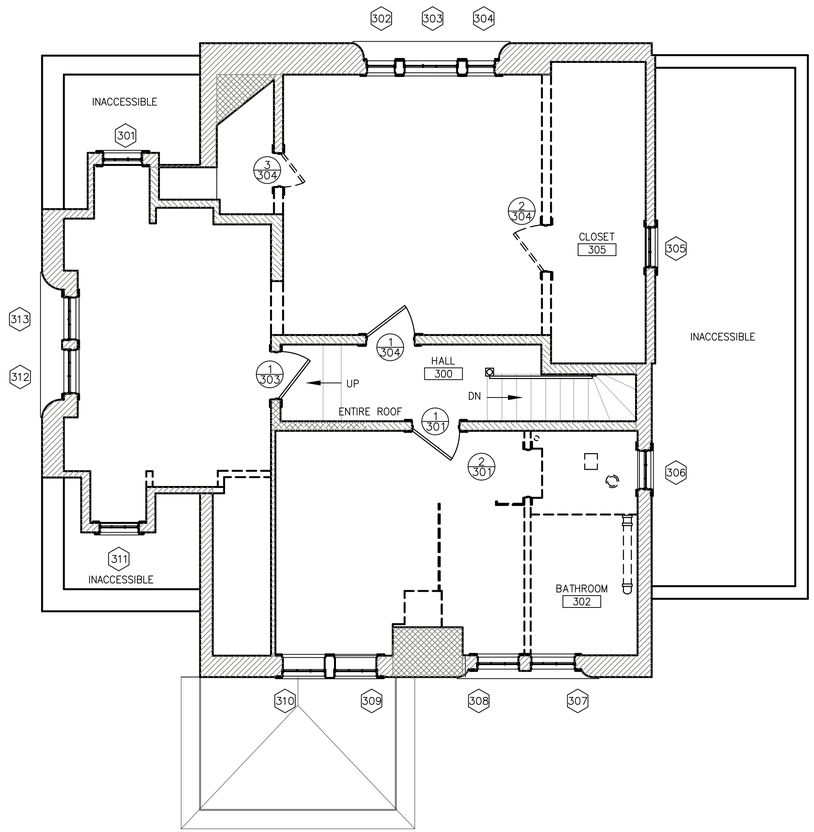
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DATE: 05/07/18

SUB SHEET NO. T A05

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 9 OF 48



1/A06 THIRD FLOOR DEMOLITION PLAN
1/4" = 1'-0"

PROJECT NORTH

DEMOLITION PLAN LEGEND

- TO REMAIN
- TO BE DEMOLISHED
- DOOR TO REMAIN
- DEMOLISH DOOR

KEY

- (#) DRAWING KEY NOTES
- 000 WINDOW NUMBER
- 000/0 DOOR NUMBER
- 000 ROOM NUMBER
- BRICK/STONE WALL
- LOG WALL
- WOOD FRAME WALL

4 0 4 8
SCALE OF FEET

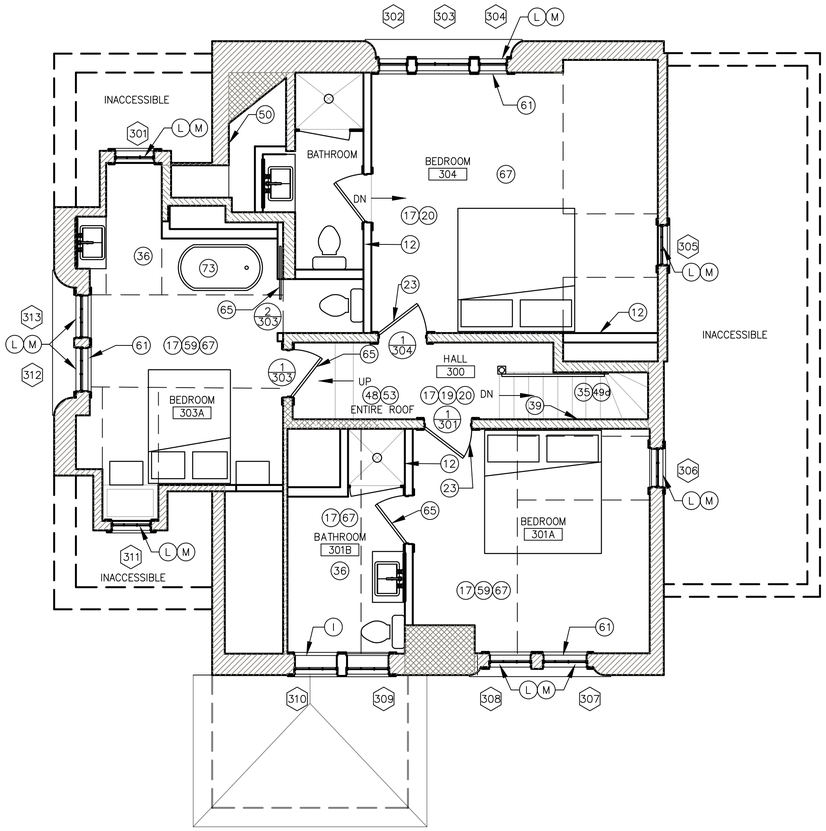
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SUB SHEET NO. T A06

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 10 OF 48



1 A07 THIRD FLOOR PLAN
1/4" = 1'-0"

PROJECT NORTH

4 0 4 8
SCALE OF FEET

KEY	
#	DRAWING KEY NOTES
000	WINDOW NUMBER
000 0	DOOR NUMBER
000	ROOM NUMBER
	BRICK/STONE WALL
	LOG WALL
	WOOD FRAME WALL

KEY NOTES INTERIOR

NOTE: ALPHABETICAL KEY NOTES CAN BE FOUND ON EXTERIOR ELEVATION SHEETS

1. CUT NEW DOOR OPENING IN STONE WALL. INSTALL NEW STEEL LINTEL AND NEW EXTERIOR WOOD PANELED DOOR TO REPLICATE THE EXISTING HISTORIC DOORS AT THE HOUSE. NEW DOOR AND HARDWARE TO COMPLY WITH ADA.
2. INSTALL NEW ADA COMPLIANT CONCRETE RAMP AND NEW HANDRAILS. INSTALL CAST STONE RETAINING WALLS, AS REQUIRED.
3. INSTALL NEW CONCRETE STEPS AND HANDRAIL.
4. REPAIR EXISTING DOOR. INSTALL SIGN INDICATING THE DOOR IS NO LONGER USABLE. RESTORE HARDWARE AND WEATHERSTRIP.
5. INSTALL NEW EXTERIOR WALL MOUNTED LIGHT.
6. REMOVE EXPOSED LATH AND PLASTER, FURR OUT FROM STONE FOUNDATION AND INSTALL NEW BLUE BOARD WITH TWO SKIM COATS TO EMULATE HISTORIC PLASTER (MATCH HISTORIC PLASTER WALL SURFACE).
7. INSTALL FURRING CHANNELS OVER EXISTING MASONRY AND INSTALL NEW GYPSUM BOARD AND WOOD BASEBOARD. INSULATE WALL. RETAIN HISTORIC TRIM.
8. INSTALL REQUIRED FURRING DOWN FROM METAL PAN CEILING TO INSTALL NEW, LEVEL, INSULATED, GYPSUM BOARD CEILING.
9. PREPARE EXISTING CONCRETE FLOOR WITH SEALER AND INSTALL NEW PORCELAIN FLOOR TILES.
10. NEW DEMONSTRATION KITCHEN TO INCLUDE: COMMERCIAL GRADE GAS STOVE AND FIRE SUPPRESSION HOOD (EXHAUST INTO CHIMNEY – INSTALL NEW FIRE-RATED LINER), ISLAND WITH UNDER COUNTER CABINETS, 3-PART COMMERCIAL SINK, DISHWASHER, COMMERCIAL REFRIGERATOR AND FREEZER, CABINETS, COUNTERS, AND BACKSPLASH.
11. REPOINT AND PAINT EXPOSED MASONRY WALLS, AS REQUIRED.
12. CONSTRUCT NEW GYPSUM/WOOD STUD WALL. INSULATE BATHROOM WALLS.
13. REPLACE DETERIORATED STEEL LINTEL AT FIREBOX. REPLACE FRACTURED BRICK, IN KIND. REPOINT FIREPLACE, AS REQUIRED. CLEAN CHIMNEY. INSTALL METAL FLUE LINER. INSTALL GAS FIREPLACE INSERT. PAINT AND REPAIR EXISTING MANTEL.
14. REPLACE AREAWAY DRAIN.
15. RESTORE STEPS. RESTORE ALL MILLWORK, TWO DOORS, AND HARDWARE. INSTALL NEW LIGHT AT STAIR.
16. INSTALL NEW OR REPAIR THRESHOLD.
17. INSULATE JOISTS. INSTALL NEW GYPSUM CEILING BOARD CEILING AND PAINT.
18. INSTALL NEW TASK LIGHTING AT ISLAND.
19. REMOVE FLAKING AND DAMAGED PLASTER AT WALLS. INSTALL NEW WOOD LATH WHERE MISSING AND APPLY NEW PLASTER.
20. LIGHTLY REFINISH HISTORIC WOOD FLOORING. REPAIR, AS REQUIRED, TO MATCH EXISTING.
21. INSTALL BACKSPLASH.
22. REPOINT INTERIOR FACE OF EXTERIOR MASONRY WALLS, AS REQUIRED. INSTALL NEW WATERPROOFING COATING ON INTERIOR SURFACE OF MASONRY AND PAINT. MONITOR FOR MOISTURE INTRUSION. INSTALL CONDITIONED AIR AND VENTILATION.
23. RESTORE HISTORIC DOOR AND HARDWARE TO WORKING CONDITION. REPLACE OR SUPPLEMENT HARDWARE AND HINGES, AS REQUIRED, IN KIND.
24. INSTALL NEW WOOD DOOR TRIM AT CASED OPENING.
25. INSTALL VENTILATION IN CRAWLSPACE. INSTALL VAPOR BARRIER THROUGHOUT. (MAY REQUIRE REMOVAL AND REINSTALLATION OF WOOD FLOORING. INSULATE FLOOR JOISTS.
26. REPLACE MISSING OR DETERIORATED TRIM, IN KIND.
27. INSTALL NEW DOOR AND HARDWARE.
28. PAINT ALL WALLS, CEILINGS, AND TRIM, AS REQUIRED.
29. INSTALL NEW FLOOR DRAIN.
30. REPAIR WALLS AND CEILINGS, AS REQUIRED. PRIME AND PAINT ALL SURFACES.
31. INSTALL NEW GAS-FIRED WATER HEATER IN WATER CLOSET 005C IN THE BASEMENT. PROVIDE COMBUSTION FLUE. COORDINATE WITH EXISTING SOUTH CHIMNEY
32. INSTALL NEW ADA-COMPLIANT RESTROOM IN THE BASEMENT, INCLUDING: TILE FLOOR, TOILET, LAVATORY, GRAB BARS, EXHAUST FAN, AND ALL REQUIRED ACCESSORIES.
33. INSTALL NEW HOSE BIBB.
34. INSTALL NEW STRUCTURAL STEEL COLUMNS AND FOOTING, AS REQUIRED BY STRUCTURAL. BOX AROUND COLUMNS FOR FINISHED APPEARANCE.
35. REPAIR TREAD NOSING.
36. INSTALL A TOTAL OF FIVE NEW BATHROOMS ON SECOND AND THIRD FLOOR LEVELS, EACH TO INCLUDE: TOILET, SINK/VANITY, TUB AND/OR SHOWER, EXHAUST FAN, AND ALL REQUIRED ACCESSORIES.
37. FURR OUT EXISTING WALL TO CREATE NEW DUCT CHASE FOR HVAC AND PLUMBING. INSULATE.
38. LIGHTLY REFINISH ALL STAIR AND RELATED COMPONENTS. PRESERVE PATINA.
39. INSTALL NEW RAILING AT STEPS.
40. INSTALL LINTEL AT ROOM 002 DOOR 1/002.
41. ROOM 006 UNDER EAST STEPS – UNDERPIN OR MUD JACK WALL AND REPOINT OPEN MORTAR JOINTS.
42. FIRST FLOOR FRAMING: UPON REMOVAL OF BASEMENT CEILING IN ITS ENTIRETY, INSPECT EACH FLOOR JOIST AND REPLACE, AS REQUIRED. RE-EVALUATE REMOVAL OF STEEL BEAMS AT THIS TIME. PLAN IS TO REMOVE THE SOUTH TWO BEAMS AND RELATED POSTS. PATCH FLOOR/WALLS, AS REQUIRED, IN KIND. NORTHERNMOST BEAM TO REMAIN.
43. SECOND FLOOR FRAMING: INSTALL SUPPLEMENTAL FRAMING TO REDUCE SPANS OF E/W SECOND FLOOR FRAMING,
    a. ROOM 101: REMOVE EXISTING SUPPLEMENTAL BEAMS INSTALLED IN THE 1960S AND ALL RELATED ACCESSORIES FROM THIS SPACE. REMOVE EXISTING CEILING IN ITS ENTIRETY (COORDINATE WITH ASBESTOS ABATEMENT). PROVIDE SHORING DURING CONSTRUCTION, AS REQUIRED. INSPECT ALL EXPOSED SECOND FLOOR FRAMING, REPAIR/REPLACE, AS REQUIRED. CUT EXISTING BEAMS IN ORDER TO INSTALL TWO W8X21 A992 STEEL MEMBERS (NORTH/SOUTH), ONE ON EITHER SIDE OF FIREPLACE. INSTALL TOTAL (3) THREE STEEL POSTS INSIDE CENTER WALL, TO BEAR ON EXISTING STEEL BEAM BELOW. INSTALL STIFFENER PLATES AT EXISTING BEAM WHERE POSTS WILL BE LOCATED. NEW N/S BEAMS SHALL TIE INTO CENTER POST LOCATIONS. REFER TO STRUCTURAL REPAIR PLANS AND DETAILS. INSTALL BEARING PLATES IN NOTCHED LOG WALLS TO SUPPORT NEW BEAMS. COORDINATE DETAIL, DEPENDENT UPON LOCATION AND FIELD CONDITIONS. INCORPORATE NEW POSTS AND STEEL MEMBERS WITHIN CENTER WALL, IF POSSIBLE.
    b. ROOM 104: INSTALL NEW SUPPLEMENTAL W8X21 A992 STEEL MEMBERS (NORTH/SOUTH), PER STRUCTURAL REPAIR PLANS AND DETAILS. CLAD NEW N/S MEMBERS WITH WOOD TRIM TO EMULATE BEAM.
44. THIRD FLOOR FRAMING: UTILIZE STEEL BEAMS TO REDUCE SPANS, PER STRUCTURAL PLANS AND DETAILS. INSTALL CENTRAL BEAM AND POSTS ABOVE SECOND FLOOR FRAMING TO CREATE A DIRECT LOAD PATH TO THE FOUNDATION.
45. ROOM 200: INSTALL NEW JOISTS ON EITHER SIDE OF ROTTED E/W CEILING TIMBER.
46. INSPECT ENDS OF ALL THIRD FLOOR CEILING TIMBER JOISTS ONCE CEILING IS REMOVED FROM SECOND FLOOR. SISTER OR REPLACE, AS REQUIRED.
47. ROOM 201: RETAIN EXISTING EXPOSED CEILING TIMBERS. REPLACE ROTTED BEAM WHERE DETERIORATED AT EAST WALL. INSTALL SUPPLEMENTAL FLOOR FRAMING. DIFFERENTIATE FROM HISTORIC CEILING TIMBERS.
48. ROOF FRAMING: EXISTING ROOF FRAMING IS BURNED AND DETERIORATED AND IS COMPOSED OF AT LEAST TWO DIFFERENT ROOF FRAMING SYSTEMS. RECOMMENDED TREATMENT IS TO RE-FRAME ENTIRE ROOF STRUCTURE. WORK TO BE PERFORMED BY A DESIGN/BUILD ROOFING CONTRACTOR AND OVERSEEN BY A STRUCTURAL ENGINEER. HISTORIC LOG RAFTERS MAY BE ABLE TO BE PRESERVED AS PART OF THE RE-ROOFING EFFORTS, BUT NOT UTILIZED IN A STRUCTURAL CAPACITY. COORDINATE WITH ABATEMENT OF ASBESTOS ROOFING UNDERLAYMENT.
49. INTERIOR STAIRS:
    a. STAIRS FROM BASEMENT TO FIRST FLOOR: REPLACE 4-INCH SQUARE WOOD POST WITH STEEL POST AND NEW CONCRETE ROOFING.
    b. CUT BASE OF WOOD POST AT FIRST FLOOR TO ALLOW FOR INSERTION OF STEEL BEAM TO SPAN FROM EXTERIOR WALL TO TOP OF NEW STEEL POST. UP-SET STEEL BEAM FROM FIRST FINISH FLOOR, TO ALLOW HEAD ROOM TO PASS AT THE STAIRS. THIS WILL REQUIRE MODIFICATION OF BALUSTERS AND DOOR TO CLOSET UNDER STAIRS. CLAD STEEL IN WOOD CASEWORK.
    c. REPAIR STAIR TREADS FROM BASEMENT TO FIRST FLOOR.
    d. STAIR FROM SECOND FLOOR TO THIRD FLOOR: CAREFULLY REMOVE EXISTING MILLWORK ON UNDERSIDE OF STAIR. INSTALL ADDITIONAL INTERIOR STRINGERS OR REINFORCE UNDERSIDE WITH STEEL ANGLE. REINSTALL MILLWORK IN ORIGINAL LOCATIONS AFTER PERFORMING WORK.
50. REPLACE TOP LOGS AT WEST SIDE OF HOUSE.
51. INFILL MISSING WOOD PANELING AND CHAIR RAIL WITH REPLICA TO MATCH THE EXISTING.
52. INSTALL SOUND ATTENUATION BATT INSULATION IN ALL WALLS SURROUNDING BATHROOMS. INSTALL SOUND ATTENUATION BATT INSULATION AT ALL FLOOR FRAMING SYSTEMS, AS ALLOWABLE.
53. INSTALL BATT INSULATION AT ATTIC RAFTERS. INSTALL BAFFLES TO ALLOW FOR AIR VENTILATION.
54. INSTALL TEMPERED GLASS, AS REQUIRED NEAR TUB OR STAIRS.
55. INSTALL FIRE EXTINGUISHER.
56. CONSERVATORY: INSTALL REPLICA STEPS TO MATCH EXISTING HISTORIC EAST STAIRS. INSTALL GUARD RAILING AND HANDRAILS AT STEPS. REPAIR AND REFINISH WOOD FLOORING.
57. INSTALL APPROPRIATE HISTORIC LIGHT FIXTURE AT ORIGINAL FIXTURE LOCATION.
58. DEMOLISH EXISTING PLUMBING. PATCH AND REPAIR AFFECTED AREAS TO MATCH HISTORIC MATERIALS.
59. INSTALL NEW WOOD FLOORING.
60. REFRESH EXISTING HISTORIC BOARD WALLS AND/OR CEILING, INCLUDING ALL EXPOSED BEAMS, TRIM, AND ACCESSORIES. PRESERVE HISTORIC PATINA.
61. PROVIDE FIRE ESCAPE LADDER AT WINDOW.
62. PROVIDE WOOD STORM/SCREENED DOOR.
63. INFILL EXISTING OPENING IN LOG WALL. STRUCTURALLY INFILL WALL, PER ENGINEER.
64. UTILIZE ALL DUCT CHASES FOR NEW PIPING AND ELECTRICAL CONDUIT.
65. INSTALL REPLICA DOOR TO MATCH HISTORIC DOORS.
66. FIX EXISTING HISTORIC DOOR IN PLACE. DOOR WILL NOT BE OPERABLE.
67. INSTALL INSULATED GYPSUM BOARD ON WALLS AND CEILINGS THROUGHOUT.
68. INSTALL SEALANT AT JOINT BETWEEN WALL AND STEPS.
69. REFURBISH EXISTING FIREPLACE SURROUND AND HEARTH.
70. INSTALL GAS FIREPLACE INSERT.
71. INSTALL NEW TRIM TO REPLICATE HISTORIC TRIM. REFINISH TO MATCH EXISTING HISTORIC TRIM.
72. REPAIR EXISTING TRIM OR REPLACE IN KIND. REFINISH TO MATCH EXISTING HISTORIC TRIM.
73. REUSE EXISTING HISTORIC CLAW FOOT TUB. REFINISH AND RESTORE.
74. CAREFULLY REMOVE HISTORIC PANELING TO INSTALL STRUCTURAL COLUMNS. REINSTALL PANELING IN ORIGINAL LOCATION.
75. STRUCTURAL BEAM ABOVE, REFERENCE STRUCTURAL DRAWINGS.

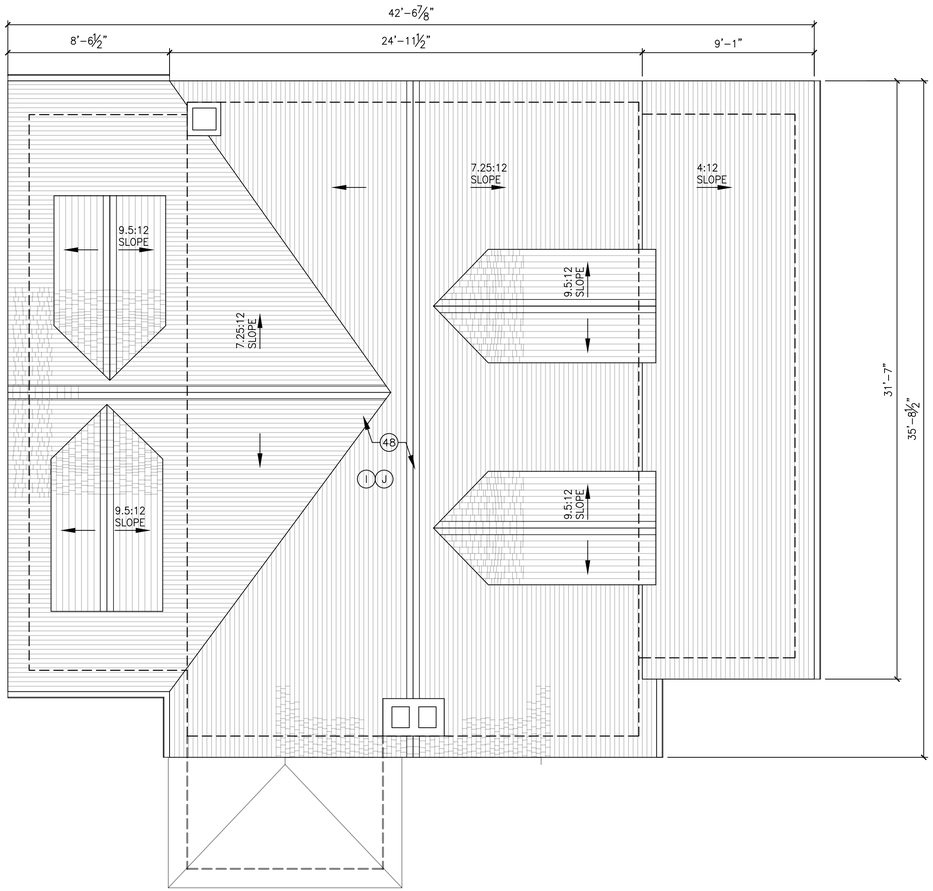
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DESIGNED: CA
CADD: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T A07

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 11 OF 48



1 A08 ROOF PLAN
1/4" = 1'-0"

PROJECT NORTH

4 0 4 8
SCALE OF FEET

KEY NOTES INTERIOR

NOTE: ALPHABETICAL KEY NOTES CAN BE FOUND ON EXTERIOR ELEVATION SHEETS

1. CUT NEW DOOR OPENING IN STONE WALL. INSTALL NEW STEEL LINTEL AND NEW EXTERIOR WOOD PANELED DOOR TO REPLICATE THE EXISTING HISTORIC DOORS AT THE HOUSE. NEW DOOR AND HARDWARE TO COMPLY WITH ADA.
2. INSTALL NEW ADA COMPLIANT CONCRETE RAMP AND NEW HANDRAILS. INSTALL CAST STONE RETAINING WALLS, AS REQUIRED.
3. INSTALL NEW CONCRETE STEPS AND HANDRAIL.
4. REPAIR EXISTING DOOR. INSTALL SIGN INDICATING THE DOOR IS NO LONGER USABLE. RESTORE HARDWARE AND WEATHERSTRIP.
5. INSTALL NEW EXTERIOR WALL MOUNTED LIGHT.
6. REMOVE EXPOSED LATH AND PLASTER, FURR OUT FROM STONE FOUNDATION AND INSTALL NEW BLUE BOARD WITH TWO SKIM COATS TO EMULATE HISTORIC PLASTER (MATCH HISTORIC PLASTER WALL SURFACE).
7. INSTALL FURRING CHANNELS OVER EXISTING MASONRY AND INSTALL NEW GYPSUM BOARD AND WOOD BASEBOARD. INSULATE WALL. RETAIN HISTORIC TRIM.
8. INSTALL REQUIRED FURRING DOWN FROM METAL PAN CEILING TO INSTALL NEW, LEVEL, INSULATED, GYPSUM BOARD CEILING.
9. PREPARE EXISTING CONCRETE FLOOR WITH SEALER AND INSTALL NEW PORCELAIN FLOOR TILES.
10. NEW DEMONSTRATION KITCHEN TO INCLUDE: COMMERCIAL GRADE GAS STOVE AND FIRE SUPPRESSION HOOD (EXHAUST INTO CHIMNEY – INSTALL NEW FIRE-RATED LINER), ISLAND WITH UNDER COUNTER CABINETS, 3-PART COMMERCIAL SINK, DISHWASHER, COMMERCIAL REFRIGERATOR AND FREEZER, CABINETS, COUNTERS, AND BACKSPLASH.
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    d. STAIR FROM SECOND FLOOR TO THIRD FLOOR: CAREFULLY REMOVE EXISTING MILLWORK ON UNDERSIDE OF STAIR. INSTALL ADDITIONAL INTERIOR STRINGERS OR REINFORCE UNDERSIDE WITH STEEL ANGLE. REINSTALL MILLWORK IN ORIGINAL LOCATIONS AFTER PERFORMING WORK.
50. REPLACE TOP LOGS AT WEST SIDE OF HOUSE.
51. INFILL MISSING WOOD PANELING AND CHAIR RAIL WITH REPLICA TO MATCH THE EXISTING.
52. INSTALL SOUND ATTENUATION BATT INSULATION IN ALL WALLS SURROUNDING BATHROOMS. INSTALL SOUND ATTENUATION BATT INSULATION AT ALL FLOOR FRAMING SYSTEMS, AS ALLOWABLE.
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75. STRUCTURAL BEAM ABOVE, REFERENCE STRUCTURAL DRAWINGS.

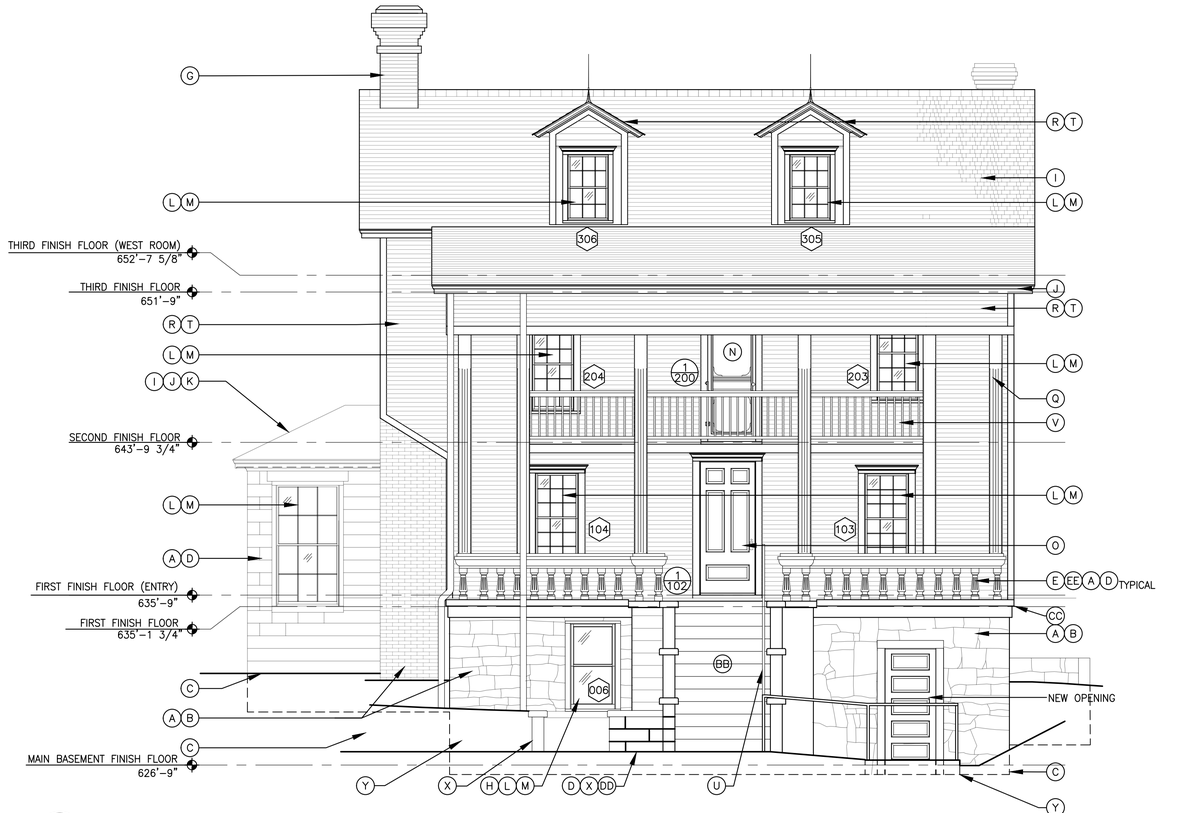
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DESIGNED: CA
CADD: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T A08

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 12 OF 48



1 A09 EAST ELEVATION
1/4" = 1'-0"

KEY

(#)	DRAWING KEY NOTES
000	WINDOW NUMBER
000 / 0	DOOR NUMBER
000	ROOM NUMBER

KEY NOTES EXTERIOR

NOTE: NUMERICAL KEY NOTES CAN BE FOUND ON FLOOR PLAN SHEETS

MASONRY:

A. CLEAN MASONRY AND CAST STONE WITH GENTLEST MEANS POSSIBLE. START CLEANING SAMPLES WITH DETERGENT AND HOT WATER SCRUBBING. UTILIZE CHEMICALS AS LAST RESORT.

B. PERFORM MISCELLANEOUS REPOINTING TO MATCH THE EXISTING HISTORIC MORTAR. MATCH COLOR, HARDNESS, AGGREGATE, AND TOOLING PATTERN.

C. EXCAVATE FOUNDATION AND INSTALL PERIMETER FRENCH DRAIN AND WATERPROOFING ON EXTERIOR OF FOUNDATION WALL BELOW GRADE. COAT FOUNDATION WALL WITH LOW-STRENGTH CEMENTITIOUS PARGE COATING. INSTALL BENTONITE WATERPROOFING SHEETS AND PROTECTION BOARD. INSTALL OPEN GRADED CRUSHED STONE ROCK CHIMNEY BACKFILLED AGAINST BENTONITE SHEETS AND WRAPPED IN FILTER FABRIC. BALANCE OF BACKFILL CAN CONSIST OF SOIL, COMPACTED TO 95% OF A STANDARD PROCTOR. INCORPORATE A FOOTING DRAIN INTO ROCK CHIMNEY AND DAYLIGHT EAST TOWARDS THE RAVINE. BACKFILL SHOULD BE PERFORMED WITH LIGHT EQUIPMENT AND IN SUCH A MANNER TO ENSURE COMPACTION WITHOUT IMPARTING EXCESSIVE FORCE ON THE MASONRY WALLS. INCORPORATE DOWNSPOUT DRAINAGE BOOTS INTO A HIGHER SOLID PVC PIPE WITHIN THE ROCK CHIMNEY, ALSO DAYLIGHTED AT A HIGHER ELEVATION TOWARDS THE RAVINE.

D. REPOINT 100% OF THE CAST STONE WALLS AND PORCH ELEMENTS.

E. REPLACE DAMAGED CAST STONE TO MATCH THE EXISTING UNITS. IF UNITS ARE NOT SEVERELY DAMAGED, THEY MAY BE PATCHED WITH A PRESERVATION MORTAR, COLORED AND WITH AGGREGATE TO MATCH THE EXISTING HISTORIC CAST STONE.

F. NORTHWEST CHIMNEY ABOVE THE ROOFLINE REQUIRES REPOINTING. INSTALL ALUMINUM CAP TO BE COORDINATED WITH VENTING FOR GAS INSERT FIREPLACE IN BASEMENT.

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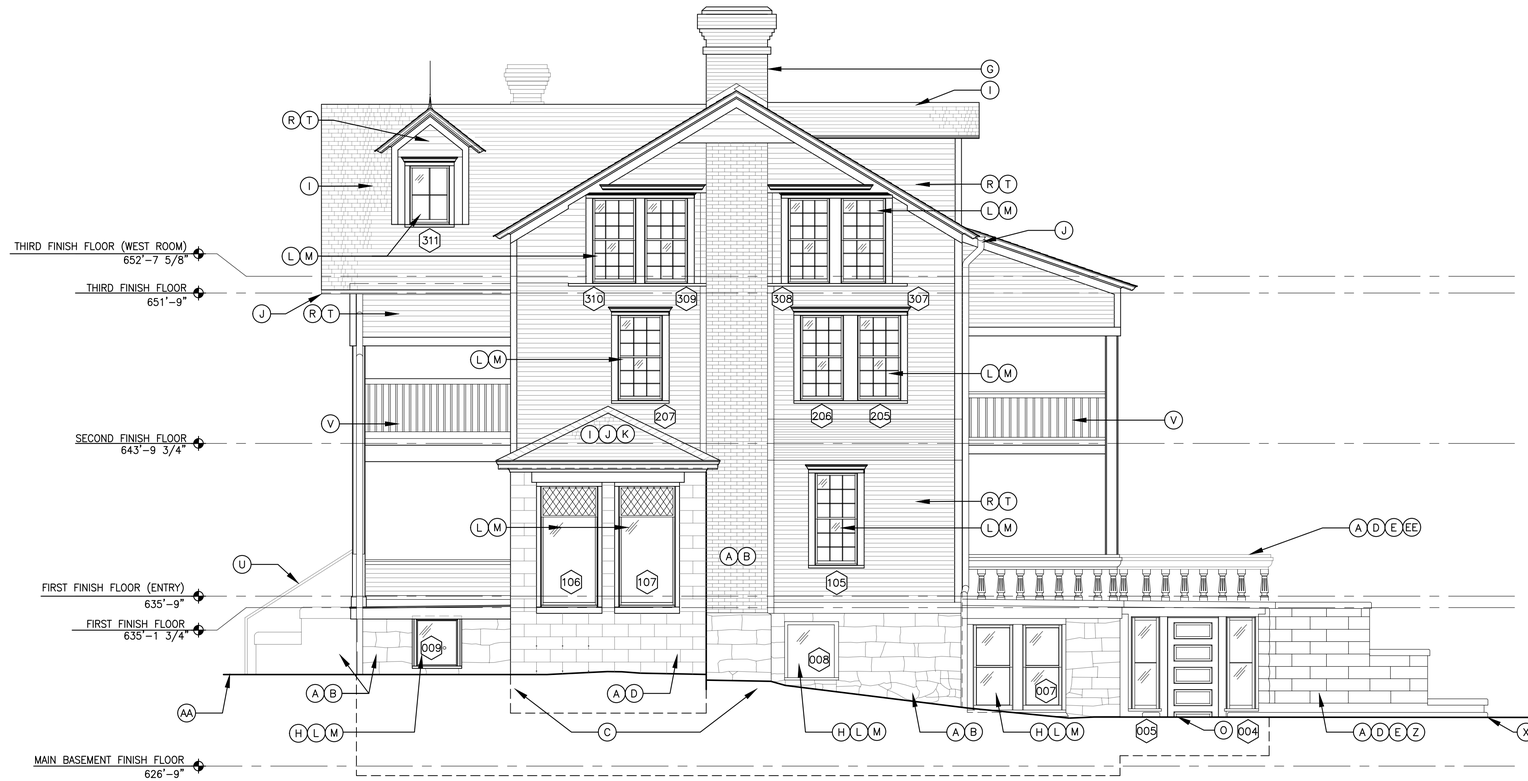
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www.strata-arch.com

DESIGNED: CA
DRAWN: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T / A09

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
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INDIANA DUNES NATIONAL LAKESHORE
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DRAWING NO. 626 / 138617
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SHEET 13 OF 48



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SCALE OF FEET

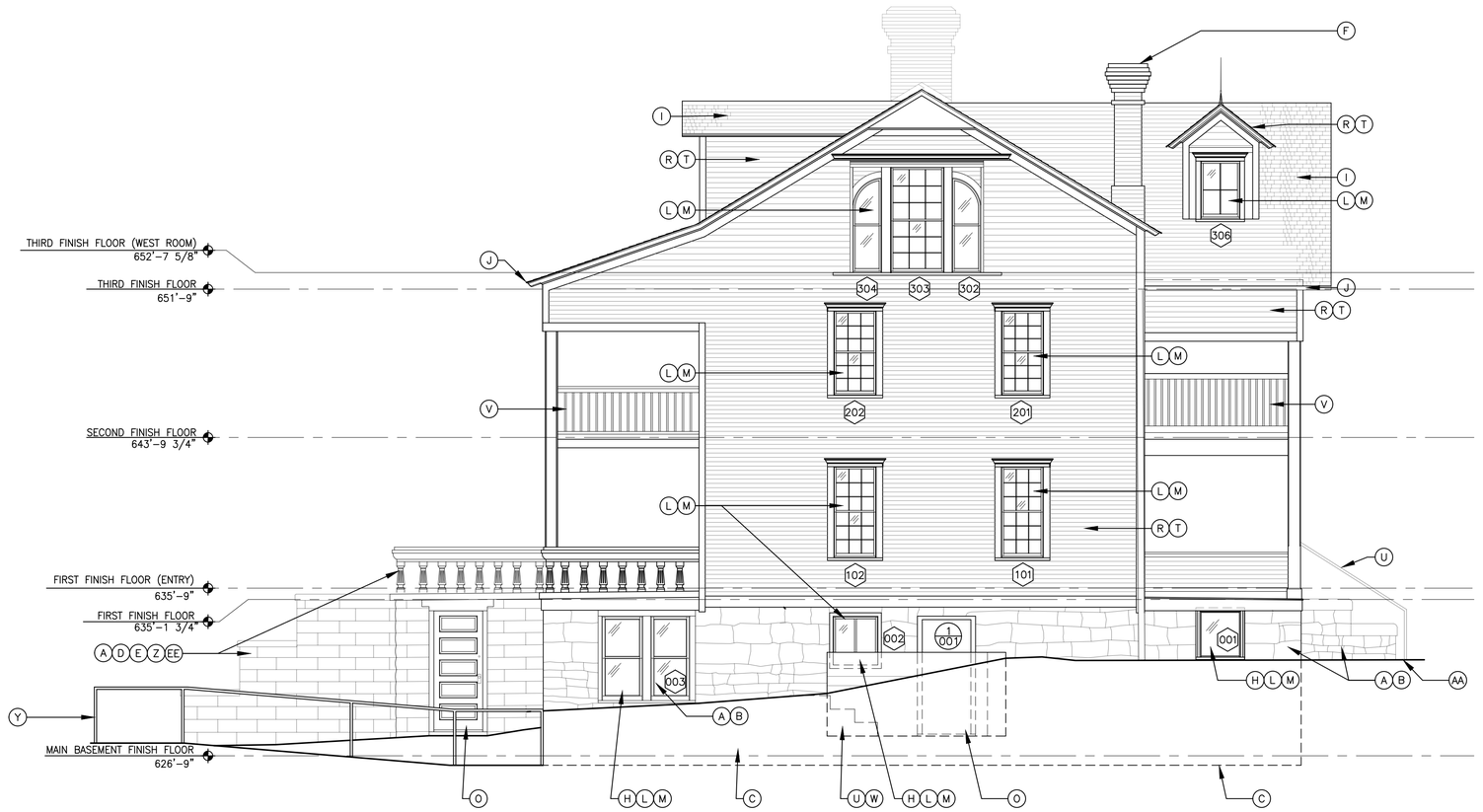
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DESIGNED: CA
CADD: CA
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DRAWING NO. 626 138617
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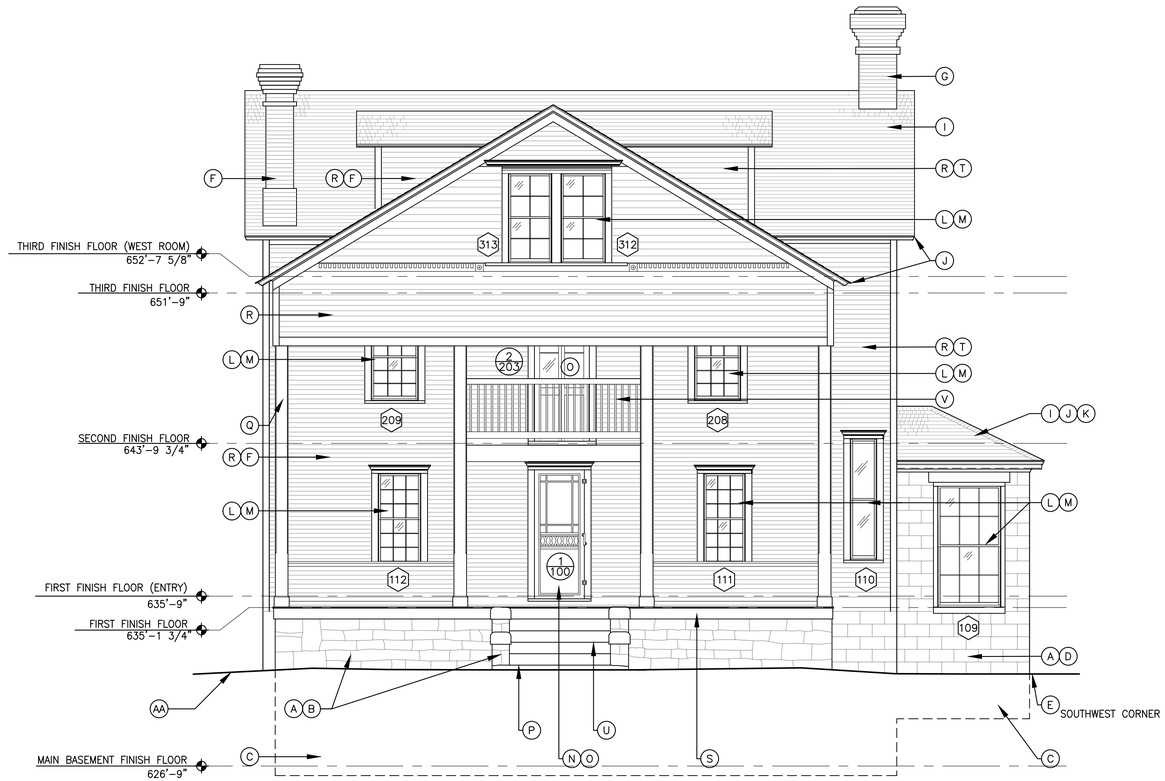
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DESIGNED: CA
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SUB SHEET NO. T A11

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U. INSTALL PAINTED GALVANIZED STEEL HANDRAIL.

V. REPLACE DETERIORATED RAILINGS TO MEET CURRENT BUILDING CODE HEIGHT AND LOADING.

W. REPLACE OR RE-SET STONES SERVING AS TOP TREAD OF AREAWAY TO PLUMB CONDITION.

X. RECONSTRUCT CAST STONE WALLS, AS REQUIRED TO PLUMB CONDITION. REPLACE DAMAGED OR DETERIORATED UNITS, IN KIND. COORDINATE WITH CONSTRUCTION OF NEW RAMPS, RETAINING WALLS, AND STEPS.

Y. INSTALL NEW RAMP, RETAINING WALLS, STEPS, AND RAILINGS, PER PLANS.

Z. INSTALL BACKER ROD AND JOINT SEALANTS AT EAST STEPS. INSTALL WEEPS AT HEAD JOINTS OF CMU WALLS NEAR THE BASE OF EITHER SIDE OF THE STAIRS.

AA. RE-GRADE A HOUSE TO CREATE POSITIVE SLOPE AWAY FROM THE FOUNDATION. INSTALL SLIGHT SWALE ALONG WEST ELEVATION, IF REQUIRED.

BB. REPAIR CONCRETE STEPS. CLEAN AND INSTALL SEALER.

CC. CLEAN AND SEAL CONCRETE DECK.

DD. INSTALL DRAIN IN PLANTER.

EE. CONSIDER INSTALLATION OF SUPPLEMENTAL GUARD RAILING TO MEET CURRENT CODE REQUIREMENTS.

KEY	
#	DRAWING KEY NOTES
000	WINDOW NUMBER
000 / 0	DOOR NUMBER
000	ROOM NUMBER

4 0 4 8
SCALE OF FEET

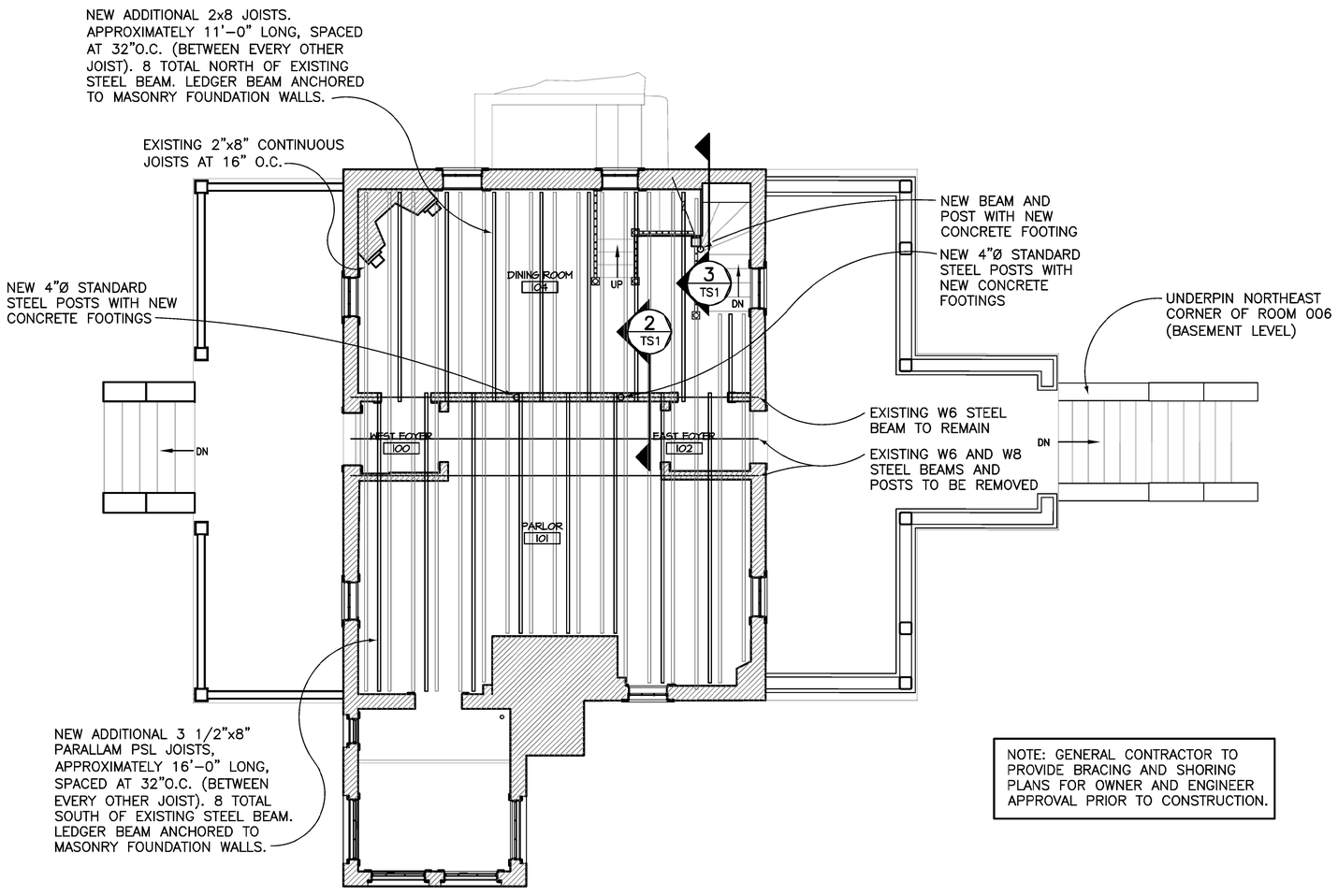
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TECH. REVIEW: AG
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SUB SHEET NO. T / A12

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 16 OF 48

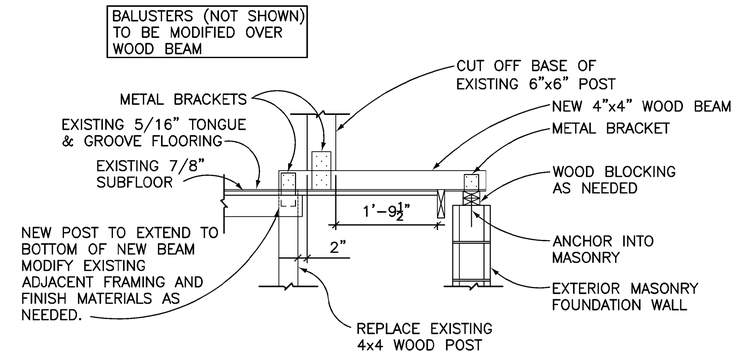


NOTE: GENERAL CONTRACTOR TO PROVIDE BRACING AND SHORING PLANS FOR OWNER AND ENGINEER APPROVAL PRIOR TO CONSTRUCTION.

1/TS1 FIRST FLOOR FRAMING PLAN
1/4" = 1'–0"

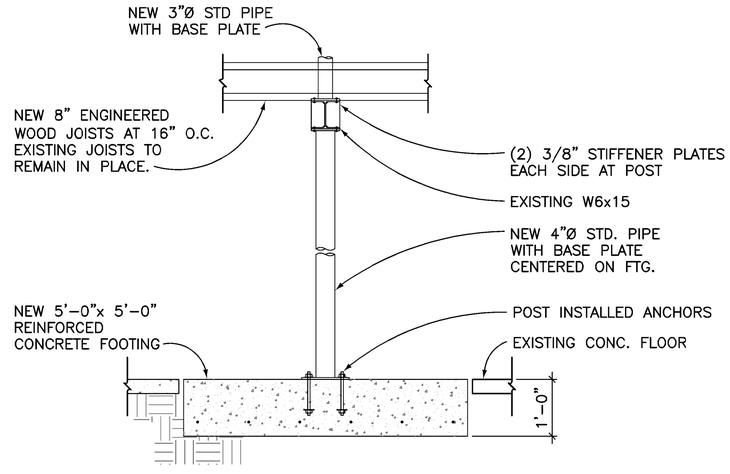
4 0 4 8
SCALE OF FEET

PROJECT NORTH



3/TS1 DETAIL AT BASEMENT STAIRS
3/4" = 1'–0"

1 0 1 2 3
SCALE OF FEET



2/TS1 DETAIL AT NEW POST
3/4" = 1'–0"

1 0 1 2 3
SCALE OF FEET

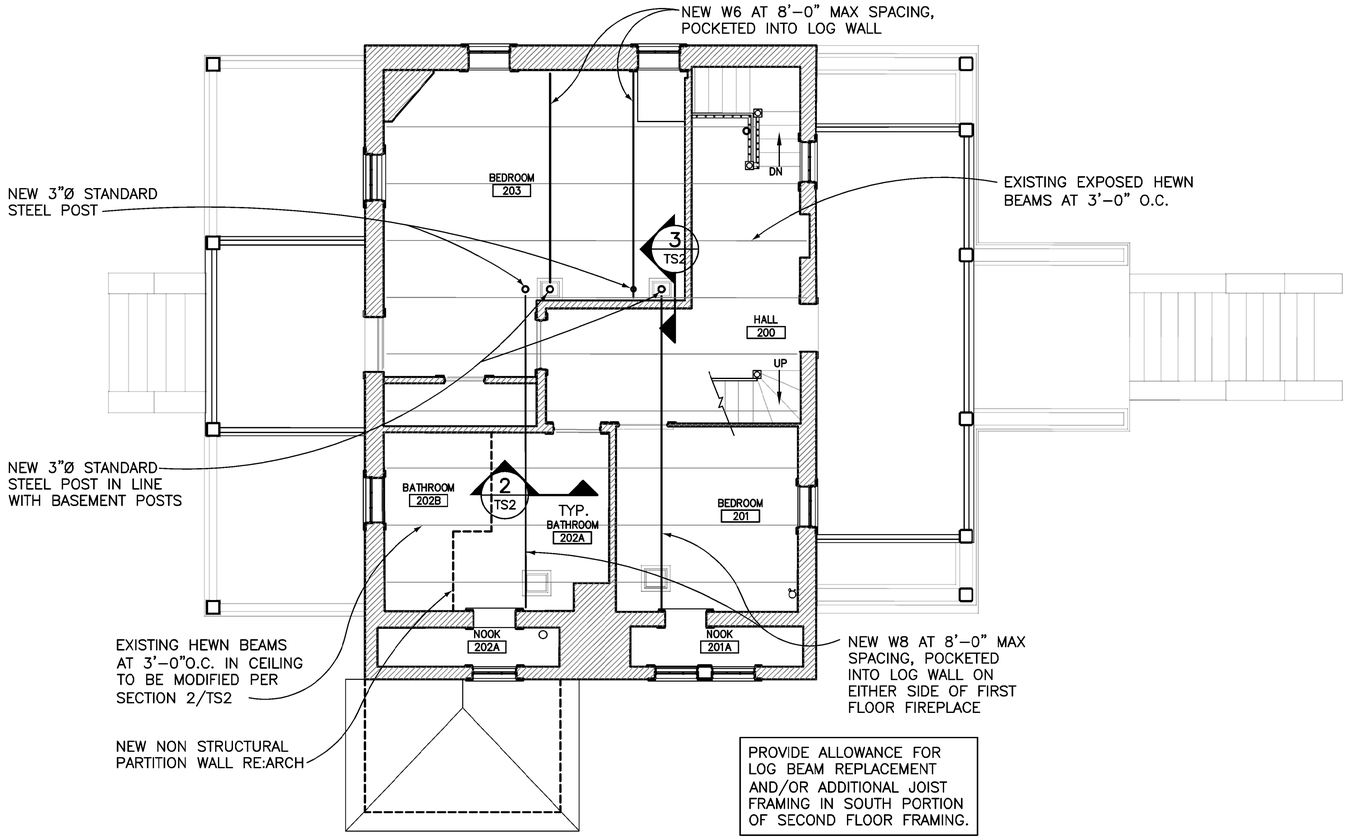
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CADD: CMS
TECH. REVIEW:
DATE: 05/07/18

SUB SHEET NO. T S1

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS–18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

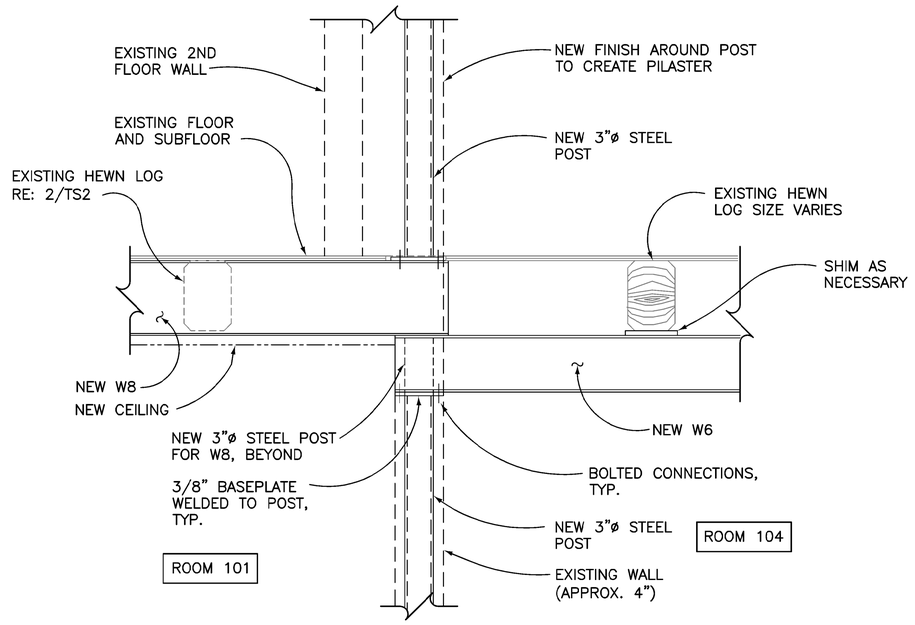
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PMIS/PKG NO. 20940
SHEET 17 OF 48



1 TS2 SECOND FLOOR FRAMING PLAN
1/4" = 1'–0"

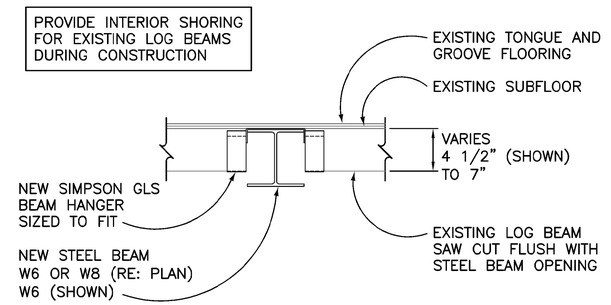
4 0 4 8
SCALE OF FEET

PROJECT NORTH



3 TS2 SECTION AT POST, SECOND FLOOR FRAMING
1 1/2" = 1'–0"

PROVIDE INTERIOR SHORING FOR EXISTING LOG BEAMS DURING CONSTRUCTION



2 TS2 SECTION AT TIMBER TO STEEL CONNECTION
1 1/2" = 1'–0"

12 6 0 12
SCALE OF INCHES

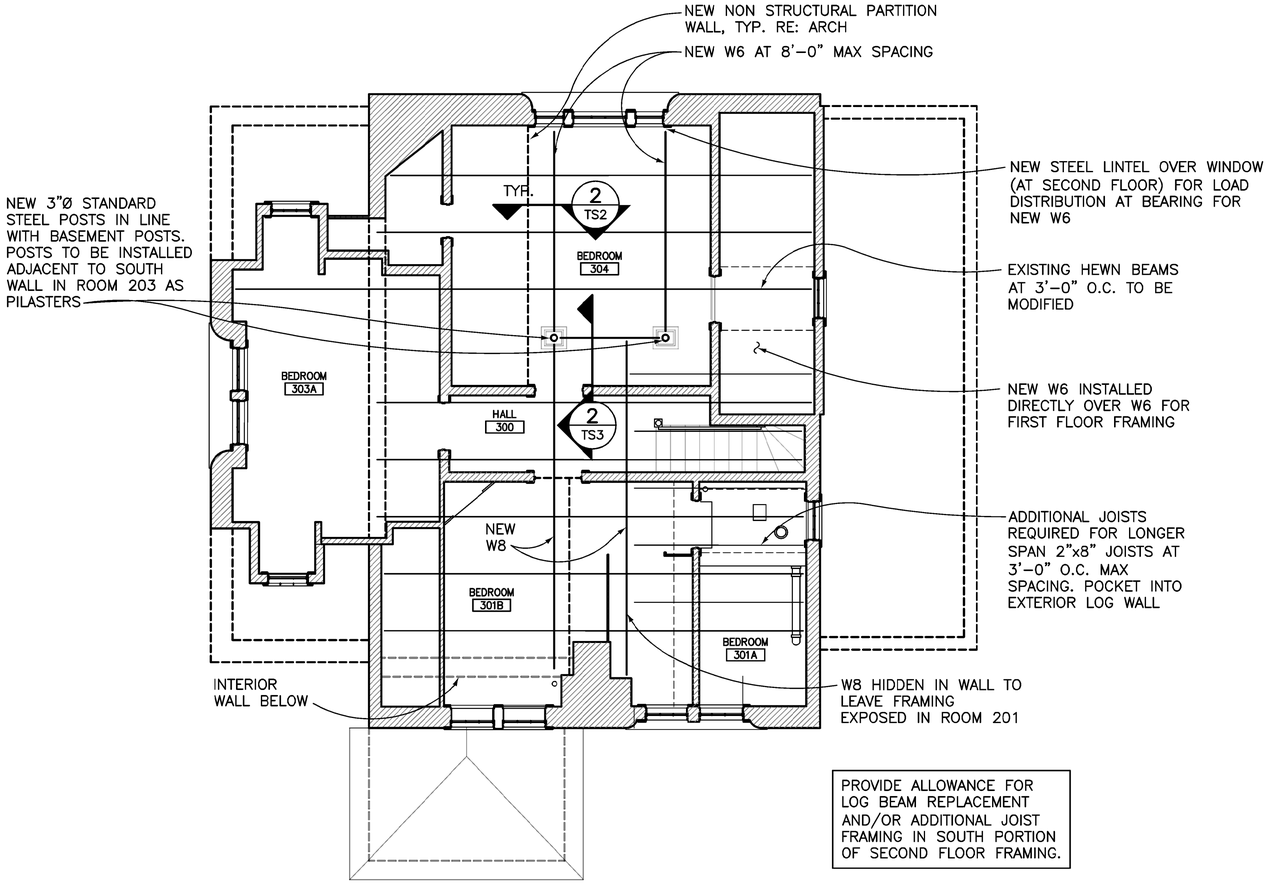
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SUB SHEET NO. I S2

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS–18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 18 OF 48

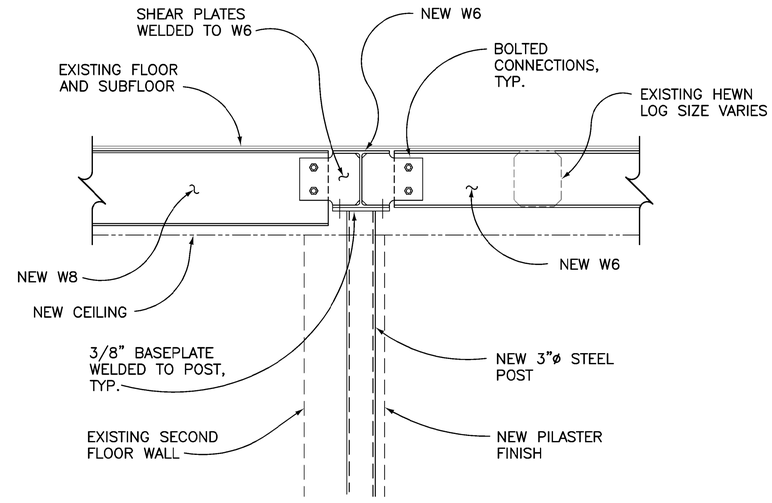


PROVIDE ALLOWANCE FOR LOG BEAM REPLACEMENT AND/OR ADDITIONAL JOIST FRAMING IN SOUTH PORTION OF SECOND FLOOR FRAMING.

1 / TS3 THIRD FLOOR FRAMING PLAN
1/4" = 1'–0"

4 0 4 8
SCALE OF FEET

PROJECT NORTH



2 / TS3 SECTION AT POST, THIRD FLOOR FRAMING
1 1/2" = 1'–0"

12 6 0 12
SCALE OF INCHES

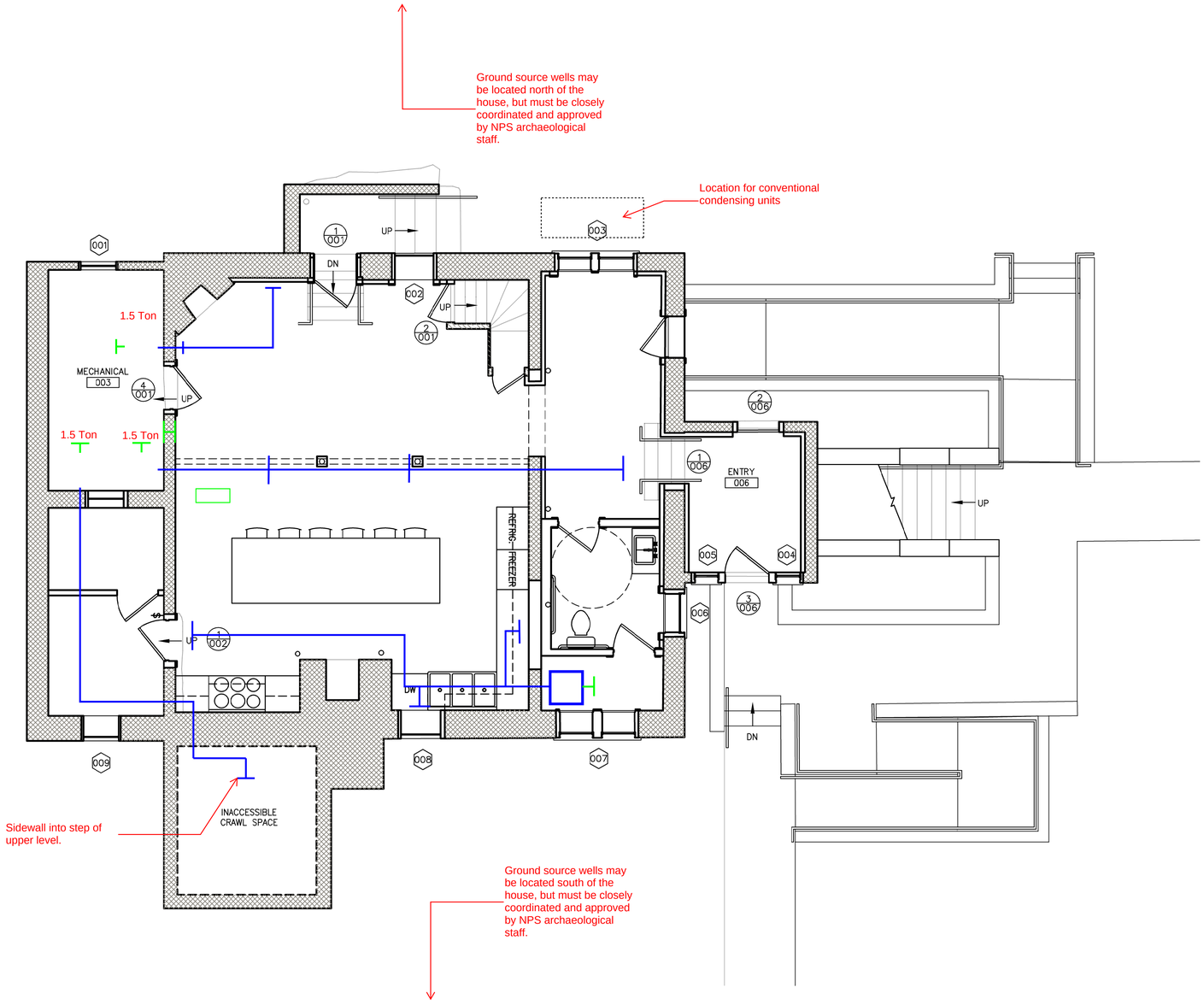
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SUB SHEET NO. T S3

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS–18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 19 OF 48



1/M1 BASEMENT FLOOR PLAN
1/4" = 1'-0"

PROJECT NORTH

KEY

- SUPPLY AIR DIFFUSER
- RETURN AIR
- DUCT
- FAN COIL UNIT
- WALL MOUNTED UNIT
- FLOOR MOUNTED UNIT

4 0 4 8
SCALE OF FEET

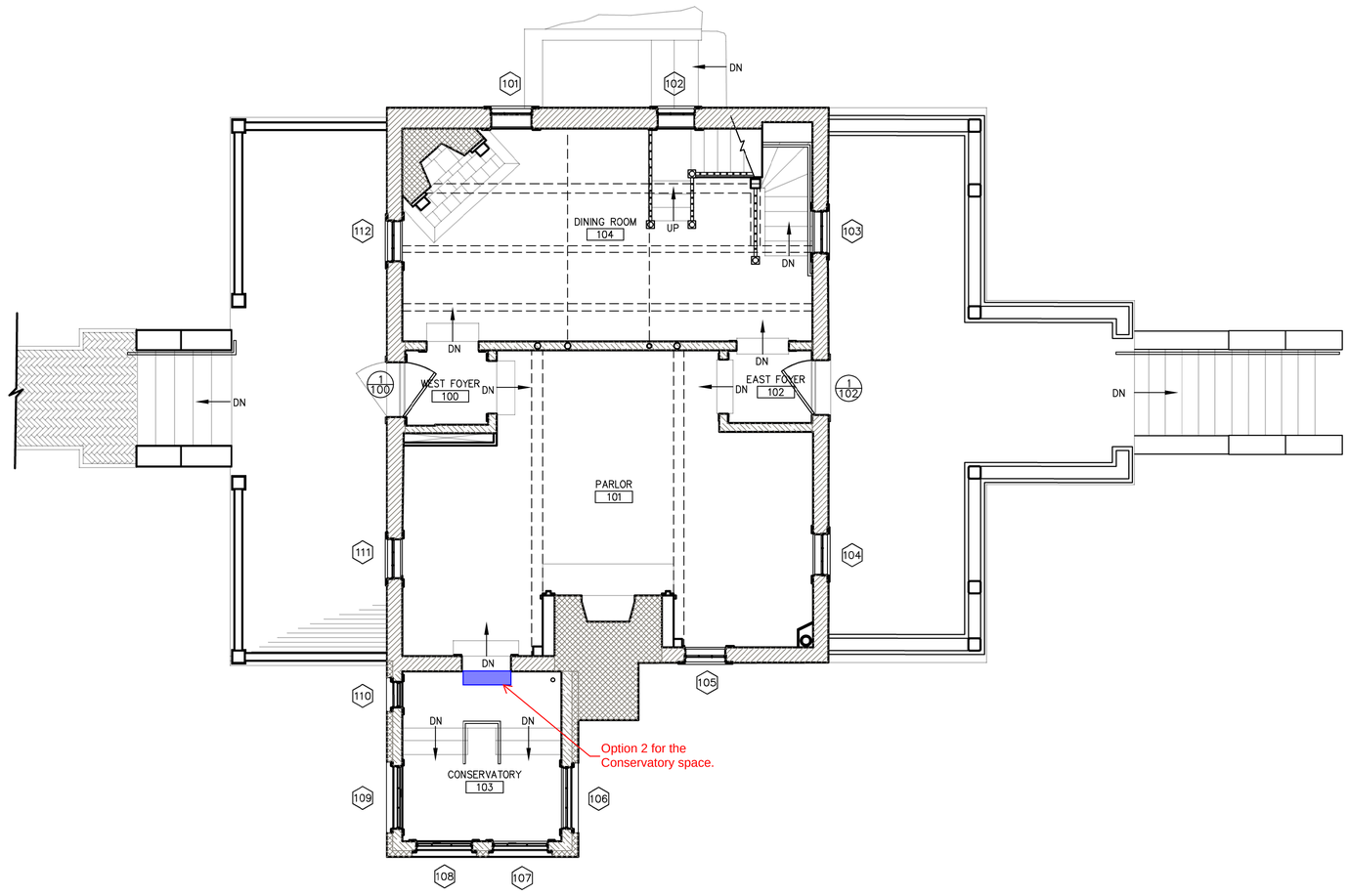
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SUB SHEET NO. T / M1

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
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MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 18 OF 48



1 / M2 FIRST FLOOR PLAN
1/4" = 1'-0"

PROJECT NORTH

KEY	
T	SUPPLY AIR DIFFUSER
T	RETURN AIR
	DUCT
	FAN COIL UNIT
	WALL MOUNTED UNIT
	FLOOR MOUNTED UNIT

4 0 4 8
SCALE OF FEET

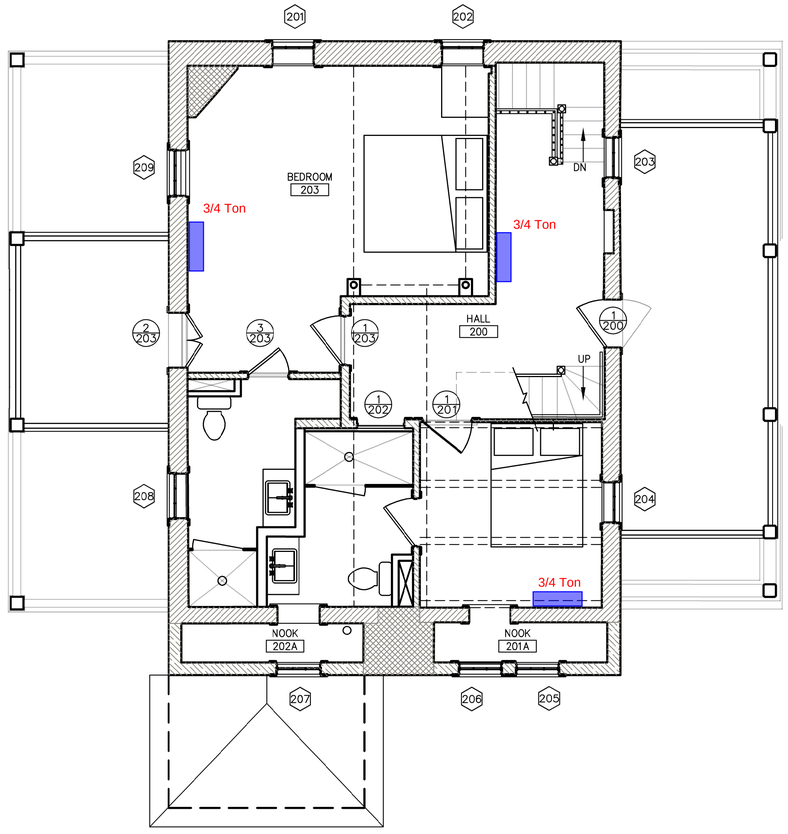
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SUB SHEET NO. T M2

TITLE OF SHEET
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HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
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DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 21 OF 48



1 / M3 SECOND FLOOR PLAN
1/4" = 1'-0"

PROJECT NORTH

KEY

- SUPPLY AIR DIFFUSER
- RETURN AIR
- DUCT
- FAN COIL UNIT
- WALL MOUNTED UNIT
- FLOOR MOUNTED UNIT

4 0 4 8
SCALE OF FEET

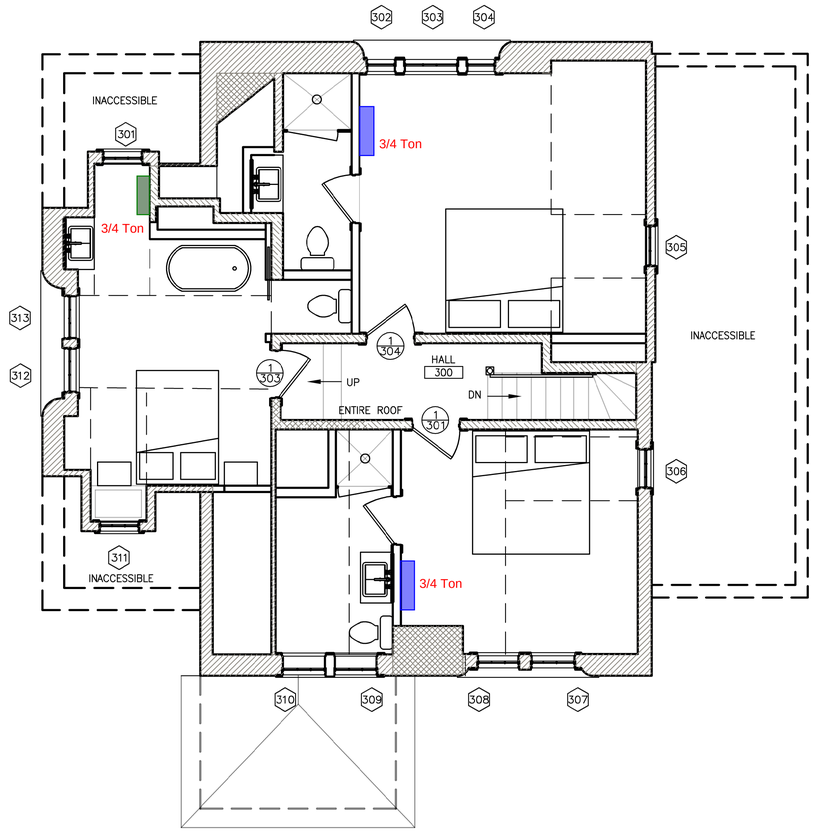
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SUB SHEET NO. T / M3

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 22 OF 48



1 / M4 THIRD FLOOR PLAN
1/4" = 1'-0"

PROJECT NORTH

KEY

- SUPPLY AIR DIFFUSER
- RETURN AIR
- DUCT
- FAN COIL UNIT
- WALL MOUNTED UNIT
- FLOOR MOUNTED UNIT

4 0 4 8
SCALE OF FEET

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SUB SHEET NO. T / M4

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-18
MAIN HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 23 OF 48



Image #627. 1958. Photograph of Brick House. (National Park Service, Denver Service Center, Technical Information Center, Photo Collection, Bailly Homestead, 1958.)

6 TREATMENT RECOMMENDATIONS
BRICK HOUSE

Brick House (HS-19) Treatment Recommendations

Treatment plans and elevations for the Brick House can be found following this narrative.



Figure 6.3. View of HS-19 Brick House, North and west elevations. (Sheals 2017)

The Brick House HS-19 was originally constructed ca. 1875 as a companion building to the Main House, sited perpendicular to the back (east) porch. The brick structure was moved to its current location in 1904. The south addition was constructed ca. 1908. The house in its present form dates from the NPS 1976 rehabilitation. The house has not been occupied in at least 46 years and is not habitable, as it has no utilities or services of any type. Currently, it is littered with construction debris and materials stored in the building.

The building is in fair condition overall and appears to be stabilized since the most recent foundation repair project. The house retains a high level of significant character defining features. This structure is integral to telling the story of the Bailly family and homestead, having been in continual use for nearly 100 years as a kitchen, studio, and a small private residence.

As a critical structure within the Bailly Homestead, the Brick House plays an integral part in the overall rehabilitation and development plan for the historic site. Two options were discussed as appropriate treatment alternatives for the house during the Treatment Alternatives Workshop, both of which utilize *Rehabilitation*, as the primary objective. Rehabilitation of the structure will

allow for maintenance, preservation, and upgrades to accommodate twenty-first century conveniences, while preserving its most important significant historic features. The notes and presentation from the Treatment Alternatives Workshop are found in Appendix H.
Treatment Option 1 considers using the first and second floors of the house as an overnight unit. This use would not be a departure from its historic use as a kitchen house and residence, as an accessory building to the Main House.

Treatment Option 2 considers using the first and second floors for multi-use. The first floor would be utilized as an office/reception for visitors to the site and those staying in the Main House. The second floor could be used for the on-site host or caretaker.

Both Options 1 and 2 are discussed further below and presented in the Treatment Recommendations Plans in the Treatment Drawings at the end of this section of the report.

Both options require complete exterior and interior building rehabilitation, including abatement (LBP and ACM); masonry and window restoration; roofing replacement and underlayment abatement (future); new utility service, new mechanical service, restored finishes, and new restroom accommodation. The installation of a fire suppression system within the structure is also recommended.

The basement in both options would serve as a base for the new water and fire suppression systems for the entire homestead. This is further discussed in the Mechanical and Electrical Treatment Recommendations section of this report. Structural modifications and repairs are also required, due to deteriorated and damaged floor structure and sections of masonry.

Option 1 – Overnight Accommodations (single unit):
Option 1 Treatment Recommendation proposes using the first and second floors of the house for overnight accommodations. Essentially, the Brick House would be an accessory unit to the overnight accommodations in the Main House.

Due to the small footprint of the building and the location of the interior staircase, this adaptive reuse works best if the entire house is viewed as a single, large unit. The first floor of the house could be made to be ADA accessible, but would require the wholesale removal of the interior wall to make an accessible bedroom space on the first floor. The attendees of the workshop agreed this was not ideal, and that the tight floor space made this unreasonable. Therefore, this unit would not be ADA accessible.

The Option 1 proposed Treatment Drawings show a schematic layout for the first and second floors:

- First Floor - small kitchenette; small full bathroom; living area; and den with trundle bed
- Second Floor - large bedroom (king bed); small bedroom (two twin beds); full bathroom

This unit would sleep six in beds and could also sleep another single person on the couch. The maximum occupancy for this unit would be seven persons.

This unit with multiple sleeping arrangement options would accommodate a large family. Because this option does not require ADA accessibility, the front porch stoop and hood can be reconstructed, as seen in several of the historic photographs of the building.

Option 2 – Reception/Office and Overnight Accommodations for Host or Caretaker
Option 2 Treatment Recommendation proposes using utilize the first floor for a reception and office for the site host or caretaker. The second floor would be utilized as a private apartment for the host/caretaker. The second floor could potentially be used for overnight guest accommodation, but this is unlikely, as they would be required to enter through the first floor reception area. This would be a management issue.

This option would require that the first floor of the building be made ADA accessible for visitors, requiring the construction of a new accessible boardwalk/porch to accommodate access to the first floor. The multi-use occupancy of the building will also require fire-rating separation from the first floor to the second floor, by constructing a 60-minute rated wall surrounding the stairs and a rated door at the top of the stairs. The first floor ceiling and all penetrations would be required to be fire rated.

The Option 2 proposed Treatment Drawings show a schematic layout for the first and second floors:

- First Floor – Reception area; storage closet; ADA accessible restroom; and an office (Office could be locked-off from the remainder of the first floor).
- Second Floor - Single overnight accommodation unit with the only access from the interior stair. This unit would be intended to be used as a temporary option by an on-site host, caretaker, or staff member. The unit might contain a small kitchenette, a bedroom/living space with a closet, and a full bathroom.

The anticipated scopes of Immediate and Long Term repairs to address these options are listed below.

Architectural and Structural Recommendations

Immediate Treatment Recommendations - *Maintenance and Preservation*

Refer to the Cost Estimate for Immediate Treatment Recommendations in Appendix K.

1) Access into the main level of the structure should be restricted until the joists beneath the entrance can be repaired or replaced. The flooring at the entrance must also be repaired.
2) Conduct a pest inspection. Install treatment accordingly. No active infestations other than spiders were seen in the house during the assessment.
3) Secure all openings into the building to prevent infestation of insects and rodents. The gaps at the front door and surrounding the basement vents are large enough to allow access into the building.
4) Clean out the building to provide a clear view and access for maintenance and inspections.

Short Term Treatment Recommendations - *Maintenance and Preservation*

Refer to the Cost Estimate for Short Term Treatment Recommendations in Appendix K.

1) Conduct a seasonal maintenance inspection of the interior and exterior of the building. Regular inspections will ensure that deficiencies are noted and addressed promptly, alleviating further damage or deterioration.
2) The crack monitor in the basement of the structure should be monitored on a seasonal basis for continued movement documentation.

Long Term Treatment Recommendations - *Rehabilitation*

Refer to the Cost Estimate for Long Term Treatment Recommendations in Appendix K.

General:

- Hazardous Materials Abatement:
  Perform hazardous materials abatement throughout the house, per the 2017 report completed by Terracon. This includes removal of asbestos containing materials and lead based paint materials.

Exterior:

Masonry:

1) Remove any unused accessories or nails from masonry walls. Repoint where removed.
2) Remove existing mud dauber nests. Clean masonry by scrubbing with detergent and warm water.
3) The bulge in brick at the south elevation should have helical ties installed at 16-inches on center, vertically and horizontally. Helical ties are stainless steel mechanical anchors that tie the exterior wythe of brick back to the interior wythes of wall. They are intended to stabilize the portion of bulging wall in place and prevent continued outward movement. Helical ties are typically 5/16-inch in diameter and may be installed in the mortar joint and concealed.

4) Spot repoint entire building to match historic mortar. Utilize a Type 'O' mortar, match historic mortar aggregate. Repoint 100% of sections indicated on the drawings, as requiring full repointing. If a consistent mortar aesthetic is desired, repoint 100% of building.
5) Monitor brick arch above first floor Window 102 for movement. Cracking in bricks above opening indicates movement.
6) Monitor crack adjacent to first floor Window 104 for movement. The crack has previously been filled and appears to be stable.
7) Re-lay bricks and install new mortar surrounding the repairs above Window 103 and below Window 204.
8) Remove existing broken cast stone sill and install replica cast stone sill at basement window 001.

   Exterior Trim:
9) Remove all deteriorated wood trim. Trim at north and west elevations is riddled with woodpecker holes. Replace with in-kind material, matching all dimensions, profiles and installation techniques. Scarf joint new material to old material. Exterior trim replacement must be made with exterior grade Western red cedar, or approved equal. Prime all surfaces prior to installation.

   Sealants:
10) Install sealant, as required, to seal joints between trim and masonry.
11) Maintain vertical expansion joint between main building and addition (east and west elevations). Color to match the existing brick.
12) Re-Grade exterior, as required for positive drainage away from the building.

   Roof:
13) Perform routine maintenance on existing wood shingle roof. Replace broken or missing shingles, as required. Inspect and repair flashings, as required.
14) Coordinate plumbing and exhaust vent locations on the east roof with the architect to ensure the least amount of visibility.
15) When full roofing replacement is required, abate asbestos roofing underlayment and install new roof.
16) Install half-round gutters and downspouts.

   Chimneys:
17) Inspect chimneys for brick and mortar deterioration and condition of mortar caps. Chimneys appear to be losing mortar wash and sections of brick. Repoint brick and replace deteriorated mortar, mortar cap, and mortar wash, as required. Match existing mortar.

   Doors and Windows:
18) Windows: Restore window sashes, surrounds, trim, and hardware to working condition. Consider installation of new wood storm windows to protect the restored windows. Installation of fixed wood storm windows would prevent operation of the interior historic windows, which may or may not be desired. If operation is desired, install pre-finished aluminum operable storm windows.
19) Install new exterior door frame, threshold (slope to drain), and door to match historic photographs. Install new door hardware and fully weather strip door.

20) Install new replica basement window with glass blacked-out on interior. Swing casement window out for easy access. Install dead bolt lock on the window and frame.
    Porch:
21) Install new light in new porch hood with emergency egress.
22) Option 1: Install new wood porch stoop, railings, and replica porch hood. Install steps.
23) Option 2: Install Option 1 stoop to meet ADA requirements, flush with the interior floor. Install 'boardwalk' to bridge grade and new approaching sidewalk for ADA access.
24) Foundation Vents:
    a. Option 1: If foundation vents are kept: the basement foundation vents on the north elevation should have steel lintels installed. Repair/reset bricks and repoint surrounding areas on interior and exterior. Install new frames and louvers.
    b. Option 2: If foundation vents are removed: Remove vent infill, tooth -in replacement brick to match the existing bricks for entire wall thickness. Repoint surrounding area.

Interior:

25) First Floor Framing:
    a. Rooms 101 and 102 currently have a calculated floor live load capacity of 65 psf, provided that all existing joists are in good condition. This is sufficient for residential or office loadings. Room 103 currently has a calculated floor live load capacity of 34 psf, provided that all existing joists are in good condition.
    b. The framing below Room 103 has at least two joists that require sistering or complete replacement. To increase the live load capacity, six additional joists may be installed. Adding a drop beam is not recommended due to the brick bulging on the south wall.
    c. A wood or steel lintel should be installed at Window 001 (west wall basement window access)in order to support the joists in Room 001.
    d. Seven joists near the north end of the house have been insufficiently spliced at the point of bearing under the entrance to the house. Some of the splice pieces are also affected by wood rot. These joists should be re-spliced with longer members. Another option would be to add additional joists of the same size as the existing ones that would span from the west wall to the divider wall. The additional joists would need to be supported at the west wall by a new ledger beam.
    e. Two joists in the northeast corner of the house are deteriorated and require sistering at the point of bearing. New joists may be supported by a new ledger beam on the east wall.
    f. The entrance to the house should have a threshold installed or be sloped to drain away from the house.
26) Second Floor Framing
    The second floor framing is likely the same as the first floor framing and is assumed to be undamaged. The second floor framing in the south addition will require additional joists to increase the live load capacity.

27) Roof Framing
    a. The rafters and joists above the addition on the south side of the house should be attached to the sill plate with Simpson hurricane ties or similar.
    b. The sill plates in both the north portion of the house and the addition should be securely attached to the exterior masonry walls for the purpose of resisting uplift forces from wind.

Roof Framing:

28) The rafters and joists above the addition on the south side of the house should be attached to the sill plate with Simpson hurricane ties or similar.
29) The sill plates in both the main portion of the house and the south addition should be securely attached to the exterior masonry walls for the purpose of resisting up lift forces from wind.

Structural Foundation:

30) The arch over the doorway from Room 003 to 002 appears to have failed and a wood board is precariously positioned beneath the bricks. The loose bricks should be removed and a new arch may be re-formed. If this is not constructible, a steel lintel may be installed.
31) Install moveable steel or aluminum staircase at the basement entry.
32) Insulate floor joists.
33) Install vapor barrier and mud slab throughout the basement. Install floor drain.
34) Spot repoint masonry in basement.
35) Install new utilities to the basement, including electrical, water, sanitary, gas, data, and telephone. All utilities to be routed underground to the building. Fire pump for fire suppression systems and pump for water service to be located in the basement.
36) Install new 150 amp electrical service and panel to be located in the basement. Install new grounding system.
37) Remove all existing electrical conduits, receptacles and accessories throughout the house.
38) Install new lighting and receptacles throughout.
39) Install new security alarm.
40) Install telephone service.
41) Install wireless connectivity throughout the house.
42) Remove all existing mechanical and plumbing piping, equipment, and accessories throughout the house.
43) Install new mechanical system in the house to serve all three levels of the house. One unit to set in the basement. One horizontal unit to be set in the attic. Coordinate locations of all new grilles with architect.
44) Install new dedicated outdoor air unit in the attic.
45) Install new plumbing system in the house. Install new high efficiency gas-fired water heater.
46) Install fire suppression system throughout the brick house. Install generator for fire pump (to be located south of the house).
47) Install new fire alarm system separate from the security alarm.

48) Install fire extinguisher.
49) Install exit signage and emergency lighting.
50) Demolish interiors as required to complete the rehabilitation work.
51) Restore plaster walls throughout the interior.
52) Restore historic staircase. Install new or salvaged door (if one can be found) at closet under stairs.
53) Install new cased opening 2/100.
54) Install new wood flooring in Room 102.
55) Restore wood floors in Room 101.
56) Install new wood floors in Room 100.
57) Remodel and expand second floor Bathroom 201. Install new tile floor, new sink, toilet, new shower, new exhaust fan, and all accessories. Install new access hatch to attic.
58) Demolish existing lath and plaster ceilings and install new gypsum board ceilings (see Options below for fire rating requirements).
59) Option 1 - Overnight Accommodations in Building:
    a. Install new kitchenette in Entry 100.
    b. Install new Bathroom 104, with tile floor, toilet, sink, shower, exhaust fan, and all accessories. Install window treatments for privacy. Insulate walls for privacy.
    c. Install window treatments throughout the house.
    d. Install guard railing at second floor historic staircase.
    e. Conceal vent piping in northeast corner of first floor kitchenette and Bathroom 201.
    f. Install pocket door at Room 202.
60) Option 2 – Office/Reception and Host/Caretaker Accommodations on Second Floor:
    g. Install new closet in Entry 100.
    h. Install new built-in reception counter in Reception 101.
    i. Install new ADA Restroom 103, with toilet, sink, exhaust fan, and all accessories. Install window treatments for privacy. Insulate walls for privacy.
    j. Install window treatments throughout the house.
    k. Install 1-hour fire rating at all surfaces in closet under staircase.
    l. Install 1-hour fire rated gypsum board ceiling. All penetrations required to be fire - caulked.
    m. Install closet in Bedroom 200.
    n. Install kitchenette in Room 202.
    o. Install 1-hour fire-rated wall/door assembly at top of stairs. If sprinklered, only required to be 30 minutes.

Mechanical/Electrical/Plumbing/Fire Protection Recommendations

Installation of all MEP systems shall be in compliance with all requirements in the 2015 International Building Codes, including 2015 International Fire Code, 2015 International Plumbing Code, 2015 International Mechanical Code, 2015 International Fuel Gas Code, and the 2014 National Electrical Code (NEC).

Mechanical Systems

61) A new heating and cooling system shall be installed to serve the brick house. Refer to main house (HS-18) treatment recommendations for design criteria and a detailed description of the recommended system options.

62) Vertical fan coil units or heat pumps could be located in the basement to condition the basement and first floor spaces. The access to the basement will likely need to be modified to allow for the installation of the units and for proper access for future maintenance purposes. Supply and return air to and from the first floor spaces would be provided by decorative grilles in the floor that are ducted to the units in the basement. The locations and appearance of the grilles would be closely coordinated with the Architect and park services to minimize the impact to the historical appearance of the space. Horizontal fan coil units or heat pumps could be located in the attic to condition the second floor spaces. The access to the attic will need to be modified to allow for the installation of the units and for proper access for future maintenance purposes. Supply and return air to and from the second floor spaces would be provided by decorative grilles in the ceiling that are ducted to the units in the attic. Condensing units (if needed) would be located on grade on the east side of the brick house.

63) Programmable thermostats should be installed throughout the brick house to provide temperature control for each space.

64) Adding a dedicated outside air unit in the attic is recommended to provide code required ventilation air for the occupants. This unit would include an enthalpy heat recovery wheel, filters, heating, and cooling. The unit would include the same heating and cooling equipment that is selected for the main system. The unit would be used to supply ventilation air to all rooms in the building and would exhaust air from both restrooms. Energy recovered from the exhaust air stream would be used to pre-treat the fresh air. The design for the outside air intake and exhaust hood will require careful coordination with the Architect and park services to minimize the impact on the building's historic integrity.

Electrical Systems

65) A new electrical service should be provided to serve the brick house. A new 150 amp, 120/240 volt, single phase service entrance rated load center with a NEMA 1 enclosure and a 150 amp main circuit breaker should be surface mounted in the basement (on or near the south wall). This load center will be fed from below grade from the service disconnect located on the south wall of the brick house. A new grounding system should be installed for the building in compliance with NEC Article 250.

66) Discussions with the local Authority Having Jurisdiction (AHJ) will be required to determine if the utility power to the site will be classified as a "reliable" per NEC 695.3 requirements. It is likely that a generator will be required to provide a second source of power for the fire pump. The generator could be located to the south of the brick house and would be fueled by either diesel or natural gas.

67) All existing electrical devices, boxes, and wiring should be removed in their entirety.

68) Power and lighting branch circuit wiring within the building will be fed from the new main load center by copper conductors routed in EMT conduit. MC cable may be utilized for branch circuit wiring as a cost saving alternative. Where branch circuit wiring can't be concealed in walls, surface mounted raceway shall be utilized. New duplex receptacles and light fixtures shall be provided throughout the brick house. AFCI and GFCI protection shall be provided as required to comply with NEC Article 210 requirements. All receptacles in the brick house shall be tamper-resistant per NEC requirements. Wall mounted occupancy sensor switches or ceiling mounted occupancy sensors shall be utilized in each space for automatic shutoff of the lighting to comply with current energy code requirements.

69) Internally illuminated LED exit signs should be provided to direct occupants to the exits. The exit signs shall be equipped with self-diagnostics and integral batteries to provide a minimum of 90 minutes of continuous operation following a loss of power

70) Emergency lighting should be provided to properly light the path of egress during a loss of power. Emergency lighting units shall be equipped with self-diagnostics and integral batteries to provide a minimum of 90 minute of continuous operation following a loss of power.

71) The existing intrusion detection system should be updated as necessary to meet the needs of the facility. Discussion with park services will be required to determine the requirements of the system.

72) Ceiling or wall mounted wireless access points (WAPs) will be provided throughout the brick house. The WAPs will be connected to the new network switch located in the basement of the main house via CAT6 cable routed through below grade PVC conduit.

Plumbing Systems

73) Remove all existing plumbing systems and piping in their entirety.

74) New plumbing fixtures in the brick house are to be located on the first and second floors and consist of two showers, two lavatories, two water closets, and a 2-compartment sink. Routing of all plumbing system piping (water, waste, vent, gas, etc.) will need to be closely coordinated with the Architect to avoid visibility as much as possible.

75) New domestic water service will be added to serve the plumbing fixtures in the brick house. The water service will be fed from the booster pump located in the basement of the brick house. A new high efficiency gas-fired, tank type hot water heater should be added in the basement to provide hot water to the fixtures in the brick house. If hands-free faucets are used, thermostatic mixing valves must be installed to temper hot water supply to 110 degrees F. A new combustion air intake and flue should be provided for

the water heater. New intake and flue piping should be routed to the exterior of the building. It is recommended that a new hot water recirculation system be added to reduce delivery time of hot water to all plumbing fixtures. Solar water heating should be explored to reduce water heater requirements. Solar panels could be located in the open green space at the north end of the site.

76) New sanitary sewer service will be added to serve the plumbing fixtures in the brick house. The 4" sanitary sewer line will route below grade and will connect to the main site sanitary distribution system. Grey water harvesting (reuse of water from sinks and showers to flush water closets) should be explored.

77) New natural gas service will be added to serve the new water heater and mechanical units that are being added. The gas line will be fed from the below grade site distribution system and will be type SDR11 HDPE pipe. The size of the gas line will need to be determined after design of the other systems has progressed.

Fire Protection Systems

78) Using the Historic Property Assessment Matrix in Chapter 7, Appendix A of the National Park Service Reference Manual 58, Structural Fire Management, a fire alarm system is required, and a fire sprinkler system is recommended for the structure.

79) The sprinkler system should be a wet pipe system designed per NFPA and shall be fed from the fire pump located in the basement of the brick house. The pipe should be schedule 40 steel with threaded or grooved fittings. Schedule 10 pipe should not be allowed because of the probability of leaks due to the thin walls. Unheated areas (attic space) should be served by a dry pipe system.

80) Due to the sensitive nature of the historic structure, it will be important to ensure that the piping and sprinkler layout is carefully coordinated and reviewed by the historic Architect and NPS. A fire protection engineer should be retained to provide a fire alarm system design as well as a full sprinkler system design including pipe layout, sizing, and sprinkler layouts. A code study should be done to determine the exact requirements of the fire protection systems based on the building's intended use. This will ensure that the system design is fully prescribed to minimize impact to the historical significance of the building. Routing of pipes, types of heads, etc. throughout the house will need to be closely coordinated with the Architect and park services to minimize impact to the historical finishes and features.

Building Code, Life Safety, and ADA Existing Conditions

The Brick House HS-19 is currently unoccupied.

Former Use – Residence – 'R' Occupancy
Type VB, Un-Sprinklered. The recommendations are to install a fire suppression system in the building.

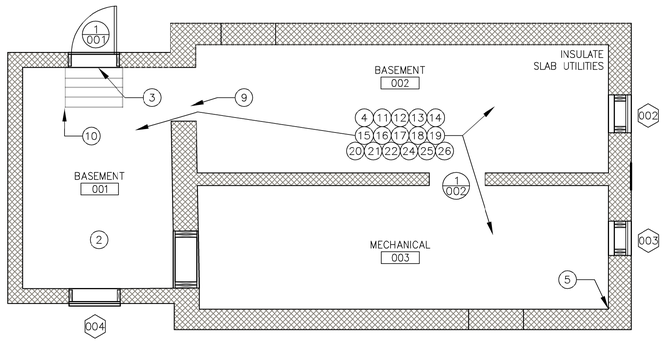
Gross Square Footage

Basement	507 sf
First Floor	507 sf
Second Floor	507 sf
Total	1,521 sf

Occupant load for the building, per IBC – 1,521 sf / 200 sf = 7 persons

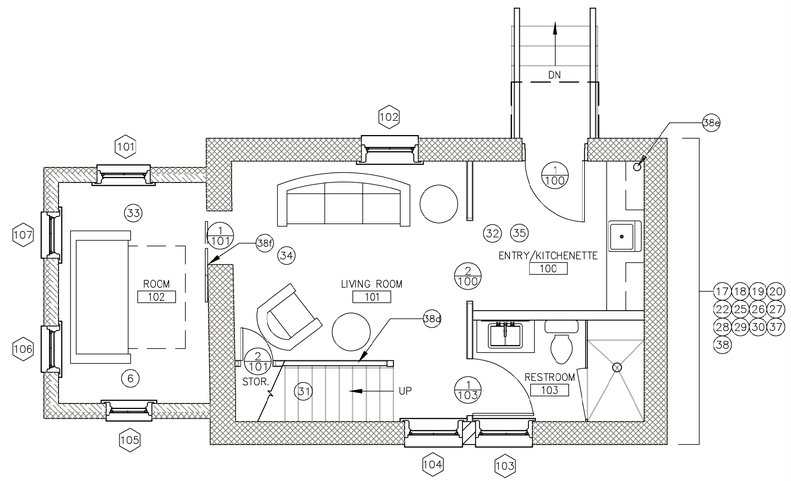
There is currently no smoke or fire alarm, nor are there exit signs or emergency lighting. The recommendations, based on the use of the building are to install a smoke/fire alarm system, as well as exist signage and emergency lighting. Install fire extinguishers at each level.

The building is not ADA accessible. Option 2 includes the modifications necessary to provide ADA accessibility and an ADA compliant restroom on the first floor of the building only. The second floor will not be ADA accessible.



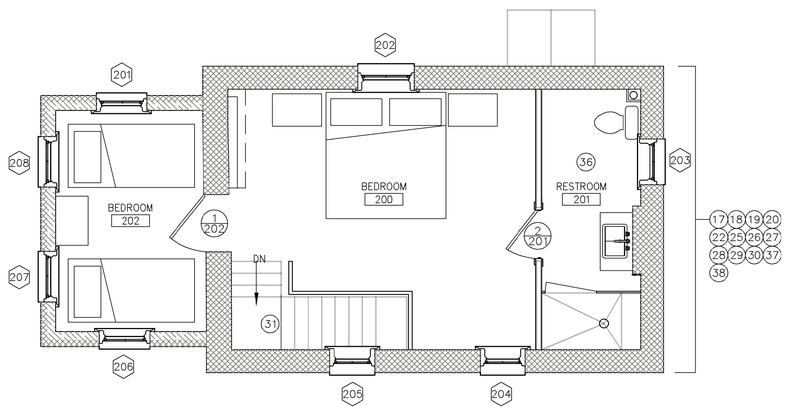
1 A13 BASEMENT PLAN – OPTION 1 – OVERNIGHT ACCOMMODATIONS
1/4" = 1'-0"

PROJECT NORTH



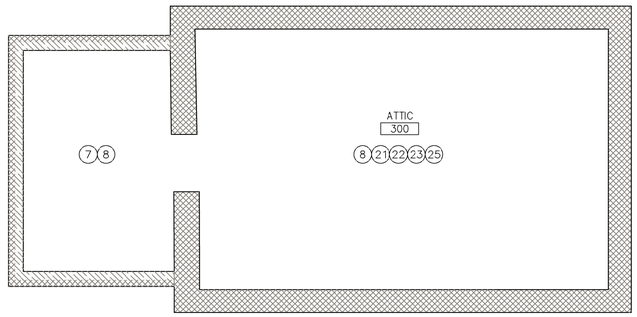
2 A13 FIRST FLOOR PLAN – OPTION 1 – OVERNIGHT ACCOMMODATIONS
1/4" = 1'-0"

PROJECT NORTH



3 A13 SECOND FLOOR PLAN – OPTION 1 – OVERNIGHT ACCOMMODATIONS
1/4" = 1'-0"

PROJECT NORTH



4 A13 ATTIC PLAN – OPTION 1 – OVERNIGHT ACCOMMODATIONS
1/4" = 1'-0"

PROJECT NORTH

4 0 4 8
SCALE OF FEET

IMMEDIATE TREATMENT GENERAL NOTES:

- ACCESS INTO THE MAIN LEVEL OF THE STRUCTURE SHOULD BE RESTRICTED UNTIL THE JOISTS BENEATH THE ENTRANCE CAN BE REPAIRED OR REPLACED. THE FLOORING AT THE ENTRANCE MUST ALSO BE REPAIRED.
- CONDUCT A PEST INSPECTION. INSTALL TREATMENT, ACCORDINGLY. NO ACTIVE INFESTATIONS OTHER THAN SPIDERS WERE SEEN IN THE HOUSE DURING THE ASSESSMENT.
- SECURE ALL OPENINGS INTO THE BUILDING TO PREVENT INFESTATION OF INSECTS AND RODENTS. THE GAPS AT THE FRONT DOOR AND SURROUNDING THE BASEMENT VENTS ARE LARGE ENOUGH TO ALLOW ACCESS INTO THE BUILDING.
- CLEAN OUT THE BUILDING TO PROVIDE A CLEAR VIEW AND ACCESS FOR MAINTENANCE AND INSPECTIONS.

SHORT TERM AND LONG TERM GENERAL NOTES:

- CONDUCT A SEASONAL MAINTENANCE INSPECTION OF THE INTERIOR AND EXTERIOR OF THE BUILDING. REGULAR INSPECTIONS WILL ENSURE THAT DEFICIENCIES ARE CAUGHT AND ADDRESSED PROMPTLY, ALLEVIATING FURTHER DAMAGE OR DETERIORATION.
- THE CRACK MONITOR IN THE BASEMENT OF THE STRUCTURE SHOULD BE MONITORED ON A BI-ANNUAL BASIS FOR CONTINUED MOVEMENT DOCUMENTATION.

LONG TERM MAINTENANCE AND PRESERVATION TREATMENT KEY NOTES INTERIOR:

FIRST FLOOR FRAMING:

1. ROOMS 100 AND 101 CURRENTLY HAVE A CALCULATED FLOOR LIVE LOAD CAPACITY OF 65 PSI, PROVIDED THAT ALL EXISTING JOISTS ARE IN GOOD CONDITION. THIS IS SUFFICIENT FOR RESIDENTIAL OR OFFICE LOADINGS. ROOM 103 CURRENTLY HAS A CALCULATED FLOOR LIVE LOAD CAPACITY OF 34 PSF, PROVIDED THAT ALL EXISTING JOISTS ARE IN GOOD CONDITION.
2. THE FRAMING BELOW ROOM 102 HAS AT LEAST TWO JOISTS THAT REQUIRE SISTERING OR COMPLETE REPLACEMENT DUE TO SIGNIFICANT DETERIORATION. TO INCREASE THE LIVE LOAD CAPACITY, SIX ADDITIONAL JOISTS MAY BE INSTALLED. ADDING A DROP BEAM IS NOT RECOMMENDED DUE TO THE BRICK BULGING ON THE SOUTH WALL.
3. A WOOD OR STEEL LINTEL SHOULD BE INSTALLED AT WINDOW OPENING 001 (WEST WALL BASEMENT WINDOW ACCESS) IN ORDER TO SUPPORT THE JOISTS ABOVE ROOM 001.
4. SEVEN JOISTS NEAR THE NORTH END OF THE HOUSE, ABOVE ROOM 002, HAVE BEEN INSUFFICIENTLY SPLICED AT THE POINT OF BEARING UNDER THE ENTRANCE TO THE HOUSE IN ROOM 100. SOME OF THE SPLICED PIECES ARE ALSO AFFECTED BY WOOD ROT. THESE JOISTS SHOULD BE RE-SPLICED WITH LONGER MEMBERS. ANOTHER OPTION WOULD BE TO ADD ADDITIONAL JOISTS OF THE SAME SIZE AS THE EXISTING ONES THAT WOULD SPAN FROM THE WEST WALL TO THE DIVIDER WALL. THE ADDITIONAL JOISTS WOULD NEED TO BE SUPPORTED AT THE WEST WALL BY A NEW LEDGER BEAM.
5. TWO JOISTS IN THE NORTHEAST CORNER OF THE HOUSE (ABOVE ROOM 003) ARE DETERIORATED AND REQUIRE SISTERING AT THE POINT OF BEARING. NEW JOISTS MAY BE SUPPORTED BY A NEW LEDGER BEAM ON THE EAST WALL.

SECOND FLOOR FRAMING:

6. THE SECOND FLOOR FRAMING IS LIKELY THE SAME AS THE FIRST FLOOR FRAMING AND IS ASSUMED TO BE UNDAMAGED. THE SECOND FLOOR FRAMING IN THE SOUTH ADDITION (ROOM 202) WILL REQUIRE ADDITIONAL JOISTS TO INCREASE THE LIVE LOAD CAPACITY.

ROOF FRAMING:

7. THE RAFTERS AND JOISTS ABOVE THE ADDITION ON THE SOUTH SIDE OF THE HOUSE SHOULD BE ATTACHED TO THE SILL PLATE WITH SIMPSON HURRICANE TIES OR SIMILAR.
8. THE SILL PLATES IN BOTH THE MAIN PORTION OF THE HOUSE AND THE SOUTH ADDITION SHOULD BE SECURELY ATTACHED TO THE EXTERIOR MASONRY WALLS FOR THE PURPOSE OF RESISTING UPLIFT FORCES FROM WIND.

STRUCTURAL FOUNDATION:

9. THE ARCH OVER THE DOORWAY FROM ROOM 003 TO 002 APPEARS TO HAVE FAILED AND A WOOD BOARD IS PRECARIOUSLY POSITIONED BENEATH THE BRICKS. THE LOOSE BRICKS SHOULD BE REMOVED AND A NEW ARCH MAY BE RE-FORMED. IF THIS IS NOT CONSTRUCTIBLE, A STEEL LINTEL MAY BE INSTALLED.
10. INSTALL MOVEABLE STEEL OR ALUMINUM STAIRCASE AT THE BASEMENT ENTRY.
11. INSULATE FLOOR JOISTS.
12. INSTALL VAPOR BARRIER AND MUD SLAB THROUGHOUT THE BASEMENT. INSTALL FLOOR DRAIN.
13. SPOT REPOINT MASONRY IN BASEMENT.
14. INSTALL NEW UTILITIES TO THE BASEMENT, INCLUDING ELECTRICAL, WATER, SANITARY, GAS, DATA, AND TELEPHONE. ALL UTILITIES TO BE ROUTED UNDERGROUND TO THE BUILDING. FIRE PUMP FOR FIRE SUPPRESSION SYSTEMS AND PUMP FOR WATER SERVICE TO BE LOCATED IN THE BASEMENT.
15. INSTALL NEW 150 AMP ELECTRICAL SERVICE AND PANEL TO BE LOCATED IN THE BASEMENT. INSTALL NEW GROUNDING SYSTEM.
16. REMOVE ALL EXISTING ELECTRICAL CONDUIT, RECEPTACLES AND ACCESSORIES, THROUGHOUT THE HOUSE.
17. INSTALL NEW LIGHTING AND RECEPTACLES THROUGHOUT.
18. INSTALL NEW SECURITY ALARM.
19. INSTALL TELEPHONE SERVICE.
20. INSTALL WIRELESS CONNECTIVITY THROUGH THE HOUSE.
21. REMOVE ALL EXISTING MECHANICAL AND PLUMBING PIPING, EQUIPMENT, AND ACCESSORIES THROUGHOUT THE HOUSE.
22. INSTALL NEW MECHANICAL SYSTEM IN THE HOUSE TO SERVE ALL THREE LEVELS OF THE HOUSE. ONE UNIT TO SET IN THE BASEMENT. ONE HORIZONTAL UNIT TO BE SET IN THE ATTIC. COORDINATE LOCATIONS OF ALL NEW GRILLES WITH ARCHITECT.
23. INSTALL NEW DEDICATED OUTDOOR AIR UNIT IN THE ATTIC.
24. INSTALL NEW PLUMBING SYSTEM IN THE HOUSE. INSTALL NEW HIGH EFFICIENCY GAS-FIRED WATER HEATER.
25. INSTALL FIRE SUPPRESSION SYSTEM THROUGHOUT THE BRICK HOUSE. INSTALL GENERATOR FOR FIRE PUMP (TO BE LOCATED SOUTH OF THE HOUSE?).
26. INSTALL NEW FIRE ALARM SYSTEM SEPARATE FROM THE SECURITY ALARM.
27. INSTALL FIRE EXTINGUISHER.
28. INSTALL EXIT SIGNAGE AND EMERGENCY LIGHTING.
29. DEMOLISH INTERIORS, AS REQUIRED TO COMPLETE THE REHABILITATION WORK.
30. RESTORE PLASTER WALLS THROUGHOUT THE INTERIOR.
31. RESTORE HISTORIC STAIRCASE. INSTALL NEW OR SALVAGED DOOR AT CLOSET UNDER STAIRS.
32. INSTALL NEW CASED OPENING 2/100.
33. INSTALL NEW WOOD FLOORING IN ROOM 102.
34. RESTORE WOOD FLOORS IN ROOM 101.
35. INSTALL NEW WOOD FLOORS IN ROOM 100.
36. REMODEL AND EXPAND SECOND FLOOR BATHROOM 201. INSTALL NEW TILE FLOOR, NEW SINK, TOILET, NEW SHOWER, NEW EXHAUST FAN, AND ALL ACCESSORIES. INSTALL NEW ACCESS HATCH TO ATTIC.
37. DEMOLISH EXISTING LATH AND PLASTER CEILINGS AND INSTALL NEW GYPSUM BOARD CEILINGS (SEE OPTIONS BELOW FOR FIRE RATING REQUIREMENTS).
38. OPTION 1 – OVERNIGHT ACCOMMODATIONS IN BUILDING:
    a. INSTALL NEW KITCHENETTE IN ENTRY 100.
    b. INSTALL NEW BATHROOM 104, WITH TILE FLOOR, TOILET, SINK, SHOWER, EXHAUST FAN, AND ALL ACCESSORIES. INSTALL WINDOW TREATMENTS FOR PRIVACY. INSULATE WALLS FOR PRIVACY.
    c. INSTALL WINDOW TREATMENTS THROUGHOUT THE HOUSE.
    d. INSTALL GUARD RAILING AT HISTORIC STAIRCASE.
    e. CONCEAL VENT PIPING IN NORTHEAST CORNER OF FIRST FLOOR KITCHENETTE AND BATHROOM 201.
    f. INSTALL POCKET DOOR AT ROOM 202.
39. OPTION 2 – OFFICE/RECEPTION AND CARETAKER ACCOMMODATIONS ON SECOND FLOOR:
    a. INSTALL NEW CLOSET IN ENTRY 100.
    b. INSTALL NEW BUILT-IN RECEPTION COUNTER IN RECEPTION 101.
    c. INSTALL NEW ADA RESTROOM 103, WITH TOILET, SINK, EXHAUST FAN, AND ALL ACCESSORIES. INSTALL WINDOW TREATMENTS FOR PRIVACY. INSULATE WALLS FOR PRIVACY.
    d. INSTALL WINDOW TREATMENTS THROUGHOUT THE HOUSE.
    e. INSTALL 1-HOUR FIRE RATING AT ALL SURFACES IN CLOSET UNDER STAIRCASE.
    f. INSTALL 1-HOUR FIRE RATED GYPSUM BOARD CEILING. ALL PENETRATIONS REQUIRED TO BE FIRE -CAULKED.
    g. INSTALL CLOSET IN BEDROOM 200.
    h. INSTALL KITCHENETTE IN ROOM 202.
    i. INSTALL 1-HOUR FIRE-RATED WALL/DOOR ASSEMBLY AT TOP OF STAIRS. IF SPRINKLERED, ONLY REQUIRED TO BE 30 MINUTES.

KEY

(#) DRAWING KEY NOTES	BRICK/STONE WALL
000 WINDOW NUMBER	LOG WALL
000/0 DOOR NUMBER	WOOD FRAME WALL
000 ROOM NUMBER	

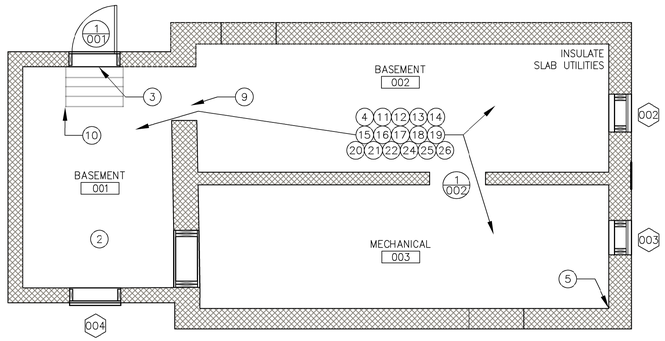
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DESIGNED: CA
DRAWN: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T / A13

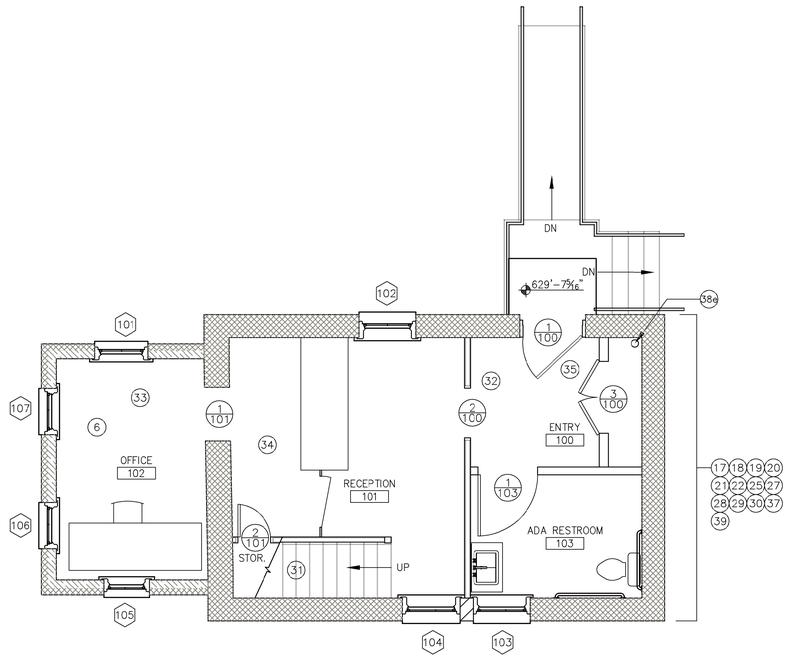
TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-19
BRICK HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 24 OF 48



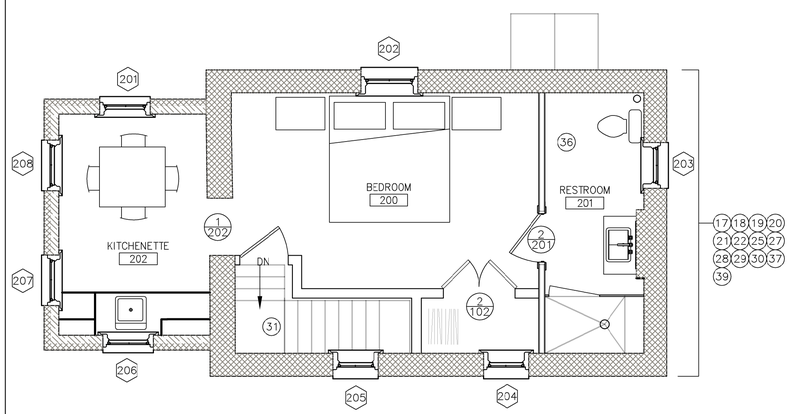
1 A14 BASEMENT FLOOR PLAN – OPTION 2
OFFICE/RECEPTION AND SHORT TERM CARETAKER APT.
1/4" = 1'-0"

PROJECT NORTH



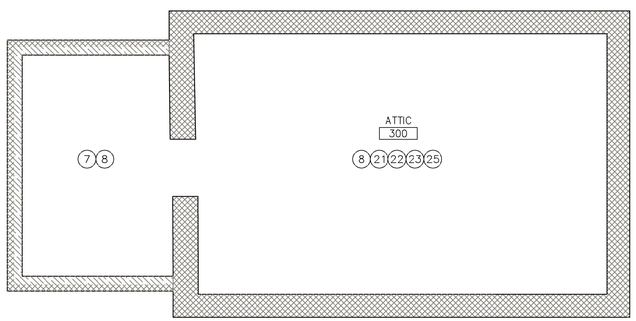
2 A14 FIRST FLOOR PLAN – OPTION 2
OFFICE/RECEPTION AND SHORT TERM CARETAKER APT.
1/4" = 1'-0"

PROJECT NORTH



3 A14 SECOND FLOOR PLAN – OPTION 2
OFFICE/RECEPTION AND SHORT TERM CARETAKER APT.
1/4" = 1'-0"

PROJECT NORTH



4 A14 ATTIC PLAN – OPTION 2
OFFICE/RECEPTION AND SHORT TERM CARETAKER APT.
1/4" = 1'-0"

PROJECT NORTH

4 0 4 8
SCALE OF FEET

IMMEDIATE TREATMENT GENERAL NOTES:

- ACCESS INTO THE MAIN LEVEL OF THE STRUCTURE SHOULD BE RESTRICTED UNTIL THE JOISTS BENEATH THE ENTRANCE CAN BE REPAIRED OR REPLACED. THE FLOORING AT THE ENTRANCE MUST ALSO BE REPAIRED.
- CONDUCT A PEST INSPECTION. INSTALL TREATMENT, ACCORDINGLY. NO ACTIVE INFESTATIONS OTHER THAN SPIDERS WERE SEEN IN THE HOUSE DURING THE ASSESSMENT.
- SECURE ALL OPENINGS INTO THE BUILDING TO PREVENT INFESTATION OF INSECTS AND RODENTS. THE GAPS AT THE FRONT DOOR AND SURROUNDING THE BASEMENT VENTS ARE LARGE ENOUGH TO ALLOW ACCESS INTO THE BUILDING.
- CLEAN OUT THE BUILDING TO PROVIDE A CLEAR VIEW AND ACCESS FOR MAINTENANCE AND INSPECTIONS.

SHORT TERM AND LONG TERM GENERAL NOTES:

- CONDUCT A SEASONAL MAINTENANCE INSPECTION OF THE INTERIOR AND EXTERIOR OF THE BUILDING. REGULAR INSPECTIONS WILL ENSURE THAT DEFICIENCIES ARE CAUGHT AND ADDRESSED PROMPTLY, ALLEVIATING FURTHER DAMAGE OR DETERIORATION.
- THE CRACK MONITOR IN THE BASEMENT OF THE STRUCTURE SHOULD BE MONITORED ON A BI-ANNUAL BASIS FOR CONTINUED MOVEMENT DOCUMENTATION.

LONG TERM MAINTENANCE AND PRESERVATION TREATMENT KEY NOTES INTERIOR:

FIRST FLOOR FRAMING:

1. ROOMS 100 AND 101 CURRENTLY HAVE A CALCULATED FLOOR LIVE LOAD CAPACITY OF 65 PSI, PROVIDED THAT ALL EXISTING JOISTS ARE IN GOOD CONDITION. THIS IS SUFFICIENT FOR RESIDENTIAL OR OFFICE LOADINGS. ROOM 103 CURRENTLY HAS A CALCULATED FLOOR LIVE LOAD CAPACITY OF 34 PSF, PROVIDED THAT ALL EXISTING JOISTS ARE IN GOOD CONDITION.
2. THE FRAMING BELOW ROOM 102 HAS AT LEAST TWO JOISTS THAT REQUIRE SISTERING OR COMPLETE REPLACEMENT DUE TO SIGNIFICANT DETERIORATION. TO INCREASE THE LIVE LOAD CAPACITY, SIX ADDITIONAL JOISTS MAY BE INSTALLED. ADDING A DROP BEAM IS NOT RECOMMENDED DUE TO THE BRICK BULGING ON THE SOUTH WALL.
3. A WOOD OR STEEL LINTEL SHOULD BE INSTALLED AT WINDOW OPENING 001 (WEST WALL BASEMENT WINDOW ACCESS) IN ORDER TO SUPPORT THE JOISTS ABOVE ROOM 001.
4. SEVEN JOISTS NEAR THE NORTH END OF THE HOUSE, ABOVE ROOM 002, HAVE BEEN INSUFFICIENTLY SPLICED AT THE POINT OF BEARING UNDER THE ENTRANCE TO THE HOUSE IN ROOM 100. SOME OF THE SPLICED PIECES ARE ALSO AFFECTED BY WOOD ROT. THESE JOISTS SHOULD BE RE-SPLICED WITH LONGER MEMBERS. ANOTHER OPTION WOULD BE TO ADD ADDITIONAL JOISTS OF THE SAME SIZE AS THE EXISTING ONES THAT WOULD SPAN FROM THE WEST WALL TO THE DIVIDER WALL. THE ADDITIONAL JOISTS WOULD NEED TO BE SUPPORTED AT THE WEST WALL BY A NEW LEDGER BEAM.
5. TWO JOISTS IN THE NORTHEAST CORNER OF THE HOUSE (ABOVE ROOM 003) ARE DETERIORATED AND REQUIRE SISTERING AT THE POINT OF BEARING. NEW JOISTS MAY BE SUPPORTED BY A NEW LEDGER BEAM ON THE EAST WALL.

SECOND FLOOR FRAMING:

6. THE SECOND FLOOR FRAMING IS LIKELY THE SAME AS THE FIRST FLOOR FRAMING AND IS ASSUMED TO BE UNDAMAGED. THE SECOND FLOOR FRAMING IN THE SOUTH ADDITION (ROOM 202) WILL REQUIRE ADDITIONAL JOISTS TO INCREASE THE LIVE LOAD CAPACITY.

ROOF FRAMING:

7. THE RAFTERS AND JOISTS ABOVE THE ADDITION ON THE SOUTH SIDE OF THE HOUSE SHOULD BE ATTACHED TO THE SILL PLATE WITH SIMPSON HURRICANE TIES OR SIMILAR.
8. THE SILL PLATES IN BOTH THE MAIN PORTION OF THE HOUSE AND THE SOUTH ADDITION SHOULD BE SECURELY ATTACHED TO THE EXTERIOR MASONRY WALLS FOR THE PURPOSE OF RESISTING UPLIFT FORCES FROM WIND.

STRUCTURAL FOUNDATION:

9. THE ARCH OVER THE DOORWAY FROM ROOM 003 TO 002 APPEARS TO HAVE FAILED AND A WOOD BOARD IS PRECARIOUSLY POSITIONED BENEATH THE BRICKS. THE LOOSE BRICKS SHOULD BE REMOVED AND A NEW ARCH MAY BE RE-FORMED. IF THIS IS NOT CONSTRUCTIBLE, A STEEL LINTEL MAY BE INSTALLED.
10. INSTALL MOVEABLE STEEL OR ALUMINUM STAIRCASE AT THE BASEMENT ENTRY.
11. INSULATE FLOOR JOISTS.
12. INSTALL VAPOR BARRIER AND MUD SLAB THROUGHOUT THE BASEMENT. INSTALL FLOOR DRAIN.
13. SPOT REPOINT MASONRY IN BASEMENT.
14. INSTALL NEW UTILITIES TO THE BASEMENT, INCLUDING ELECTRICAL, WATER, SANITARY, GAS, DATA, AND TELEPHONE. ALL UTILITIES TO BE ROUTED UNDERGROUND TO THE BUILDING. FIRE PUMP FOR FIRE SUPPRESSION SYSTEMS AND PUMP FOR WATER SERVICE TO BE LOCATED IN THE BASEMENT.
15. INSTALL NEW 150 AMP ELECTRICAL SERVICE AND PANEL TO BE LOCATED IN THE BASEMENT. INSTALL NEW GROUNDING SYSTEM.
16. REMOVE ALL EXISTING ELECTRICAL CONDUIT, RECEPTACLES AND ACCESSORIES, THROUGHOUT THE HOUSE.
17. INSTALL NEW LIGHTING AND RECEPTACLES THROUGHOUT.
18. INSTALL NEW SECURITY ALARM.
19. INSTALL TELEPHONE SERVICE.
20. INSTALL WIRELESS CONNECTIVITY THROUGH THE HOUSE.
21. REMOVE ALL EXISTING MECHANICAL AND PLUMBING PIPING, EQUIPMENT, AND ACCESSORIES THROUGHOUT THE HOUSE.
22. INSTALL NEW MECHANICAL SYSTEM IN THE HOUSE TO SERVE ALL THREE LEVELS OF THE HOUSE. ONE UNIT TO SET IN THE BASEMENT. ONE HORIZONTAL UNIT TO BE SET IN THE ATTIC. COORDINATE LOCATIONS OF ALL NEW GRILLES WITH ARCHITECT.
23. INSTALL NEW DEDICATED OUTDOOR AIR UNIT IN THE ATTIC.
24. INSTALL NEW PLUMBING SYSTEM IN THE HOUSE. INSTALL NEW HIGH EFFICIENCY GAS-FIRED WATER HEATER.
25. INSTALL FIRE SUPPRESSION SYSTEM THROUGHOUT THE BRICK HOUSE. INSTALL GENERATOR FOR FIRE PUMP (TO BE LOCATED SOUTH OF THE HOUSE?).
26. INSTALL NEW FIRE ALARM SYSTEM SEPARATE FROM THE SECURITY ALARM.
27. INSTALL FIRE EXTINGUISHER.
28. INSTALL EXIT SIGNAGE AND EMERGENCY LIGHTING.
29. DEMOLISH INTERIORS, AS REQUIRED TO COMPLETE THE REHABILITATION WORK.
30. RESTORE PLASTER WALLS THROUGHOUT THE INTERIOR.
31. RESTORE HISTORIC STAIRCASE. INSTALL NEW OR SALVAGED DOOR AT CLOSET UNDER STAIRS.
32. INSTALL NEW CASED OPENING 2/100.
33. INSTALL NEW WOOD FLOORING IN ROOM 102.
34. RESTORE WOOD FLOORS IN ROOM 101.
35. INSTALL NEW WOOD FLOORS IN ROOM 100.
36. REMODEL AND EXPAND SECOND FLOOR BATHROOM 201. INSTALL NEW TILE FLOOR, NEW SINK, TOILET, NEW SHOWER, NEW EXHAUST FAN, AND ALL ACCESSORIES. INSTALL NEW ACCESS HATCH TO ATTIC.
37. DEMOLISH EXISTING LATH AND PLASTER CEILINGS AND INSTALL NEW GYPSUM BOARD CEILINGS (SEE OPTIONS BELOW FOR FIRE RATING REQUIREMENTS).
38. OPTION 1 – OVERNIGHT ACCOMMODATIONS IN BUILDING:
    a. INSTALL NEW KITCHENETTE IN ENTRY 100.
    b. INSTALL NEW BATHROOM 104, WITH TILE FLOOR, TOILET, SINK, SHOWER, EXHAUST FAN, AND ALL ACCESSORIES. INSTALL WINDOW TREATMENTS FOR PRIVACY. INSULATE WALLS FOR PRIVACY.
    c. INSTALL WINDOW TREATMENTS THROUGHOUT THE HOUSE.
    d. INSTALL GUARD RAILING AT HISTORIC STAIRCASE.
    e. CONCEAL VENT PIPING IN NORTHEAST CORNER OF FIRST FLOOR KITCHENETTE AND BATHROOM 201.
    f. INSTALL POCKET DOOR AT ROOM 202.
39. OPTION 2 – OFFICE/RECEPTION AND CARETAKER ACCOMMODATIONS ON SECOND FLOOR:
    a. INSTALL NEW CLOSET IN ENTRY 100.
    b. INSTALL NEW BUILT-IN RECEPTION COUNTER IN RECEPTION 101.
    c. INSTALL NEW ADA RESTROOM 103, WITH TOILET, SINK, EXHAUST FAN, AND ALL ACCESSORIES. INSTALL WINDOW TREATMENTS FOR PRIVACY. INSULATE WALLS FOR PRIVACY.
    d. INSTALL WINDOW TREATMENTS THROUGHOUT THE HOUSE.
    e. INSTALL 1-HOUR FIRE RATING AT ALL SURFACES IN CLOSET UNDER STAIRCASE.
    f. INSTALL 1-HOUR FIRE RATED GYPSUM BOARD CEILING. ALL PENETRATIONS REQUIRED TO BE FIRE -CAULKED.
    g. INSTALL CLOSET IN BEDROOM 200.
    h. INSTALL KITCHENETTE IN ROOM 202.
    i. INSTALL 1-HOUR FIRE-RATED WALL/DOOR ASSEMBLY AT TOP OF STAIRS. IF SPRINKLERED, ONLY REQUIRED TO BE 30 MINUTES.

KEY			
(#)	DRAWING KEY NOTES		BRICK/STONE WALL
000	WINDOW NUMBER		LOG WALL
000 0	DOOR NUMBER		WOOD FRAME WALL
000	ROOM NUMBER		

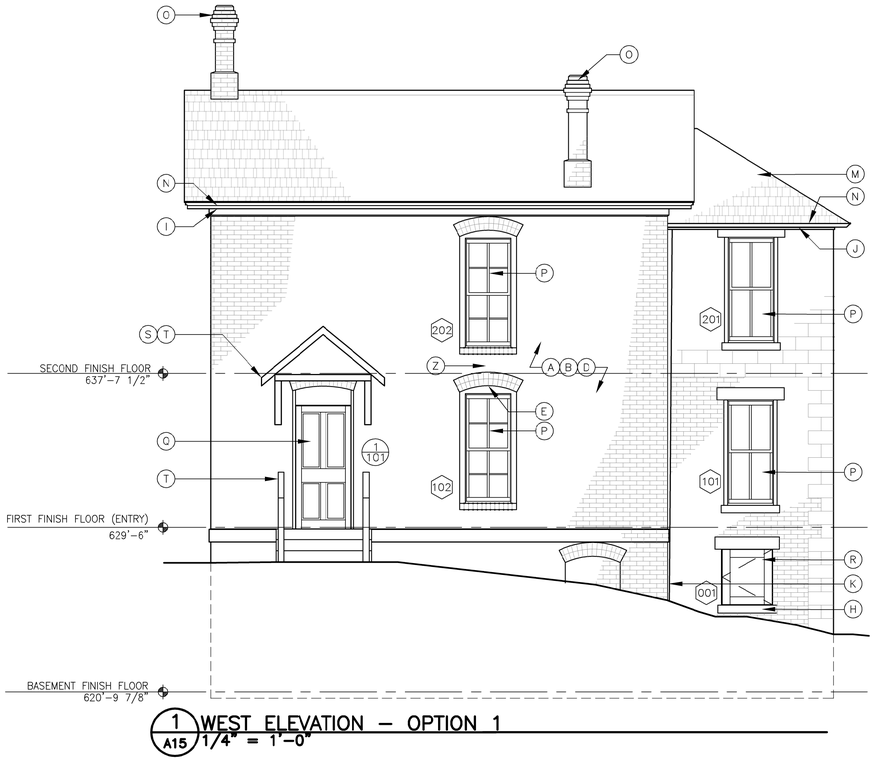
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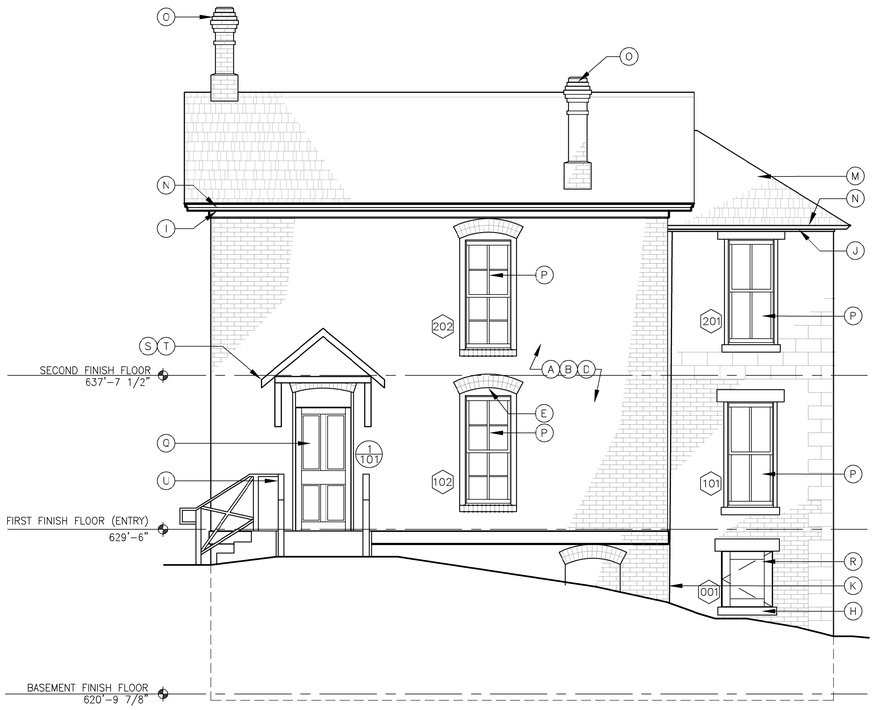
SUB SHEET NO. T / A14

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-19
BRICK HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 25 OF 48



1 / A15 WEST ELEVATION – OPTION 1
1/4" = 1'-0"



2 / A15 WEST ELEVATION – OPTION 2
1/4" = 1'-0"

IMMEDIATE TREATMENT GENERAL NOTES:

- ACCESS INTO THE MAIN LEVEL OF THE STRUCTURE SHOULD BE RESTRICTED UNTIL THE JOISTS BENEATH THE ENTRANCE CAN BE REPAIRED OR REPLACED. THE FLOORING AT THE ENTRANCE MUST ALSO BE REPAIRED.
- CONDUCT A PEST INSPECTION. INSTALL TREATMENT, ACCORDINGLY. NO ACTIVE INFESTATIONS OTHER THAN SPIDERS WERE SEEN IN THE HOUSE DURING THE ASSESSMENT.
- SECURE ALL OPENINGS INTO THE BUILDING TO PREVENT INFESTATION OF INSECTS AND RODENTS. THE GAPS AT THE FRONT DOOR AND SURROUNDING THE BASEMENT VENTS ARE LARGE ENOUGH TO ALLOW ACCESS INTO THE BUILDING.
- CLEAN OUT THE BUILDING TO PROVIDE A CLEAR VIEW AND ACCESS FOR MAINTENANCE AND INSPECTIONS.

SHORT TERM AND LONG TERM GENERAL NOTES:

- CONDUCT A SEASONAL MAINTENANCE INSPECTION OF THE INTERIOR AND EXTERIOR OF THE BUILDING. REGULAR INSPECTIONS WILL ENSURE THAT DEFICIENCIES ARE CAUGHT AND ADDRESSED PROMPTLY, ALLEVIATING FURTHER DAMAGE OR DETERIORATION.
- THE CRACK MONITOR IN THE BASEMENT OF THE STRUCTURE SHOULD BE MONITORED ON A BI-ANNUAL BASIS FOR CONTINUED MOVEMENT DOCUMENTATION.

LONG TERM MAINTENANCE AND PRESERVATION TREATMENT KEY NOTES EXTERIOR:

MASONRY:

A. REMOVE ANY UNUSED ACCESSORIES OR NAILS FROM MASONRY WALLS. REPOINT WHERE REMOVED.

B. REMOVE EXISTING MUD DAUBER NESTS. CLEAN MASONRY BY SCRUBBING WITH DETERGENT AND WARM WATER.

C. THE BULGE IN BRICK AT THE SOUTH ELEVATION SHOULD HAVE HELICAL TIES INSTALLED AT 16-INCHES ON CENTER, VERTICALLY, AND HORIZONTALLY.

D. SPOT REPOINT ENTIRE BUILDING TO MATCH HISTORIC MORTAR. UTILIZE A TYPE 'O' MORTAR, MATCH HISTORIC MORTAR AGGREGATE. REPOINT 100% OF SECTIONS INDICATED ON THE DRAWINGS AS REQUIRING FULL REPOINTING. IF A CONSISTENT MORTAR AESTHETIC IS DESIRED, REPOINT 100% OF BUILDING.

E. MONITOR BRICK ARCH ABOVE FIRST FLOOR WINDOW 102 FOR MOVEMENT. CRACKING IN BRICKS ABOVE OPENING INDICATE MOVEMENT.

F. MONITOR CRACK ADJACENT TO FIRST FLOOR WINDOW 104 FOR MOVEMENT. THE CRACK HAS PREVIOUSLY BEEN FILLED AND APPEARS TO BE STABLE.

G. RE-LAY BRICKS AND INSTALL NEW MORTAR SURROUNDING THE REPAIRS, ABOVE WINDOW 103 AND BELOW WINDOW 204.

H. REMOVE EXISTING BROKEN CAST STONE SILL AND INSTALL REPLICA CAST STONE SILL.

EXTERIOR TRIM:

I. REMOVE ALL DETERIORATED WOOD TRIM. TRIM AT NORTH AND WEST ELEVATIONS IS RIDDLED WITH WOODPECKER HOLES. REPLACE WITH IN-KIND MATERIAL, MATCHING ALL DIMENSIONS, PROFILES AND INSTALLATION TECHNIQUES. SCARF JOINT NEW MATERIAL TO OLD MATERIAL. EXTERIOR TRIM REPLACEMENT MUST BE MADE WITH EXTERIOR GRADE WESTERN RED CEDAR, OR APPROVED EQUAL. PRIME ALL SURFACES PRIOR TO INSTALLATION.

SEALANTS:

J. INSTALL SEALANT, AS REQUIRED, TO SEAL JOINTS BETWEEN TRIM AND MASONRY.

K. MAINTAIN VERTICAL EXPANSION JOINT BETWEEN MAIN BUILDING AND ADDITION (EAST AND WEST ELEVATIONS). COLOR TO MATCH THE EXISTING BRICK.

L. RE-GRADE EXTERIOR, AS REQUIRED.

ROOF:

M. PERFORM ROUTINE MAINTENANCE ON EXISTING WOOD SHINGLE ROOF. REPLACE BROKEN OR MISSING SHINGLES, AS REQUIRED. INSPECT AND REPAIR FLASHINGS, AS REQUIRED.

N. INSTALL HALF-ROUND GUTTERS AND DOWNSPOUTS.

CHIMNEYS:

O. INSPECT CHIMNEYS FOR BRICK AND MORTAR DETERIORATION AND CONDITION OF MORTAR CAPS. CHIMNEYS APPEAR TO BE LOSING MORTAR WASH AND SECTIONS OF BRICK. REPOINT BRICK AND REPLACE DETERIORATED MORTAR, MORTAR CAP, AND MORTAR WASH, AS REQUIRED. MATCH EXISTING MORTAR.

WINDOWS:

P. RESTORE WINDOW SASHES, SURROUNDS, TRIM, AND HARDWARE TO WORKING CONDITION. CONSIDER INSTALLATION OF NEW WOOD STORM WINDOWS TO PROTECT THE RESTORED WINDOWS. INSTALLATION OF FIXED WOOD STORM WINDOWS WOULD PREVENT OPERATION OF THE INTERIOR HISTORIC WINDOWS, WHICH MAY OR MAY NOT BE DESIRED. IF OPERATION IS DESIRED, INSTALL PRE-FINISHED ALUMINUM OPERABLE STORM WINDOWS.

DOORS:

Q. INSTALL NEW EXTERIOR DOOR FRAME, THRESHOLD (SLOPE TO DRAIN), AND DOOR TO MATCH HISTORIC PHOTOGRAPHS. INSTALL NEW DOOR HARDWARE AND FULLY WEATHER STRIP DOOR.

R. INSTALL NEW REPLICA BASEMENT WINDOW WITH GLASS BLACKED-OUT ON INTERIOR. SWING CASEMENT WINDOW OUT FOR EASY ACCESS. INSTALL DEAD BOLT LOCK ON THE WINDOW AND FRAME.

PORCH:

S. INSTALL NEW PORCH HOOD AND LIGHT WITH EMERGENCY EGRESS.

T. OPTION 1: INSTALL NEW WOOD PORCH STOOP, RAILINGS, AND REPLICA PORCH HOOD. INSTALL STEPS.

U. OPTION 2: INSTALL OPTION 1 STOOP TO MEET ADA REQUIREMENTS, FLUSH WITH THE INTERIOR FLOOR. INSTALL 'BOARDWALK' TO BRIDGE GRADE AND NEW APPROACHING SIDEWALK FOR ADA ACCESS.

FOUNDATION VENTS:

V. OPTION 1: IF FOUNDATION VENTS ARE KEPT: THE BASEMENT FOUNDATION VENTS ON THE NORTH ELEVATION SHOULD HAVE STEEL LINTELS INSTALLED. REPAIR/RESET BRICKS AND REPOINT SURROUNDING AREAS ON INTERIOR AND EXTERIOR. INSTALL NEW FRAMES LOUVERS.

W. OPTION 2: IF FOUNDATION VENTS ARE REMOVED: REMOVE VENT INFILL, TOOTH -IN REPLACEMENT BRICK TO MATCH THE EXISTING BRICKS FOR ENTIRE WALL THICKNESS. REPOINT SURROUNDING AREA.

X. COORDINATE PLUMBING AND EXHAUST VENT LOCATIONS ON THE EAST ROOF WITH ARCHITECT.

Y. WHEN FULL ROOFING REPLACEMENT IS REQUIRED, ABATE ASBESTOS ROOFING UNDERLAYMENT AND INSTALL NEW ROOF.

Z. REPOINT OPEN JOINTS AND CRACKS IN BRICK MASONRY.

AA. REPLACE CRACKED BRICK.

KEY	
#	DRAWING KEY NOTES
000	WINDOW NUMBER
000 / 0	DOOR NUMBER
000	ROOM NUMBER

4 0 4 8
SCALE OF FEET

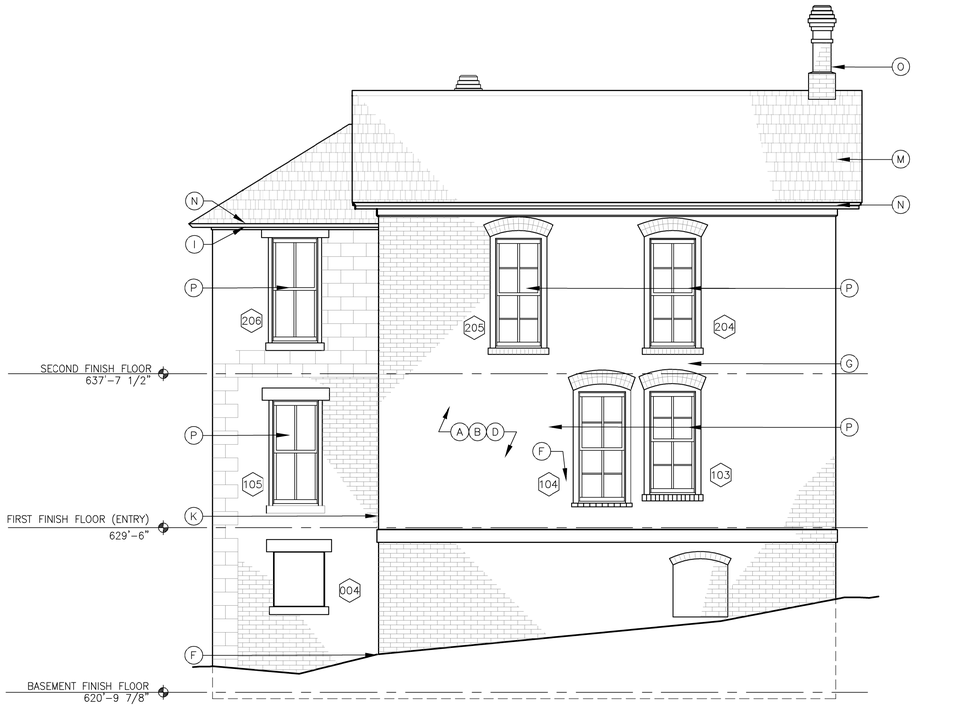
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DESIGNED: CA
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SUB SHEET NO. T / A15

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-19
BRICK HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 26 OF 48



1 / A16 EAST ELEVATION
1/4" = 1'-0"

IMMEDIATE TREATMENT GENERAL NOTES:

- ACCESS INTO THE MAIN LEVEL OF THE STRUCTURE SHOULD BE RESTRICTED UNTIL THE JOISTS BENEATH THE ENTRANCE CAN BE REPAIRED OR REPLACED. THE FLOORING AT THE ENTRANCE MUST ALSO BE REPAIRED.
- CONDUCT A PEST INSPECTION. INSTALL TREATMENT, ACCORDINGLY. NO ACTIVE INFESTATIONS OTHER THAN SPIDERS WERE SEEN IN THE HOUSE DURING THE ASSESSMENT.
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MASONRY:

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C. THE BULGE IN BRICK AT THE SOUTH ELEVATION SHOULD HAVE HELICAL TIES INSTALLED AT 16-INCHES ON CENTER, VERTICALLY, AND HORIZONTALLY.

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F. MONITOR CRACK ADJACENT TO FIRST FLOOR WINDOW 104 FOR MOVEMENT. THE CRACK HAS PREVIOUSLY BEEN FILLED AND APPEARS TO BE STABLE.

G. RE-LAY BRICKS AND INSTALL NEW MORTAR SURROUNDING THE REPAIRS, ABOVE WINDOW 103 AND BELOW WINDOW 204.

H. REMOVE EXISTING BROKEN CAST STONE SILL AND INSTALL REPLICA CAST STONE SILL.

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SEALANTS:

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L. RE-GRADE EXTERIOR, AS REQUIRED.

ROOF:

M. PERFORM ROUTINE MAINTENANCE ON EXISTING WOOD SHINGLE ROOF. REPLACE BROKEN OR MISSING SHINGLES, AS REQUIRED. INSPECT AND REPAIR FLASHINGS, AS REQUIRED.

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DOORS:

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R. INSTALL NEW REPLICA BASEMENT WINDOW WITH GLASS BLACKED-OUT ON INTERIOR. SWING CASEMENT WINDOW OUT FOR EASY ACCESS. INSTALL DEAD BOLT LOCK ON THE WINDOW AND FRAME.

PORCH:

S. INSTALL NEW PORCH HOOD AND LIGHT WITH EMERGENCY EGRESS.

T. OPTION 1: INSTALL NEW WOOD PORCH STOOP, RAILINGS, AND REPLICA PORCH HOOD. INSTALL STEPS.

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KEY

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000	WINDOW NUMBER
000/0	DOOR NUMBER
000	ROOM NUMBER

4 0 4 8
SCALE OF FEET

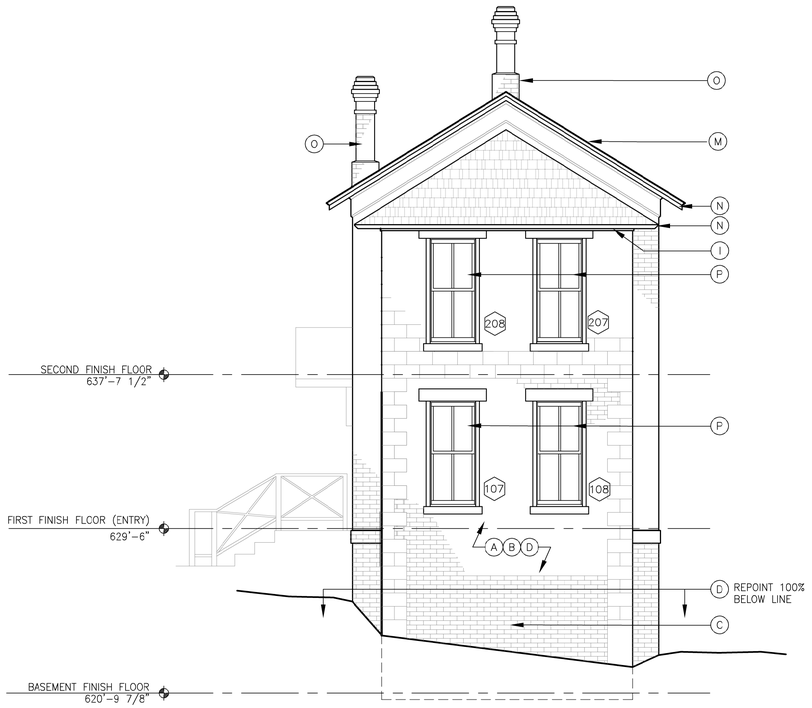
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DESIGNED: CA
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SUB SHEET NO. T / A16

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-19
BRICK HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
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DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 27 OF 48



1 / A17 SOUTH ELEVATION
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U. OPTION 2: INSTALL OPTION 1 STOOP TO MEET ADA REQUIREMENTS, FLUSH WITH THE INTERIOR FLOOR. INSTALL 'BOARDWALK' TO BRIDGE GRADE AND NEW APPROACHING SIDEWALK FOR ADA ACCESS.

FOUNDATION VENTS:

V. OPTION 1: IF FOUNDATION VENTS ARE KEPT: THE BASEMENT FOUNDATION VENTS ON THE NORTH ELEVATION SHOULD HAVE STEEL LINTELS INSTALLED. REPAIR/RESET BRICKS AND REPOINT SURROUNDING AREAS ON INTERIOR AND EXTERIOR. INSTALL NEW FRAMES LOUVERS.

W. OPTION 2: IF FOUNDATION VENTS ARE REMOVED: REMOVE VENT INFILL, TOOTH -IN REPLACEMENT BRICK TO MATCH THE EXISTING BRICKS FOR ENTIRE WALL THICKNESS. REPOINT SURROUNDING AREA.

X. COORDINATE PLUMBING AND EXHAUST VENT LOCATIONS ON THE EAST ROOF WITH ARCHITECT.

Y. WHEN FULL ROOFING REPLACEMENT IS REQUIRED, ABATE ASBESTOS ROOFING UNDERLAYMENT AND INSTALL NEW ROOF.

Z. REPOINT OPEN JOINTS AND CRACKS IN BRICK MASONRY.

AA. REPLACE CRACKED BRICK.

KEY

(#)	DRAWING KEY NOTES
000	WINDOW NUMBER
000/0	DOOR NUMBER
000	ROOM NUMBER

4 0 4 8
SCALE OF FEET

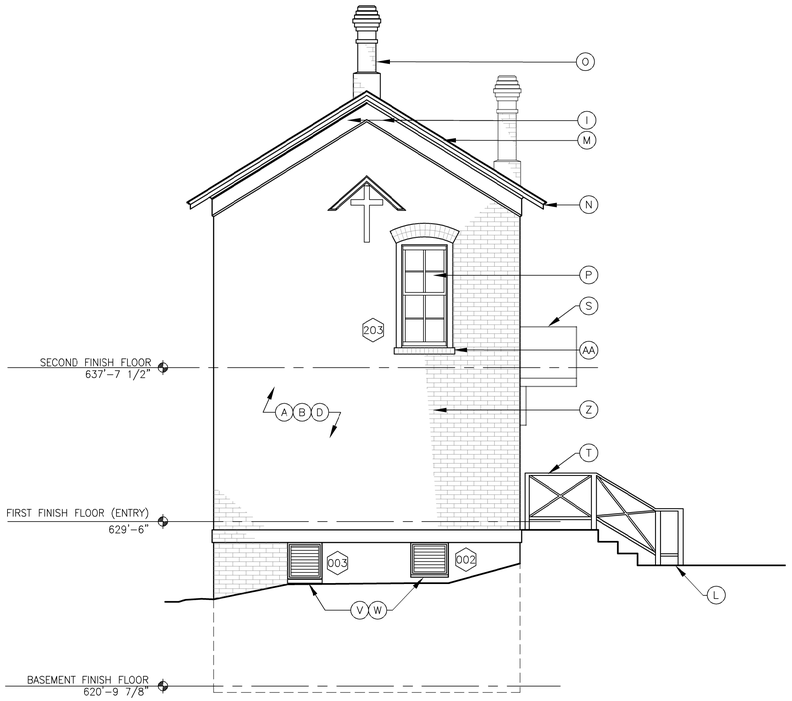
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DESIGNED: CA
DRAWN: CA
TECH. REVIEW: AG
DATE: 05/07/18

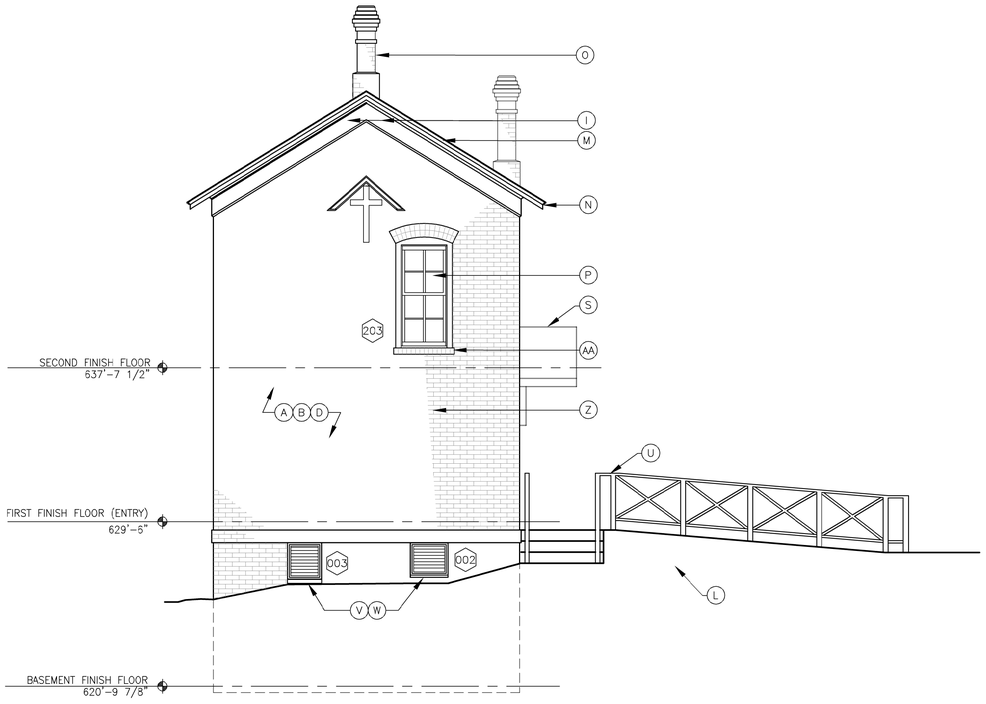
SUB SHEET NO. T / A17

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-19
BRICK HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 28 OF 48



1 A18 NORTH ELEVATION – OPTION 1
1/4" = 1'-0"



2 A18 NORTH ELEVATION – OPTION 2
1/4" = 1'-0"

IMMEDIATE TREATMENT GENERAL NOTES:

- ACCESS INTO THE MAIN LEVEL OF THE STRUCTURE SHOULD BE RESTRICTED UNTIL THE JOISTS BENEATH THE ENTRANCE CAN BE REPAIRED OR REPLACED. THE FLOORING AT THE ENTRANCE MUST ALSO BE REPAIRED.
- CONDUCT A PEST INSPECTION. INSTALL TREATMENT, ACCORDINGLY. NO ACTIVE INFESTATIONS OTHER THAN SPIDERS WERE SEEN IN THE HOUSE DURING THE ASSESSMENT.
- SECURE ALL OPENINGS INTO THE BUILDING TO PREVENT INFESTATION OF INSECTS AND RODENTS. THE GAPS AT THE FRONT DOOR AND SURROUNDING THE BASEMENT VENTS ARE LARGE ENOUGH TO ALLOW ACCESS INTO THE BUILDING.
- CLEAN OUT THE BUILDING TO PROVIDE A CLEAR VIEW AND ACCESS FOR MAINTENANCE AND INSPECTIONS.

SHORT TERM AND LONG TERM GENERAL NOTES:

- CONDUCT A SEASONAL MAINTENANCE INSPECTION OF THE INTERIOR AND EXTERIOR OF THE BUILDING. REGULAR INSPECTIONS WILL ENSURE THAT DEFICIENCIES ARE CAUGHT AND ADDRESSED PROMPTLY, ALLEVIATING FURTHER DAMAGE OR DETERIORATION.
- THE CRACK MONITOR IN THE BASEMENT OF THE STRUCTURE SHOULD BE MONITORED ON A BI-ANNUAL BASIS FOR CONTINUED MOVEMENT DOCUMENTATION.

LONG TERM MAINTENANCE AND PRESERVATION TREATMENT KEY NOTES EXTERIOR:

MASONRY:

A. REMOVE ANY UNUSED ACCESSORIES OR NAILS FROM MASONRY WALLS. REPOINT WHERE REMOVED.

B. REMOVE EXISTING MUD DAUBER NESTS. CLEAN MASONRY BY SCRUBBING WITH DETERGENT AND WARM WATER.

C. THE BULGE IN BRICK AT THE SOUTH ELEVATION SHOULD HAVE HELICAL TIES INSTALLED AT 16-INCHES ON CENTER, VERTICALLY, AND HORIZONTALLY.

D. SPOT REPOINT ENTIRE BUILDING TO MATCH HISTORIC MORTAR. UTILIZE A TYPE 'O' MORTAR, MATCH HISTORIC MORTAR AGGREGATE. REPOINT 100% OF SECTIONS INDICATED ON THE DRAWINGS AS REQUIRING FULL REPOINTING. IF A CONSISTENT MORTAR AESTHETIC IS DESIRED, REPOINT 100% OF BUILDING.

E. MONITOR BRICK ARCH ABOVE FIRST FLOOR WINDOW 102 FOR MOVEMENT. CRACKING IN BRICKS ABOVE OPENING INDICATE MOVEMENT.

F. MONITOR CRACK ADJACENT TO FIRST FLOOR WINDOW 104 FOR MOVEMENT. THE CRACK HAS PREVIOUSLY BEEN FILLED AND APPEARS TO BE STABLE.

G. RE-LAY BRICKS AND INSTALL NEW MORTAR SURROUNDING THE REPAIRS, ABOVE WINDOW 103 AND BELOW WINDOW 204.

H. REMOVE EXISTING BROKEN CAST STONE SILL AND INSTALL REPLICA CAST STONE SILL.

EXTERIOR TRIM:

I. REMOVE ALL DETERIORATED WOOD TRIM. TRIM AT NORTH AND WEST ELEVATIONS IS RIDDLED WITH WOODPECKER HOLES. REPLACE WITH IN-KIND MATERIAL, MATCHING ALL DIMENSIONS, PROFILES AND INSTALLATION TECHNIQUES. SCARF JOINT NEW MATERIAL TO OLD MATERIAL. EXTERIOR TRIM REPLACEMENT MUST BE MADE WITH EXTERIOR GRADE WESTERN RED CEDAR, OR APPROVED EQUAL. PRIME ALL SURFACES PRIOR TO INSTALLATION.

SEALANTS:

J. INSTALL SEALANT, AS REQUIRED, TO SEAL JOINTS BETWEEN TRIM AND MASONRY.

K. MAINTAIN VERTICAL EXPANSION JOINT BETWEEN MAIN BUILDING AND ADDITION (EAST AND WEST ELEVATIONS). COLOR TO MATCH THE EXISTING BRICK.

L. RE-GRADE EXTERIOR, AS REQUIRED.

ROOF:

M. PERFORM ROUTINE MAINTENANCE ON EXISTING WOOD SHINGLE ROOF. REPLACE BROKEN OR MISSING SHINGLES, AS REQUIRED. INSPECT AND REPAIR FLASHINGS, AS REQUIRED.

N. INSTALL HALF-ROUND GUTTERS AND DOWNSPOUTS.

CHIMNEYS:

O. INSPECT CHIMNEYS FOR BRICK AND MORTAR DETERIORATION AND CONDITION OF MORTAR CAPS. CHIMNEYS APPEAR TO BE LOSING MORTAR WASH AND SECTIONS OF BRICK. REPOINT BRICK AND REPLACE DETERIORATED MORTAR, MORTAR CAP, AND MORTAR WASH, AS REQUIRED. MATCH EXISTING MORTAR.

WINDOWS:

P. RESTORE WINDOW SASHES, SURROUNDS, TRIM, AND HARDWARE TO WORKING CONDITION. CONSIDER INSTALLATION OF NEW WOOD STORM WINDOWS TO PROTECT THE RESTORED WINDOWS. INSTALLATION OF FIXED WOOD STORM WINDOWS WOULD PREVENT OPERATION OF THE INTERIOR HISTORIC WINDOWS, WHICH MAY OR MAY NOT BE DESIRED. IF OPERATION IS DESIRED, INSTALL PRE-FINISHED ALUMINUM OPERABLE STORM WINDOWS.

DOORS:

Q. INSTALL NEW EXTERIOR DOOR FRAME, THRESHOLD (SLOPE TO DRAIN), AND DOOR TO MATCH HISTORIC PHOTOGRAPHS. INSTALL NEW DOOR HARDWARE AND FULLY WEATHER STRIP DOOR.

R. INSTALL NEW REPLICA BASEMENT WINDOW WITH GLASS BLACKED-OUT ON INTERIOR. SWING CASEMENT WINDOW OUT FOR EASY ACCESS. INSTALL DEAD BOLT LOCK ON THE WINDOW AND FRAME.

PORCH:

S. INSTALL NEW PORCH HOOD AND LIGHT WITH EMERGENCY EGRESS.

T. OPTION 1: INSTALL NEW WOOD PORCH STOOP, RAILINGS, AND REPLICA PORCH HOOD. INSTALL STEPS.

U. OPTION 2: INSTALL OPTION 1 STOOP TO MEET ADA REQUIREMENTS, FLUSH WITH THE INTERIOR FLOOR. INSTALL 'BOARDWALK' TO BRIDGE GRADE AND NEW APPROACHING SIDEWALK FOR ADA ACCESS.

FOUNDATION VENTS:

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4 0 4 8
SCALE OF FEET

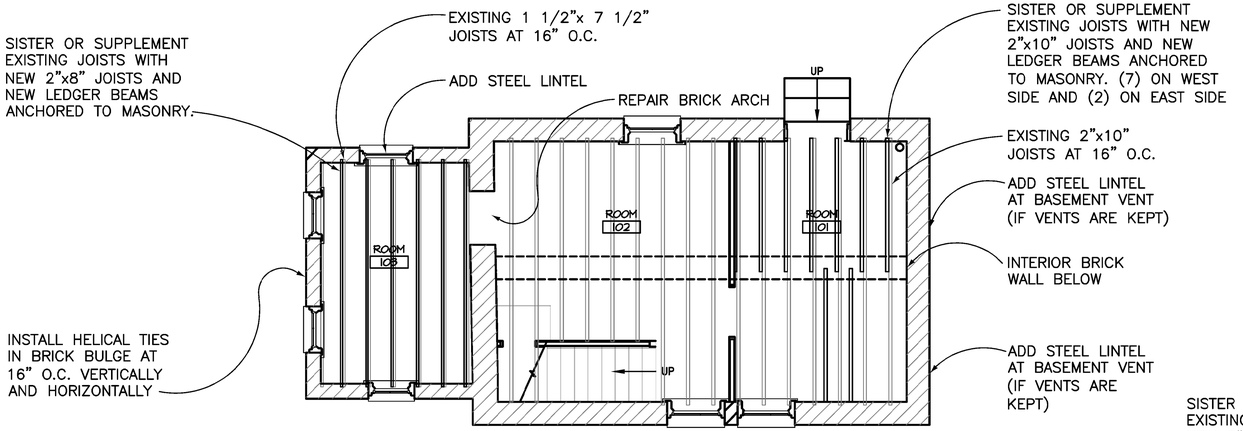
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DESIGNED: CA
DRAWN: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T / A18

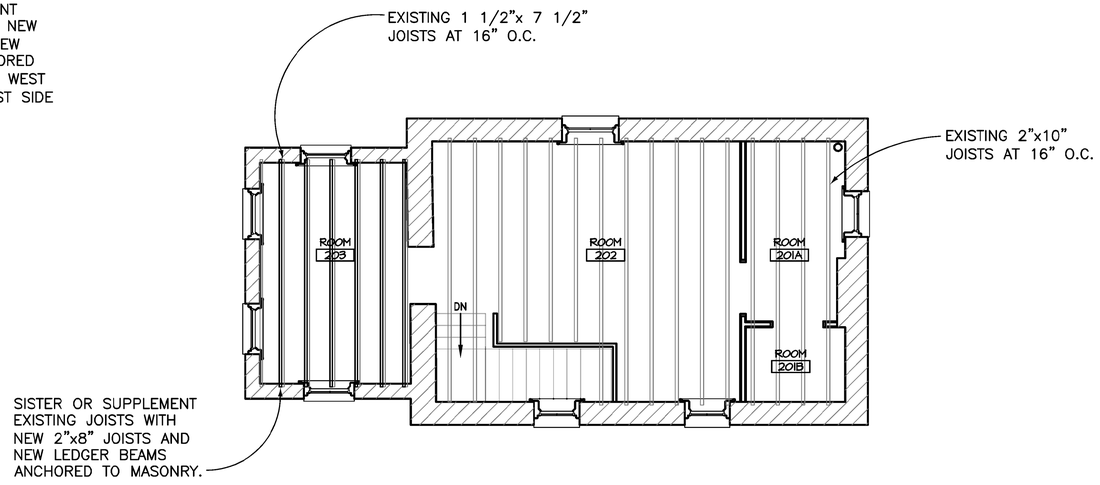
TITLE OF SHEET
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PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 29 OF 48



1 / TS4 FIRST FLOOR FRAMING PLAN
1/4" = 1'-0"

PROJECT NORTH



2 / TS4 SECOND FLOOR FRAMING PLAN
1/4" = 1'-0"

PROJECT NORTH

4 0 4 8
SCALE OF FEET

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TECH. REVIEW:
DATE: 05/07/18

SUB SHEET NO. T S4

TITLE OF SHEET
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PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 30 OF 48



Two-Story Log House, ca. 1916. (INDU Museum Collection)

6 TREATMENT RECOMMENDATIONS
TWO-STORY LOG HOUSE

Two-Story Log House (HS-20) Treatment Recommendations

Treatment drawings for the Two-Story Log House can be found following this narrative.



Figure 6.4. View of HS-20 Two-Story Log House, West elevation. (Sheals 2017)

The Two-Story Log House is currently not habitable due to the condition of the interior and lack of utilities. The building exterior is in fair condition, requiring maintenance typical of a log structure of this age. There are but few original building components remaining in this structure: two rafters, one collar tie, less than 20% of the logs, window sashes, bracketed chimney cabinet, and the interior stair and stair wall components. Bricks from the original structure were supposedly salvaged and reused to reconstruct the brick chimney and foundation.

As part of the overall site treatment discussed during the Treatment Alternatives Workshop, the Two-Story Log House is planned to be rehabilitated to be used as overnight accommodations, in conjunction with the Main House and ancillary structures. This is a compatible use for the historic residence. Due to the limited footprint of the building, this structure will not be made to be ADA accessible. New utilities will be brought to the building to serve the updated function.

The proposed Treatment Recommendation Plans include a small sitting area, a full bathroom, and a small kitchenette on the first floor. The interior log walls would remain exposed, and the wood flooring would be refinished. The bathroom would contain a free-standing tub/shower, a

small sink, and a toilet. The historic closet under the stairs would be accessible from the bathroom. The existing historic stairs would be restored, with new handrails and a guard railing at the second floor. The second floor would contain the sleeping area. The rafters would remain exposed on the second floor level.

All new mechanical and electrical systems would be installed, per the Mechanical section of this report, including a new fire alarm and fire suppression system. A new plumbing vent stack would be installed in the northeast corner of the building and trimmed with stained wood to match the logs. An exhaust vent would be installed in the bathroom, and its ducting closely coordinated with the plumbing chase. Structural modifications are required at the stair wall to support the second story. These modifications are addressed in the Structural section of this report.

Architectural and Structural Recommendations

Immediate Treatment Recommendations - *Maintenance and Preservation*

Refer to the Cost Estimate for Immediate Treatment Recommendations in Appendix K.

1) Conduct a pest inspection as carpenter ants were witnessed during the August 2017 site visit. Install treatment accordingly.
2) Access to the second level of the structure should be restricted, and it should not be used for storage.
3) Clean out the building to provide a clear view and access for maintenance and inspections.

Short Term Treatment Recommendations - *Maintenance and Preservation*

Refer to the Cost Estimate for Short Term Treatment Recommendations in Appendix K.

1) Conduct a seasonal maintenance inspection of the interior and exterior of the building. Regular inspections will ensure that deficiencies are caught and addressed promptly, alleviating further damage or deterioration. The logs currently do not exhibit any significant deterioration requiring replacement. However, the log below the east window should be examined more closely. If required, scarf in a new log in this location.
2) Recommend light media blasting the exterior surface of the logs prior to treatment to remove deteriorated wood. Utilize corn cobs or similar soft media. Test before final treatment.
3) Treat logs with another round of Tim-bor and a top coating of wood protectant. A high-performance wood protectant may include: Armstrong's Wood Stain (Natural); TWP 1500 Series (Natural); or Messmer's UV Plus.[355]
4) Fill checks larger than ¼" with appropriately-sized backer rod and appropriate filler material

[355] Magill, Courtney. "Performance Assessment and Evaluation of Hydrophobic and Ultraviolet Protective Treatments for Historic Log Structure." University of Pennsylvania, 2015, 152.

5) Daubing:
    a. Option 1: Maintain Portland cement daubing. Replace deteriorated daubing material, in kind. Fill cracks.
    b. Option 2: Remove Portland cement daubing and chinking in its entirety and install new replica chinking and natural daubing mixture.
    c. Option 3: Remove Portland cement daubing and chinking in its entirety and install new synthetic daubing material.
6) Repair second floor door deterioration, as required. Install wood preservative and UV protectant at door and trim.
7) Restore window sashes and hardware. Consider installation of exterior wood storm windows to protect the restored windows. Installation of a fixed storm window would prevent operation of the windows, which may or may not be desired. A storm window cannot be installed on the west egress window at the second floor.
8) Perform maintenance on roof. Replace damaged, deteriorated, or missing shingles.
9) Repair deteriorated or damaged exterior trim with exterior grade wood. Match all dimensions and profiles. Deteriorated or broken trim areas include multiple areas around the dormer and the east Window 100 drip cap and trim. Treat all replacement wood with preservative and UV protectant.
10) Clean and treat all exterior trim with wood preservative and UV protectant.
11) Spot repoint brick masonry foundation.
12) Inspect foundation vent screening and replace, as required.
13) Inspect chimney cap and repair, as required.
14) Replace broken threshold at the front door. Replace door stops. Paint front door and frame.
15) Remove mud dauber nests.
16) Re-grade soil to a minimum of four inches below foundation vents.
17) Remove unused Sentricon system.

Long Term Treatment Recommendations - *Rehabilitation*

Refer to the Cost Estimate for Long Term Treatment Recommendations in Appendix K.

Exterior:

1) Consider installation of gutters and downspouts.
2) If the log structure is reconstructed, or if the bottom sill logs are replaced, install copper termite shield between the top of the masonry foundation and the logs.
3) Install guard railing outside the second floor door opening.
4) Install new exterior light appropriate for the historic building on the exterior with emergency battery backup.
5) Roofing replacement in the next 5-7 years, remove existing wood roofing. Abate existing asbestos roofing underlayment. Install new wood shingle roof. Replace flashings, as required.

Interior:

1) Abate lead based paint and asbestos, if tested and found positive. Quantity and extent unknown at this time.
2) Install new electrical service to the building and 100-amp panel. Install grounding.
3) Install new wiring throughout the building. Provide new receptacles and switches.
4) Install new wireless connectivity into the building.
5) Install new lighting throughout the interior of the building.
6) Install new security and smoke alarm.
7) Refinish wood flooring.
8) Install wood treatment to all interior trim to remain.
9) Install new mechanical ventilation system for heating and air conditioning.
10) Install new front door hardware (lock and latch). Install weatherstripping.
11) Carefully remove and salvage interior flooring for access into crawl space. Inspect crawl space. Prepare for new utility installation. Ensure a minimum of 8 inches clear from the soil to the underside of the joists. Install a vapor barrier throughout the crawl space. Lap joints and up sides of walls.
12) Inspect first floor framing, repair, as required. This was not able to be inspected during the assessment, as the crawl space is inaccessible.
13) Reinstall salvaged flooring in its original locations.
14) The interior wall at the stairs is inadequate for supporting the hewn timbers above. The wall should be completely removed and replaced with a wood stud wall with studs at 16-inches on center. The existing framing and stairs will require temporary shoring during this operation. The existing beaded finish board on the wall should be salvaged and reinstalled on the face of the new wall. Support below the wall should continue to the foundations. If there is no foundation directly below this wall, add new posts and footings.
15) Install new bathroom and all related fixtures and accessories. Route plumbing venting in northeast corner. Conceal at first and second floors.
16) Install new kitchenette, including a small sink and under-counter refrigerator and cabinetry.
17) Paint existing interior stair.
18) Paint interior of windows.
19) Install new guard railing at second floor stair opening and new stair handrail.
20) Paint existing bracketed chimney cabinet and steel angles.
21) Provide a second floor egress ladder adjacent to window.
22) Install fire extinguisher
23) Install fan coil unit and related condensing unit.
24) Install exhaust fan in bathroom.
25) Install sanitary sewer line.
26) Install new gas service.
27) Install new water service and water heater.
28) Remove daubing where the roof rafters are framed into the roof plate for assessment of the connections. The rafters must be securely fastened to the roof plate.

Mechanical/Electrical/Plumbing/Fire Protection Recommendations

Installation of all MEP systems shall be in compliance with all requirements in the 2015 International Building Codes, including 2015 International Fire Code, 2015 International Plumbing Code, 2015 International Mechanical Code, 2015 International Fuel Gas Code, and the 2014 National Electrical Code (NEC).

Immediate Treatment Recommendations

Electrical Systems

1) There is no existing electrical service to the Two-story log cabin.
2) The existing exterior GFCI receptacle should be replaced with a new weather-resistant rated device per NEC requirements. The below grade branch circuit serving the receptacle should be traced to its origination point.
3) The functionality of the existing intrusion detection system should be verified.

Long-Term Treatment Recommendations

Mechanical Systems

4) A new heating and cooling system shall be installed to serve the Two-story log cabin. Refer to main house (HS-18) treatment recommendations for design criteria and a detailed description of the recommended system options.
5) A wall mounted, low-profile, ductless fan coil unit or heat pump should be mounted in the first floor Lounge and the second floor Bedroom. The locations and finishes of the wall mounted units would be closely coordinated with the Architect and park services to minimize the impact to the historical appearance of the space. A condensing unit (if needed) would be located on grade on the east side of the cabin.
6) A programmable thermostat should be installed on each floor of the cabin. One in the Lounge Area and one in the Bedroom to provide temperature control for each space.
7) Outside air requirements will be minimal for this building and will be handled by natural ventilation. If this is deemed as an unacceptable method by the local AHJ or park services, a duct could be connected from a louver on an exterior sidewall of the cabin to the return air plenum of the fan coil unit. A damper and additional controls would be required for the system to operate properly.
8) A ceiling mounted exhaust fan should be installed in the bathroom. The exhaust fan should be ducted to the exterior of the building, either through the roof or through the exterior wall.

Electrical Systems

9) A new electrical service should be provided to serve the 2-story log cabin. A new 100 Amp, 120/240 volt, single phase service entrance rated load center with a NEMA 3R enclosure and a 60 amp main circuit breaker should be surface mounted to the exterior of the east wall. This load center will be fed from below grade from the service disconnect located on the south wall of the brick house. A new grounding system should be installed for the building in compliance with NEC Article 250.

10) The existing exterior receptacle mounted to the east wall of the cabin should be disconnected from its current service point and reconnected to the new load center.
11) Power and lighting branch circuit wiring within the building will be fed from the new main load center by copper conductors routed in EMT conduit. MC cable may be utilized for branch circuit wiring as a cost saving alternative. Where branch circuit wiring can't be concealed in walls, surface mounted raceway shall be utilized. New duplex receptacles and light fixtures shall be provided inside the cabin. AFCI and GFCI protection shall be provided as required to comply with NEC Article 210 requirements. All receptacles in the cabin shall be tamper-resistant per NEC requirements. Wall mounted occupancy sensor switches shall be utilized in each space for automatic shutoff of the lighting to comply with current energy code requirements.
12) The existing intrusion detection system should be updated as necessary to meet the needs of the facility. Discussion with park services will be required to determine the requirements of the system.

13) A ceiling or wall mounted wireless access point (WAP) will be provided in the cabin. The WAP will be connected to the new network switch located in the basement of the main house via CAT6 cable routed through a below grade PVC conduit.

Plumbing Systems

14) New plumbing fixtures in the 2-story log cabin are all to be located on the first floor and consist of a tub/shower, a lavatory, a water closet, and a sink. Routing of all plumbing system piping (water, waste, vent, gas, etc.) will need to be closely coordinated with the Architect to avoid visibility as much as possible.
15) New domestic water service will be added to serve the plumbing fixtures in the cabin. The water service will be fed from the booster pump located in the basement of the brick house through a 1-inch below grade Type K Copper Pipe. A new high efficiency gas or electric, tank type hot water heater should be added to provide hot water to the fixtures in the cabin. If hands-free faucets are used, thermostatic mixing valves must be installed to temper hot water supply to 110 degrees F. A new combustion air intake and flue should be provided for the water heater. New intake and flue piping should be routed to the exterior of the building.
16) New sanitary sewer service will be added to serve the plumbing fixtures in the cabin. The sanitary service will route below grade and will connect to the main site sanitary distribution system.
17) New natural gas service will be added to serve the new water heater and mechanical units that are being added. The gas line will be fed from the below grade site distribution system and will be type SDR11 HDPE pipe. The size of the gas line will need to be determined after design of the other systems has progressed.

Fire Protection Systems

18) Using the Historic Property Assessment Matrix in Chapter 7, Appendix A of the National Park Service Reference Manual 58, Structural Fire Management, a fire alarm system is required, and a fire sprinkler system is recommended for the structure.

19) A new fire alarm system should be installed in the Two-story log cabin to comply with code and NPS requirements.
20) A new fire sprinkler system should be installed in the Two-story log cabin to comply with National Park requirements. The new system should be a wet pipe system designed per NFPA and shall be fed from the fire pump located in the basement of the brick house. Piping shall be routed below grade from the basement of the brick house to the basement of the Two-story log cabin. The pipe should be schedule 40 steel with threaded or grooved fittings. Schedule 10 pipe should not be allowed because of the probability of leaks due to the thin walls.
21) Due to the sensitive nature of the historic structure, it will be important to ensure that the piping and sprinkler layout is carefully coordinated and reviewed by the historic Architect and the National Park Service. A fire protection engineer should be retained to provide a fire alarm system design as well as a full sprinkler system design including pipe layout, sizing, and sprinkler layouts. This will ensure that the system design is fully prescribed to minimize impact to the historical significance of the building.

Building Code, Life Safety, and ADA Existing Conditions

The Two-Story Log House HS-20 is currently unoccupied.

Former Use – Residence – 'R' Occupancy
Type VB Construction, non-sprinklered

Square Footage

First Floor	137 sf
Second Floor	138 sf
Total	275 sf

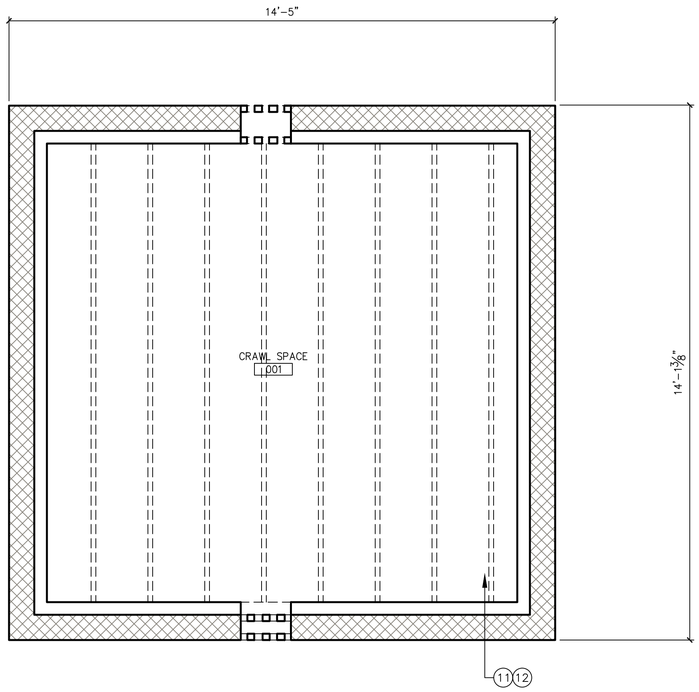
Occupant load for the building, per IBC – 275 sf / 200 sf = 1 persons
(This will require a variance from the Authority Having Jurisdiction to accommodate 2 persons.)

Install smoke and fire alarm. Install two exit signs and emergency lighting.

Install a fire extinguisher.

Install a fire ladder from the second floor. Fix egress window on west elevation to be operable.

This building is not able to accommodate ADA accessibility due to its small floor plate and two-story configuration.



1 / A19 CRAWL SPACE PLAN
1/2" = 1'-0"

PROJECT NORTH

KEY	
# DRAWING KEY NOTES	BRICK/STONE WALL
000 WINDOW NUMBER	LOG WALL
000 / 0 DOOR NUMBER	WOOD FRAME WALL
000 ROOM NUMBER	

IMMEDIATE TREATMENT – GENERAL NOTES:

- CONDUCT A PEST INSPECTION. CARPENTER ANTS WERE WITNESSED DURING AUGUST 2017 SITE VISIT. INSTALL TREATMENT ACCORDINGLY.
- CLEAN OUT BUILDING TO PROVIDE CLEAR VIEW AND ACCESS FOR MAINTENANCE AND INSPECTIONS.

SHORT TERM AND LONG TERM – GENERAL NOTES:

- CONDUCT SEASONAL MAINTENANCE INSPECTION OF THE INTERIOR AND EXTERIOR OF THE BUILDING.
- ALL REPLACEMENT TRIM TO BE TREATED WITH WOOD PRESERVATIVE ON ALL SURFACES AND ALL CUTS, PRIOR TO INSTALLATION.

SHORT TERM MAINTENANCE AND PRESERVATION TREATMENT KEY NOTES:

A. CLEAN ALL EXTERIOR WOOD. INSTALL WOOD PROTECTANT TO ALL EXTERIOR LOGS AND TRIM, INCLUDING DOOR AND WINDOW TRIM.
B. PAINT FRONT DOOR.
C. REPAIR EXISTING SECOND FLOOR DOOR DETERIORATION, AS REQUIRED. INSTALL PROTECTANT AT SECOND FLOOR DOOR.
D. FILL CHECKS IN LOGS LARGER THAN ¼" WITH APPROPRIATELY SIZED BACK ROD AND APPROPRIATE FILLER MATERIAL.
E. DAUBING:
OPTION 1: MAINTAIN PORTLAND CEMENT DAUBING. REPLACE DETERIORATED DAUBING MATERIAL, IN KIND. FILL CRACKS.
OPTION 2: REMOVE PORTLAND CEMENT DAUBING AND CHINKING IN ITS ENTRETY AND INSTALL NEW REPLICA CHINKING AND ORGANIC DAUBING MATERIAL.
OPTION 3: REMOVE PORTLAND CEMENT DAUBING AND CHINKING IN ITS ENTRETY AND INSTALL NEW SYNTHETIC DAUBING MATERIAL
F. RESTORE WINDOW SASHES. RESTORE ALL EXISTING HARDWARE. CONSIDER INSTALLATION OF A NEW WOOD STORM WINDOW TO PROTECT THE RESTORED DOUBLE-HUNG WINDOWS. INSTALLATION OF A FIXED WOOD STORM WINDOW WOULD PREVENT OPERATION OF THE WINDOWS, WHICH MAY OR MAY NOT BE DESIRED.
G. PERFORM MAINTENANCE FOR ROOFING SHINGLES.
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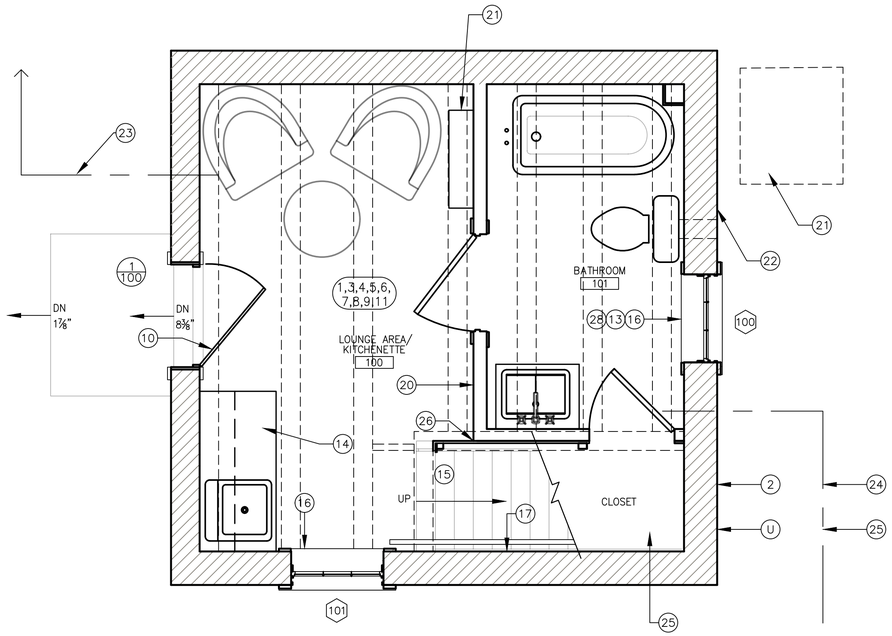
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DESIGNED: CA
DRAWN: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T / A19

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
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PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 31 OF 48



1 / A20 FIRST FLOOR PLAN
1/2" = 1'-0"

PROJECT NORTH

KEY			
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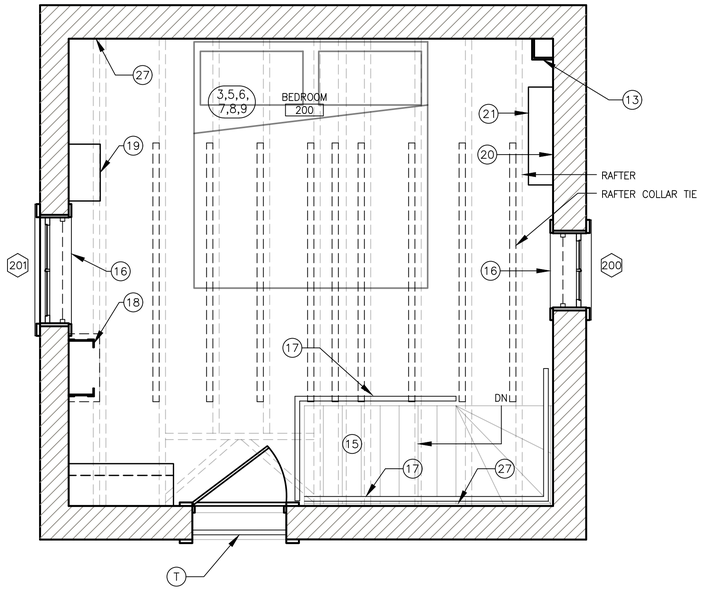
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PROJECT NORTH

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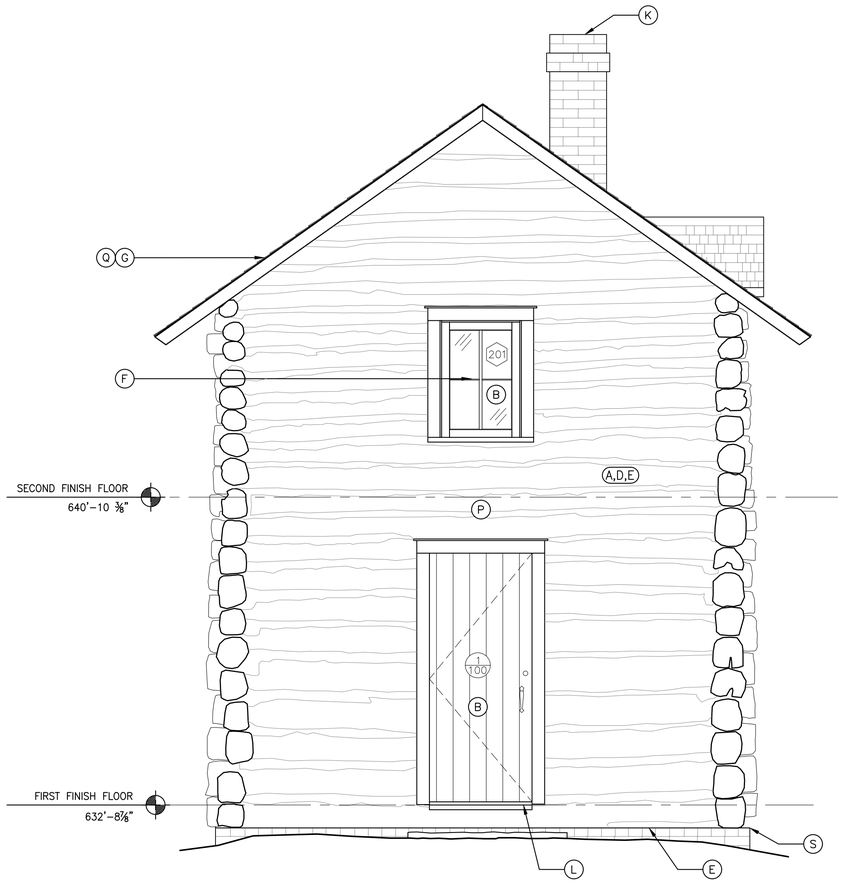
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R. CONSIDER INSTALLATION OF NEW HALF-ROUND GUTTERS AND DOWNSPOUTS.
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T. INSTALL WOOD GUARD RAILING AT THE SECOND FLOOR DOOR.

2 0 2 4
SCALE OF FEET

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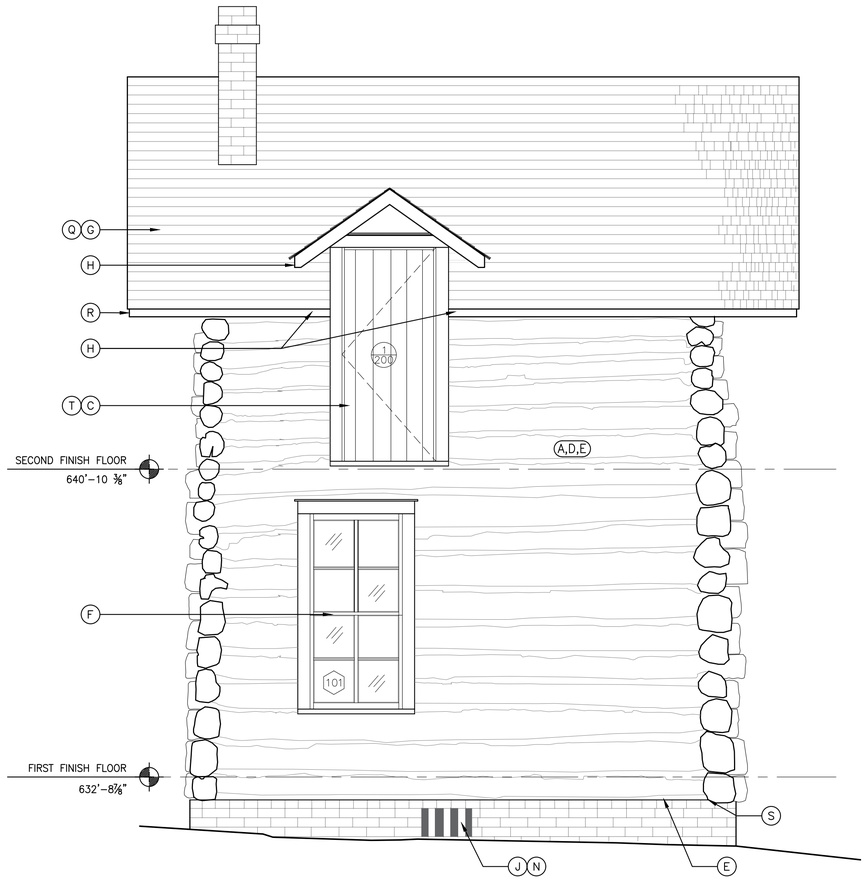
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DESIGNED: CA
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SUB SHEET NO. T / A22

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-20
TWO-STORY LOG HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 34 OF 48



1 / A23 SOUTH ELEVATION
1/2" = 1'-0"

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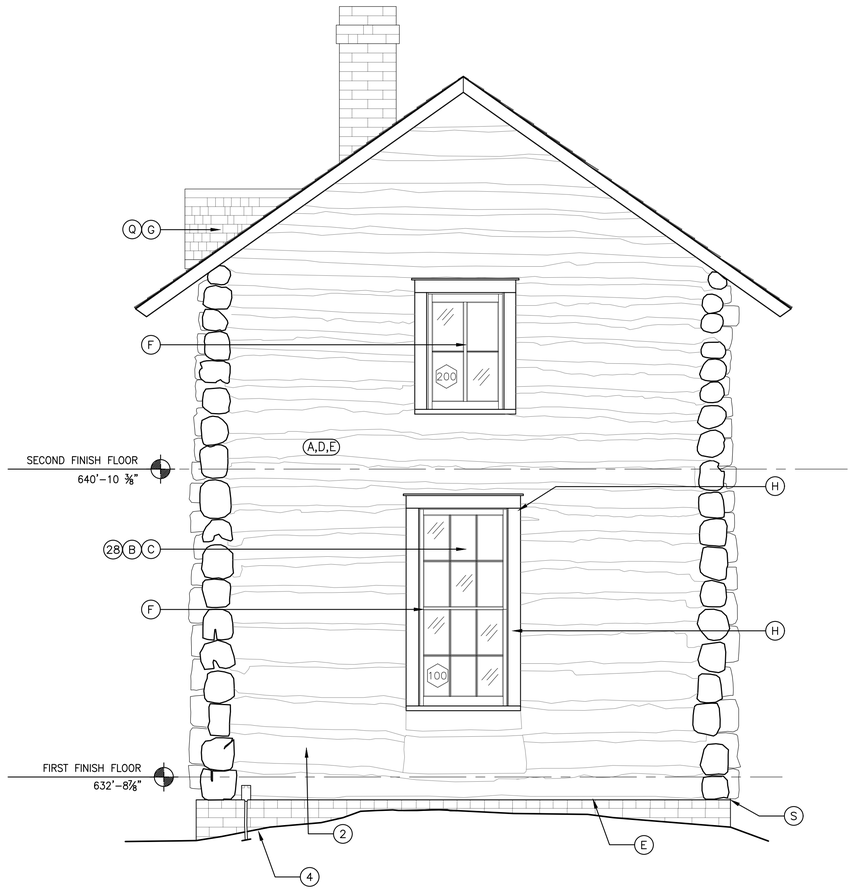
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BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 35 OF 48



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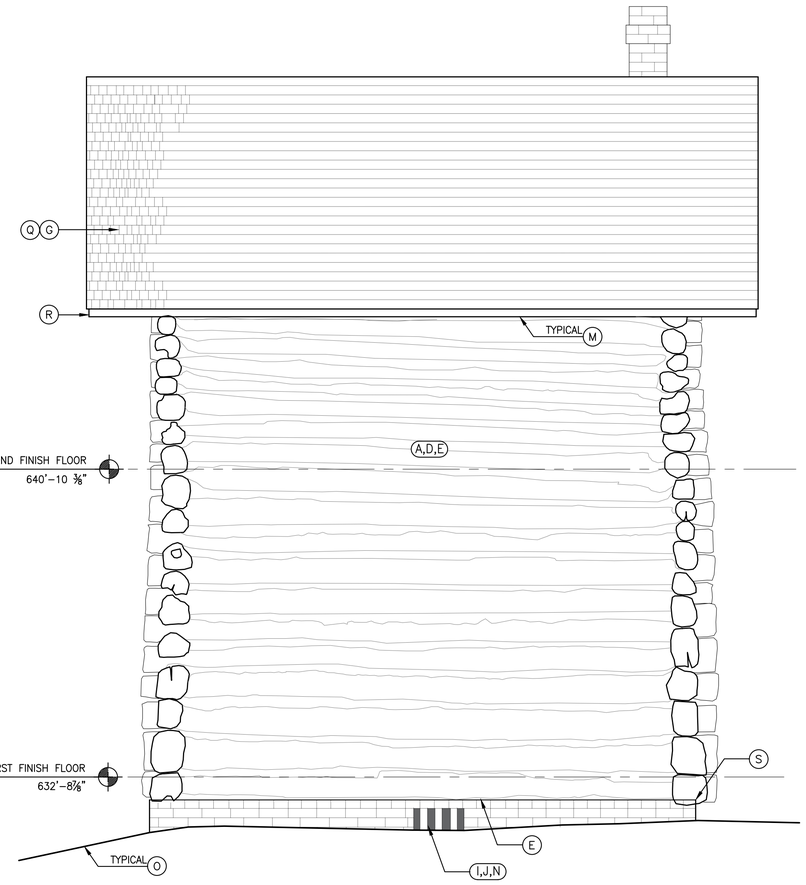
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SUB SHEET NO. T / A24

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-20
TWO-STORY LOG HOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 36 OF 48



1 A25 NORTH ELEVATION
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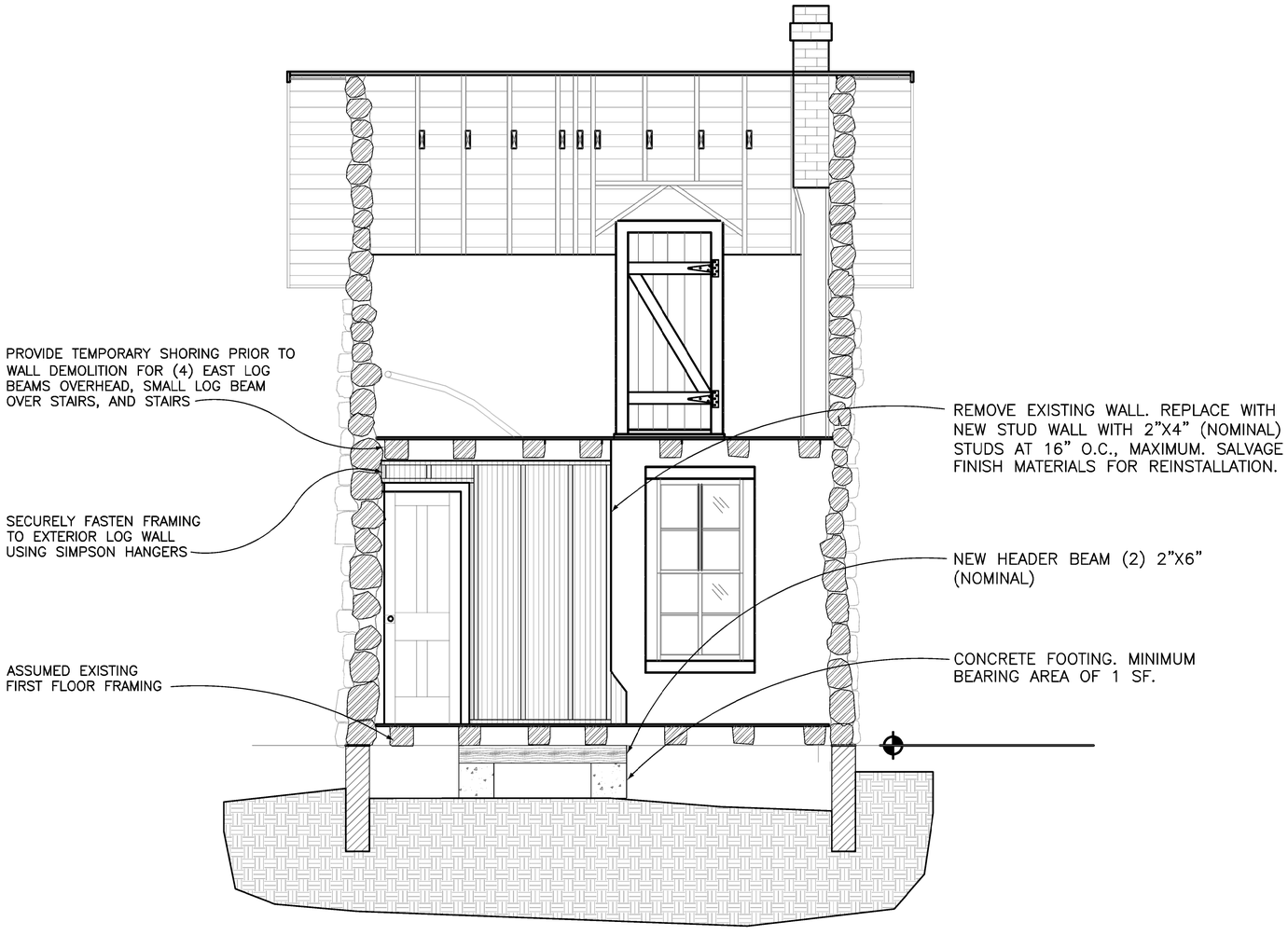
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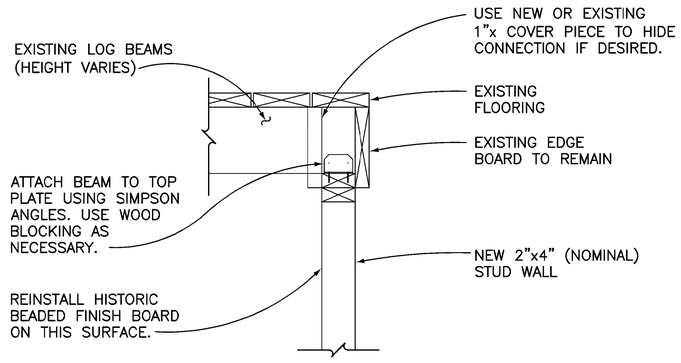
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1 / TS5 BUILDING SECTION
1/2" = 1'-0"

4 0 4 8
SCALE OF FEET



2 / TS5 SECTION AT TOP OF NEW STUD WALL
1 1/2" = 1'-0"

12 6 0 12
SCALE OF INCHES

STRUCTURAL ENGINEERING ASSOCIATES, INC.
1000 WALNUT
SUITE 1570 KANSAS CITY, MO 64106
Ph. 816-421-1042
Fax 816-421-1061

DESIGNED: PDS
CADD: CMS
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Storehouse, ca. 1924. (INDU Museum Collection)

6 TREATMENT RECOMMENDATIONS
Storehouse

Storehouse (HS-21) Treatment Recommendations

Treatment plans and elevations of the Storehouse can be found following this narrative.



Figure 6.5. View of HS-21 Storehouse, East elevation, typical log deterioration and weathering. (STRATA 2017)

The Storehouse is currently used for interpretive display during re-enactments. The building is in good overall condition, requiring maintenance typical of a log structure this age. There are but few early or potentially original components remaining in this building, including one log collar tie, some window trim, and several logs. As part of the overall site treatment, the Storehouse is planned to remain in its continued interpretive use.

There are no immediate preservation or maintenance concerns which would greatly impact the stability or safety of the structure. Both Short and Long Term Treatment Recommendations related to the maintenance and preservation of this structure are recommended. This building is not ADA accessible and the park does not intend to make changes to the accommodation at this time, as the interior can be viewed from the entry door.

Architectural and Structural Recommendations

Short Term Maintenance and Preservation Treatment Recommendations

Refer to the Cost Estimate for Short Term Treatment Recommendations in Appendix K.

1) Conduct a seasonal maintenance inspection of the interior and exterior of the building. Regular inspections will ensure that deficiencies are caught and addressed promptly, alleviating further damage or deterioration.

Exterior:

2) Recommend light media blasting the exterior surface of the logs prior to chemical treatment to remove deteriorated wood. Utilize corn cobs or similar soft media. Test before final treatment.
3) Treat logs with another round of Tim-bor and a top coating of wood protectant. A high-performance wood protectant may include: Armstrong's Wood Stain (Natural); TWP 1500 Series (Natural); or Messmer's UV Plus.[356]
4) Fill checks larger than ¼" with appropriately-sized backer rod and appropriate filler material
5) Daubing:
    a. Option 1: Maintain Portland cement daubing. Replace deteriorated daubing material, in kind. Fill cracks.
    b. Option 2: Remove Portland cement daubing and chinking in its entirety and install new replica chinking and natural daubing mixture.
    c. Option 3: Remove Portland cement daubing and chinking in its entirety and install new synthetic daubing material.
6) Fill open notches at corner to prevent further deterioration (indicated on drawings).
7) Remove existing roofing shingles, abate asbestos underlayment. Repair skipped sheathing, as required. Install new underlayment. Install new wood shingles. Install drip edges, as required.
8) Replace deteriorated wood rake board, in kind. Treat new/replacement wood with Ardec Lifetime wood treatment.
9) Restore historic wood sashes. Install new putty, prep, prime and paint to match the existing color.
10) Inspect insect screening at foundation vents, repair as required.

[356] Magill, Courtney. "Performance Assessment and Evaluation of Hydrophobic and Ultraviolet Protective Treatments for Historic Log Structure." University of Pennsylvania, 2015, 152.

Interior:

11) Install new fire extinguisher.
12) Remove daubing where roof rafters are framed into the roof plate to allow for assessment of the condition of the rafters. The rafters must be securely fastened to the roof plate. Reinstall daubing.

Mechanical/Electrical/Plumbing/Fire Protection Recommendations

Installation of all MEP systems shall be in compliance with all requirements in the 2015 International Building Codes, including 2015 International Fire Code, 2015 International Plumbing Code, 2015 International Mechanical Code, 2015 International Fuel Gas Code, and the 2014 National Electrical Code (NEC).

Electrical Systems

13) A new electrical service should be provided to serve the storehouse. A new 100-amp, 120/240 volt, single phase service entrance rated load center with a NEMA 3R enclosure and a 30 amp main circuit breaker should be surface mounted to the exterior of the north wall. This load center will be fed from below grade from the service disconnect located on the south wall of the brick house. A new grounding system should be installed for the building in compliance with NEC Article 250.
14) Power and lighting branch circuit wiring within the building will be fed from the new main load center by copper conductors routed in surface mounted raceway. New duplex receptacles and light fixtures shall be provided inside the storehouse. A wall mounted occupancy sensor switch shall be utilized for automatic shutoff of the lighting to comply with current energy code requirements.
15) The existing intrusion detection system should be updated as necessary to meet the needs of the facility. Discussion with park services will be required to determine the requirements of the system.
16) The existing telecommunications cables should be traced back to their point of origin and the functionality of the system should be verified.
17) The existing telecommunications cables should be removed, and the floor box should be covered and sealed. The existing below grade conduit may be repurposed if it is found to be in good condition after inspection.
18) A ceiling or wall mounted wireless access point (WAP) will be provided in the storehouse. The WAP will be connected to the new network switch located in the basement of the main house via CAT6 cable routed through a below grade PVC conduit.

Plumbing Systems

No plumbing systems are intended to be added in the Storehouse.

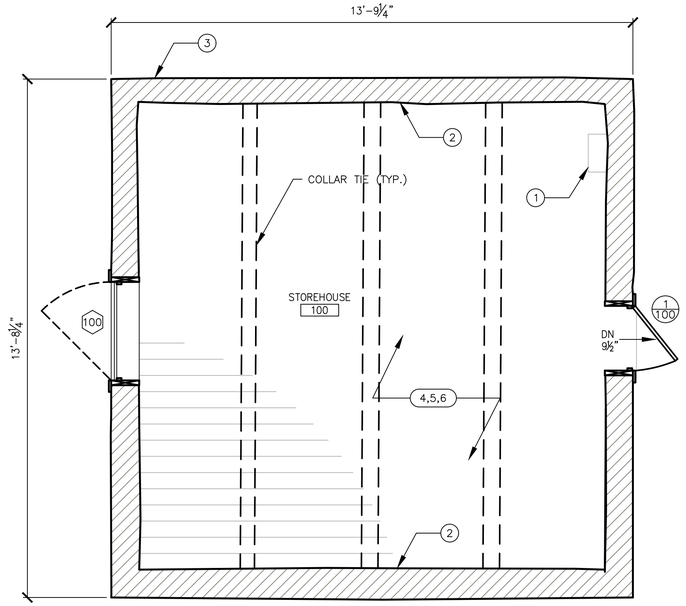
Fire Protection Systems

No fire protection systems are intended to be added for the Storehouse; however, a smoke/fire alarm is recommended.

Long Term Maintenance and Preservation Treatment Recommendations

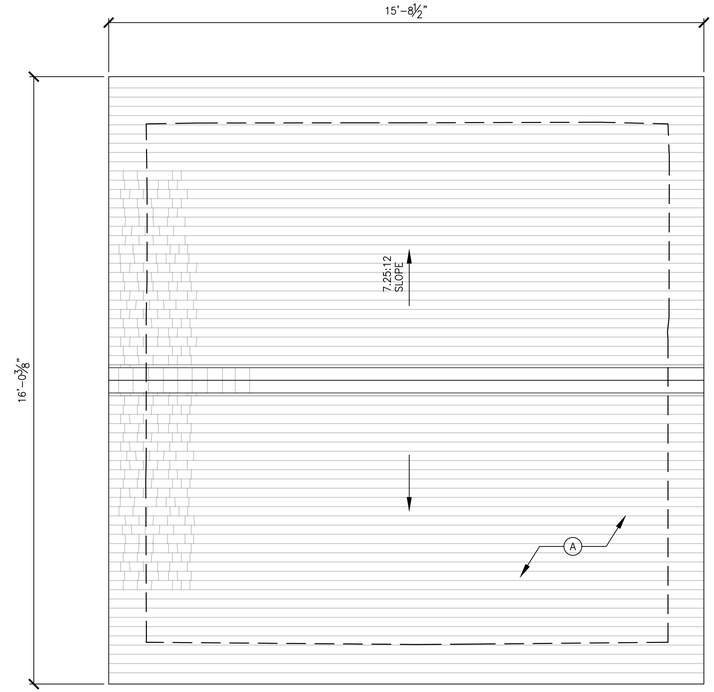
Refer to the Cost Estimate for Long Term Treatment Recommendations in Appendix K.

19) If the log structure is reconstructed, or if the bottom sill logs are replaced, installation of a copper termite shield between the top of the masonry foundation and the logs would be recommended.



1 A26 TREATMENT FIRST FLOOR PLAN
1/2" = 1'-0"

PROJECT NORTH



2 A26 TREATMENT ROOF PLAN
1/2" = 1'-0"

PROJECT NORTH

KEY NOTES STOREHOUSE EXTERIOR:

A. REMOVE EXISTING SHINGLES. ABATE ASBESTOS UNDERLAYMENT. REPAIR SKIP SHEATHING AS REQUIRED. INSTALL NEW ASPHALT PAPER UNDERLAYMENT. INSTALL NEW WOOD SHINGLES. INSTALL DRIP EDGES AS REQUIRED.

B. REPLACE DETERIORATED WOOD RAKE BOARD IN KIND. TREAT NEW/REPLACEMENT WOOD WITH ARDEC LIFETIME WOOD TREATMENT.

C. CLEAN LOGS WITH LIGHT DETERGENT AND SCRUBBING PRIOR TO TREATMENT AND SEALING.

D. INSTALL TIM-BOR WOOD TREATMENT TO ALL EXTERIOR WOOD SURFACES.

E. INSTALL NEW WOOD PRESERVATIVE/SEALER TO ALL EXTERIOR WOOD SURFACES.

F. DAUBING:
OPTION 1: REPAIR PORTLAND-BASED DAUBING IN KIND.
OPTION 2: REMOVE ALL EXISTING PORTLAND DAUBING AND REPAIR/REPLACE CHINKING. INSTALL NEW ORGANIC DAUBING.
OPTION 3: REMOVE ALL EXISTING PORTLAND DAUBING AND REPAIR/REPLACE CHINKING. INSTALL NEW SYNTHETIC DAUBING MATERIAL.

G. RESTORE HISTORIC WOOD SASH. INSTALL NEW PUTTY. PREP, PRIME AND PAINT RED TO MATCH EXISTING.

H. FILL OPEN CHECK IN WOOD LOG SURFACE.

I. FILL OPEN NOTCH TO PREVENT FURTHER WOOD DETERIORATION.

J. INSPECT INSECT SCREENING. REPAIR AS REQUIRED.

K. REPAIR DAUBING

L. LONG TERM: AT NEXT MAJOR RECONSTRUCTION, ADD COPPER TERMITE SHIELD BETWEEN BOTTOM SILL LOG AND FOUNDATION WALL.

KEY NOTES STOREHOUSE INTERIOR:

1. INSTALL NEW FIRE EXTINGUISHER.
2. REMOVE DAUBING WHERE ROOF RAFTERS ARE FRAMED INTO THE ROOF PLATE FOR ASSESSMENT OF THE CONDITION. THE RAFTERS MUST BE SECURELY FASTENED TO THE ROOF PLATE.
3. INSTALL NEW 100 AMP ELECTRICAL SERVICE AND PANEL
4. INSTALL NEW LIGHTING AND RECEPTACLES.
5. INSTALL NEW FIRE/SMOKE DETECTION SYSTEM AND ALARM.
6. INSTALL NEW WIRELESS.

KEY
- (#) DRAWING KEY NOTES
- 000 WINDOW NUMBER
- 000/0 DOOR NUMBER
- 000 ROOM NUMBER
- BRICK/STONE WALL
- LOG WALL
- WOOD FRAME WALL

2 0 2 4
SCALE OF FEET

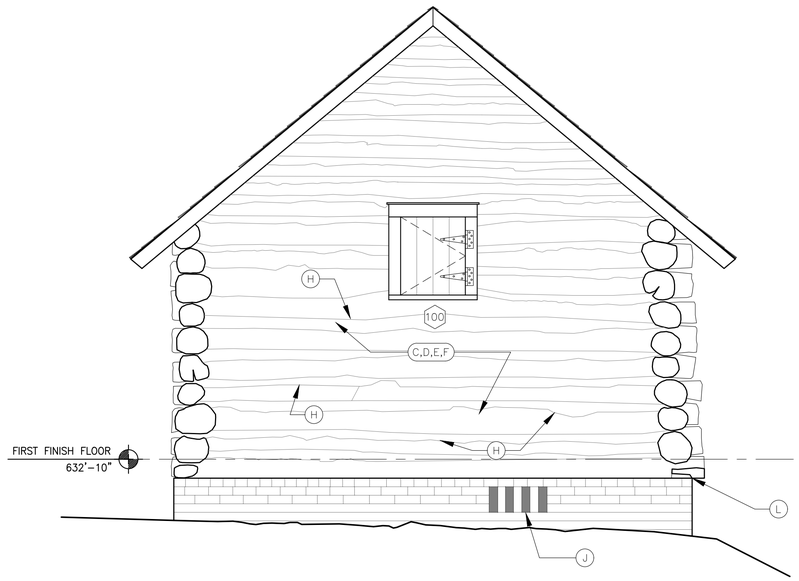
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DESIGNED: CA
CADD: CA
TECH. REVIEW: AG
DATE: 05/07/18

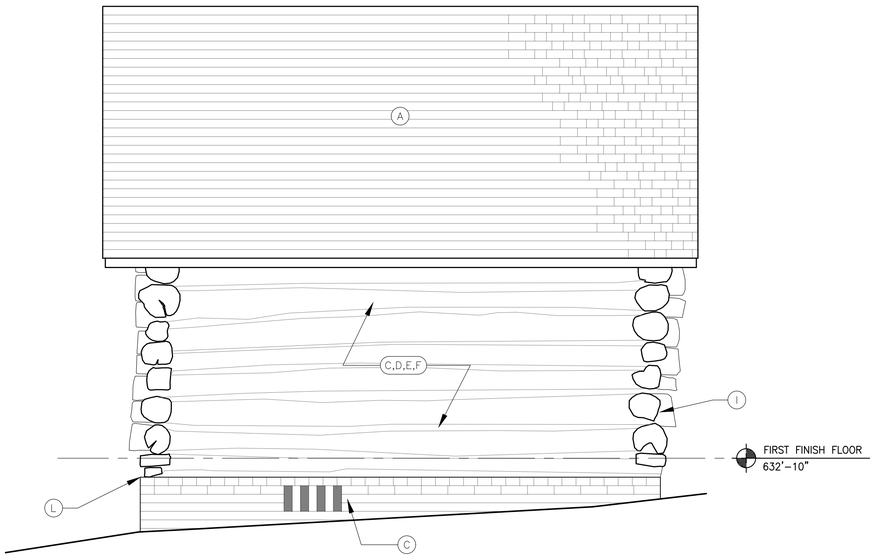
SUB SHEET NO. T A26

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-21
STOREHOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

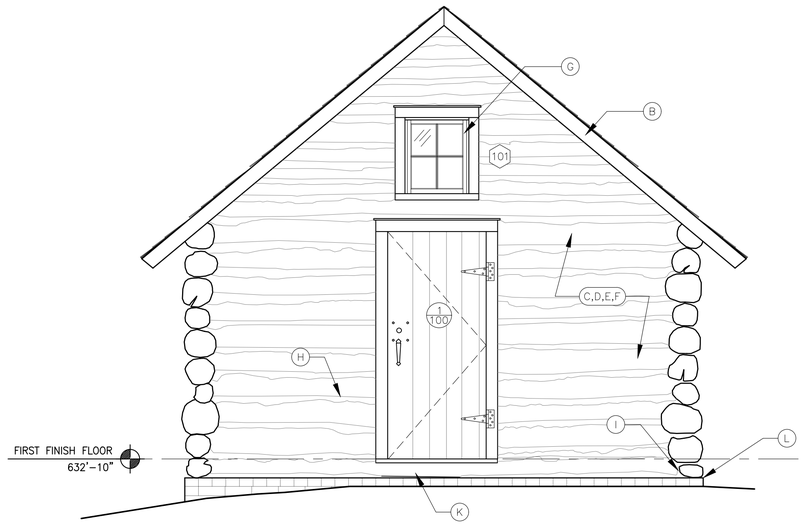
DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 39 OF 48



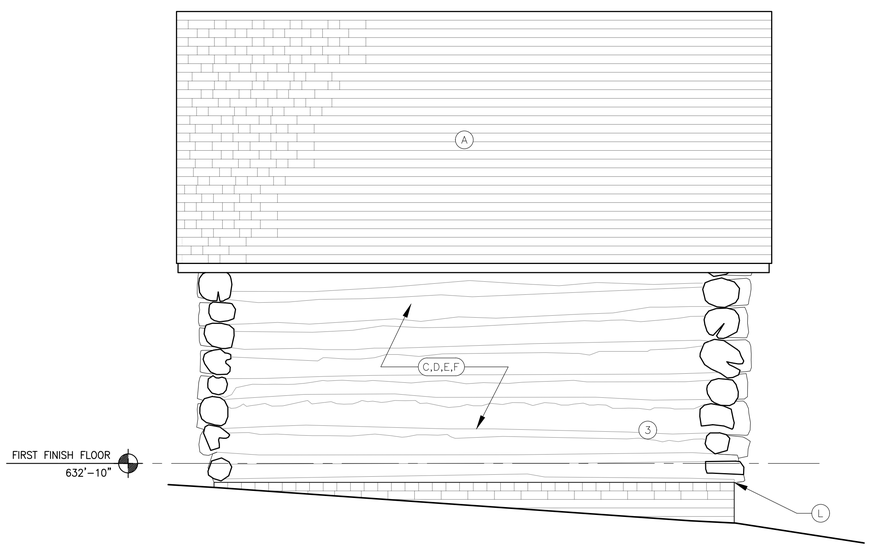
1 A27 TREATMENT WEST ELEVATION
1/2" = 1'-0"



2 A27 TREATMENT SOUTH ELEVATION
1/2" = 1'-0"



3 A27 TREATMENT EAST ELEVATION
1/2" = 1'-0"



4 A27 TREATMENT NORTH ELEVATION
1/2" = 1'-0"

KEY NOTES STOREHOUSE EXTERIOR:

- (A.) REMOVE EXISTING SHINGLES. ABATE ASBESTOS UNDERLAYMENT. REPAIR SKIP SHEATHING AS REQUIRED. INSTALL NEW ASPHALT PAPER UNDERLAYMENT. INSTALL NEW WOOD SHINGLES. INSTALL DRIP EDGES AS REQUIRED.
- (B.) REPLACE DETERIORATED WOOD RAKE BOARD IN KIND. TREAT NEW/REPLACEMENT WOOD WITH ARDEC LIFETIME WOOD TREATMENT.
- (C.) CLEAN LOGS WITH LIGHT DETERGENT AND SCRUBBING PRIOR TO TREATMENT AND SEALING.
- (D.) INSTALL TIM-BOR WOOD TREATMENT TO ALL EXTERIOR WOOD SURFACES.
- (E.) INSTALL NEW WOOD PRESERVATIVE/SEALER TO ALL EXTERIOR WOOD SURFACES.
- (F.) DAUBING:
  OPTION 1: REPAIR PORTLAND-BASED DAUBING IN KIND.
  OPTION 2: REMOVE ALL EXISTING PORTLAND DAUBING AND REPAIR/REPLACE CHINKING. INSTALL NEW NATURAL DAUBING.
  OPTION 3: REMOVE ALL EXISTING PORTLAND DAUBING AND REPAIR/REPLACE CHINKING. INSTALL NEW SYNTHETIC DAUBING MATERIAL.
- (G.) RESTORE HISTORIC WOOD SASH. INSTALL NEW PUTTY. PREP, PRIME AND PAINT RED TO MATCH EXISTING.
- (H.) FILL OPEN CHECK IN WOOD LOG SURFACE.
- (I.) FILL OPEN NOTCH TO PREVENT FURTHER WOOD DETERIORATION.
- (J.) INSPECT INSECT SCREENING. REPAIR AS REQUIRED.
- (K.) REPAIR DAUBING
- (L.) LONG TERM: AT NEXT MAJOR RECONSTRUCTION, ADD COPPER TERMITE SHIELD BETWEEN BOTTOM SILL LOG AND FOUNDATION WALL.

KEY NOTES STOREHOUSE INTERIOR:

1. INSTALL NEW FIRE EXTINGUISHER.
2. REMOVE DAUBING WHERE ROOF RAFTERS ARE FRAMED INTO THE ROOF PLATE FOR ASSESSMENT OF THE CONDITION. THE RAFTERS MUST BE SECURELY FASTENED TO THE ROOF PLATE.
3. INSTALL NEW 100 AMP ELECTRICAL SERVICE AND PANEL
4. INSTALL NEW LIGHTING AND RECEPTACLES.
5. INSTALL NEW FIRE/SMOKE DETECTION SYSTEM AND ALARM.
6. INSTALL NEW WIRELESS.

KEY
- (#) DRAWING KEY NOTES
- (000) WINDOW NUMBER
- (000/0) DOOR NUMBER
- [000] ROOM NUMBER

2 0 2 4
SCALE OF FEET

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SUB SHEET NO. T / A27

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-21
STOREHOUSE
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 40 OF 48



Chapel, ca. 1890. (INDU Museum Collection)

6 TREATMENT RECOMMENDATIONS
CHAPEL

Chapel (HS-22) Treatment Recommendations

Treatment plans and elevations for the Chapel can be found following this narrative.



Figure 6.6. Interior view of HS-22 Chapel. (STRATA 2017)

The Chapel is currently not habitable, due to the condition of the interior. The building exterior is in fair to good overall condition, requiring maintenance typical of a log structure of this age. There are but few early or potentially original components remaining in this building, including approximately 50% or fewer of the wall logs, four window sashes, three roof rafters, wood flooring in the nave, and the Gothic arch cased opening at the apse. As part of the overall site treatment, the Chapel is designated for rehabilitation for use once again as a chapel for small weddings and entertainment events. The goal would be to replicate the historic finishes seen in the ca. 1890 and later photographs. At the time the interior was plastered the wood flooring was painted. Trim was simply profiled. Replication of the historic bottle crown windows in the apse would be a nice touch.

Architectural and Structural Recommendations

Immediate Treatment Recommendations - *Maintenance and Preservation*

Refer to the Cost Estimate for Immediate Treatment Recommendations in Appendix K.

1) Conduct a pest inspection, as carpenter ants were witnessed during the August 2017 site visit. Install treatment, accordingly.
2) Secure all openings into the building to prevent further rodent, squirrel, or bat infestation.

3) Clean out the building debris and stored items to provide a clear view and access for maintenance and inspections.
4) Clean the building from rodent droppings.

Short Term Treatment Recommendations - *Maintenance and Preservation*

Refer to the Cost Estimate for Short Term Treatment Recommendations in Appendix K.

1) Conduct a seasonal maintenance inspection of the interior and exterior of the building. Regular inspections will ensure that deficiencies are noted and addressed promptly, alleviating further damage or deterioration.
2) Recommend light media blasting the exterior surface of the logs prior to treatment to remove deteriorated wood. Utilize corn cobs or similar soft media. Test before final treatment.
3) Treat logs with another round of Tim-bor and a top coating of wood protectant. A high-performance wood protectant may include: Armstrong's Wood Stain (Natural); TWP 1500 Series (Natural); or Messmer's UV Plus.[357]
4) Fill checks larger than ¼" with appropriately-sized backer rod and appropriate filler material
5) Daubing:
    a. Option 1: Maintain Portland cement daubing. Replace deteriorated daubing material, in kind. Fill cracks.
    b. Option 2: Remove Portland cement daubing and chinking in its entirety and install new replica chinking and natural daubing mixture.
    c. Option 3: Remove Portland cement daubing and chinking in its entirety and install new synthetic daubing material.
6) Paint front door.
7) Restore in-swing casement window sashes. Inspect sill for deterioration. If sills require replacement, install new sills to overhang face of building by a minimum of 1 ¼" with a drip edge in the bottom of the new sill. Restore all existing hardware. Consider installation of a new wood storm windows with vertical divider to replicate a mullion, to protect the restored windows. Installation of a fixed wood storm window would prevent operation of the windows, which may or may not be desired.
8) Replace missing roof shingles.
9) Replace missing exterior wall shingles.
10) Repair deteriorated or damaged exterior trim with exterior grade wood. Match all dimensions and profiles. Treat all new wood with preservative and UV protectant.
11) Treat all exterior wood trim with preservative treatment and UV protectant.

[357] Magill, Courtney. "Performance Assessment and Evaluation of Hydrophobic and Ultraviolet Protective Treatments for Historic Log Structure." University of Pennsylvania, 2015, 152.

Long Term Treatment Recommendations - *Rehabilitation*

1) Refer to the Cost Estimate for Long Term Treatment Recommendations in Appendix K.

Exterior:

2) Re-grade for ADA access.
3) Install new 5'-0" x 6'-0" concrete landing to be flush with interior finished floor.
4) Install new exterior light appropriate for the historic building on the exterior.
5) Install new access into crawl space for mechanical and electrical installation. Install new areaway with a drain and new lockable access door.
6) Install new replica decorative crown glass window sashes in apse north and south windows. Consider installation of wood storm windows for protection.
7) Existing roof is repairable condition. When it is time for the next roof replacement in the next 5-7 years, remove existing wood roofing. Abate existing asbestos roofing underlayment. Install new wood shingle roof.
8) Install new half-round gutters and downspouts.
9) Reconstruct foundation vents to have either synthetic frames with screening, or exterior grade wood that is treated with wood preservative and painted to match the decorative cast stone foundation.
10) If sill logs are replaced in the future, install new copper termite shield between top of foundation and new sill log.

Interior:

11) Abate lead based paint. Quantity and extent unknown at this time.
12) Roof Framing:
    a. Simpson straps or similar should be attached to the existing roof purlins in the nave and attached to the log walls of the gable to resist uplift forces.
    b. The roof rafters in the apse should be securely fastened to the wall framing with Simpson type angles or similar. The exterior stud wall framing connections in the apse should also be reinforced. Simpson angles or similar should be used to securely fasten the studs to the exterior log wall.
13) Interior Framing:
    a. The required live load capacity for a Chapel assembly area with moveable seats is 100 psf. The current framing layout in the nave has a calculated live load capacity exceeding 100 psf. The easternmost joist for the nave, however, is not supported by the interior support beams. This joist is directly below the riser to the apse. This joist should have two wood posts added at the locations where the interior beams would have intersected this joist. The loads to the new wood posts would not be great enough to necessitate any additional foundation work.
    b. Inspect underside of apse for structural failure of the west side of the flooring framing. Correct failure and add supplemental framing at the apse to meet live load requirements. The framing for the apse has a calculated live load capacity of 85 psf. Since an apse would not experience an assembly type loading, 85 psf is considered to be an acceptable capacity.

14) Install encapsulant used for treating timber that has been treated with creosote to assist with blocking the strong smell from the interior of the building. Coat only the interior surfaces. Test a small area for compatibility prior to installation.
15) Install new wood vertical furring. Install new mold, moisture, and mildew-resistant drywall wallboard, such as PURPLE drywall. Skim coat walls with plaster finish. Paint walls.
16) Install vents in top and bottom of log walls at each elevation to provide ventilation. Vents to be small, screened pipe installed above the sill log and new the top log. Pipe shall be set flush with the daubing.
17) Install new front door hardware (lock and latch). Install weatherstripping. Verify existing threshold is ADA compliant.
18) Install new replica painted wood baseboard and chair rail.
19) Install new replica painted window and door trim.
20) Restore existing gothic arch cased opening. Install replica lights at cased opening jambs to match historic lights.
21) Remove old wiring. Install new 100-amp electrical service to the building and panel.
22) Install new wiring throughout the building. Provide new receptacles and switches.
23) Install new wireless connectivity into the building.
24) Install new lighting throughout the interior of the building.
25) Install new security and smoke alarm.
26) Repair and paint wood flooring on interior.
27) Install new mechanical ventilation system for heating and air conditioning. Horizontal unit shall be set in the crawl space. Air to be ducted through crawl space and into decorative vents in the floors. Coordinate locations of vents with architect. Install condensing unit east of chapel.
28) Install wall-mounted fire extinguisher.
29) Install insulation at crawl space joists if Chapel is heated.
30) The park has the historic kneeling rails in the museum collection. These could be made available for reproduction for use in the Chapel.

Mechanical/Electrical/Plumbing/Fire Protection Recommendation

Installation of all MEP systems shall be in compliance with all requirements in the 2015 International Building Codes, including 2015 International Fire Code, 2015 International Plumbing Code, 2015 International Mechanical Code, 2015 International Fuel Gas Code, and the 2014 National Electrical Code (NEC).

Mechanical Systems

1) A new heating and cooling system shall be installed to serve the chapel. Refer to main house (HS-18) treatment recommendations for design criteria and a detailed description of the recommended system options.

2) A horizontal fan coil unit or heat pump could be placed in the crawl space below the chapel. The access to the crawl space will likely have to be enlarged to allow for the installation of the unit and for proper access for future maintenance purposes. Supply

and return air to and from the chapel space would be provided by decorative grilles in the floor of the chapel that are ducted back to the unit. The locations of the grilles would be closely coordinated with the Architect and park services to minimize the impact to the historical appearance of the space. A condensing unit (if needed) would be located on grade on the east side of the chapel building. A programmable thermostat should be installed in the chapel for control of the system.

3) Outside air requirements will be minimal for this building and will be handled by natural ventilation. If this is deemed as an unacceptable method by the local AHJ or park services, a duct could be connected from a louver on an exterior sidewall of the chapel to the return air plenum of the fan coil unit. A damper and additional controls would be required for the system to operate properly.

Electrical Systems

4) The existing switch and MC cable should be removed and discarded.

5) A new electrical service should be provided to serve the chapel. A new 100-amp, 120/240 volt, single phase service entrance rated load center with a NEMA 3R enclosure and a 30 amp main circuit breaker should be surface mounted to the exterior of the east wall. This load center will be fed from below grade from the service disconnect located on the south wall of the brick house. A new grounding system should be installed for the building in compliance with NEC Article 250.

6) Power and lighting branch circuit wiring within the building will be fed from the new main load center by copper conductors routed in EMT conduit. MC cable may be utilized for branch circuit wiring as a cost saving alternative. Where branch circuit wiring can't be concealed in walls, surface mounted raceway shall be utilized. New duplex receptacles and light fixtures shall be provided inside the chapel. Wall mounted occupancy sensor switches shall be utilized for automatic shutoff of the lighting to comply with current energy code requirements.

7) A new intrusion detection system should be provided to meet the needs of the facility. Discussion with park services will be required to determine the requirements of the system.

8) A ceiling or wall mounted wireless access point (WAP) will be provided in the chapel. The WAP will be connected to the new network switch located in the basement of the main house via CAT6 cable routed through a below grade PVC conduit.

Plumbing Systems

9) No plumbing systems are intended to be added in the chapel.

Fire Protection Systems

10) No fire protection systems are intended to be added for the chapel; however, a smoke/fire alarm system is recommended to be installed.

Building Code, Life Safety, and ADA Existing Conditions

The Chapel HS-22 is currently unoccupied.

Current Use – Chapel – 'B' Occupancy
Type VB Construction, Un-Sprinklered

Square Footage

Nave	209 sf
Apse	63 sf
Total	272 sf

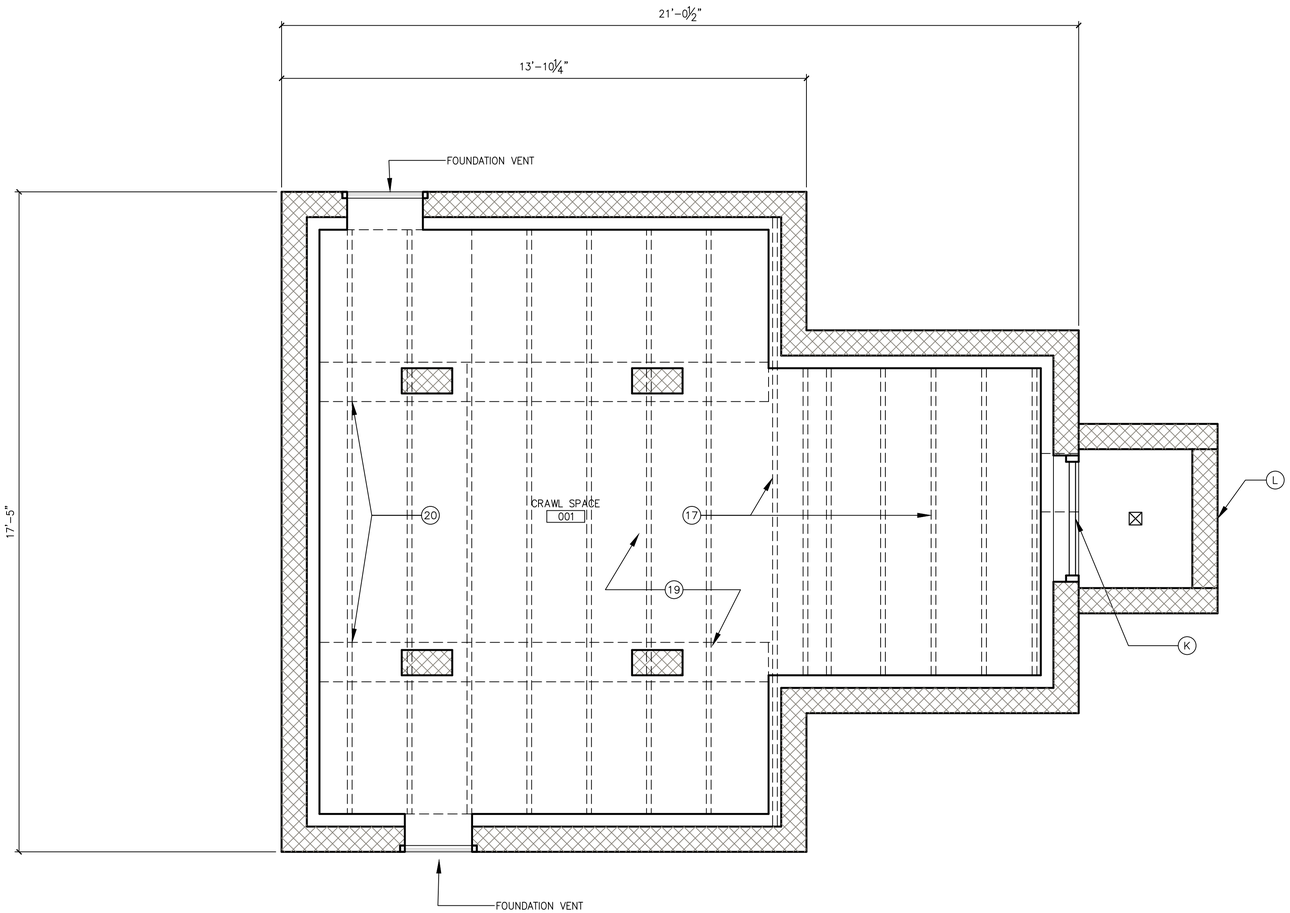
Occupant load for a chapel, per IBC – 272sf / 7 sf (chairs) = 38 persons – Recommended posting limit is 25 persons.

There is currently no smoke or fire alarm, nor are there exit signs or emergency lighting. These are not required, due to the Occupancy and low Occupant Load. Installation of a smoke/fire/security alarm is recommended.

Install a fire extinguisher.

The building is not currently ADA accessible. Install new accessible entry by re-grading and constructing a new concrete landing on the exterior, almost flush with the front entry. The nave will be accessible. The apse is not able to be accessible, as it is eight inches above the nave, which would require an eight-foot-long ramp and take up most of the nave space.

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1 / A28 CHAPEL CRAWL SPACE FLOOR PLAN
1/2" = 1'-0"

PROJECT NORTH

KEY

- (#) DRAWING KEY NOTES
- (000) WINDOW NUMBER
- (000 / 0) DOOR NUMBER
- 000 ROOM NUMBER
- BRICK/STONE WALL
- LOG WALL
- WOOD FRAME WALL

IMMEDIATE TREATMENT GENERAL NOTES:

- CONDUCT A PEST INSPECTION. CARPENTER ANTS WERE WITNESSED DURING AUGUST 2017 SITE VISIT. INSTALL TREATMENT ACCORDINGLY.
- SECURE ALL OPENINGS INTO THE BUILDING TO PREVENT FURTHER RODENT, SQUIRREL, OR BAT INFESTATION.
- CLEAN OUT BUILDING TO PROVIDE CLEAR VIEW AND ACCESS FOR MAINTENANCE AND INSPECTIONS.

SHORT TERM AND LONG TERM GENERAL NOTES:

- CONDUCT SEASONAL MAINTENANCE INSPECTION OF THE INTERIOR AND EXTERIOR OF THE BUILDING.
- ALL REPLACEMENT TRIM TO BE TREATED WITH WOOD PRESERVATIVE ON ALL SURFACES AND ALL CUTS, PRIOR TO INSTALLATION.

SHORT TERM MAINTENANCE AND PRESERVATION TREATMENT KEY NOTES:

A. CLEAN ALL EXTERIOR WOOD. INSTALL WOOD PROTECTANT TO ALL EXTERIOR LOGS AND TRIM, INCLUDING DOOR AND WINDOW TRIM.

B. PAINT FRONT DOOR.

C. FILL CHECKS IN LOGS LARGER THAN ¼" WITH APPROPRIATELY SIZED BACK ROD AND APPROPRIATE FILLER MATERIAL.
DAUBING:
OPTION 1: MAINTAIN PORTLAND CEMENT DAUBING. REPLACE DETERIORATED DAUBING MATERIAL, IN KIND. FILL CRACKS.
OPTION 2: REMOVE PORTLAND CEMENT DAUBING AND CHINKING IN ITS ENTIRETY AND INSTALL NEW REPLICA CHINKING AND NATURAL DAUBING MATERIAL.
OPTION 3: REMOVE PORTLAND CEMENT DAUBING AND CHINKING IN ITS ENTIRETY AND INSTALL NEW SYNTHETIC DAUBING MATERIAL.

D. RESTORE IN-SWING CASEMENT WINDOW SASHES. INSPECT SILL FOR DETERIORATION. IF SILLS REQUIRE REPLACEMENT, INSTALL NEW SILLS TO OVERHANG FACE OF BUILDING BY A MINIMUM OF 1 ¼" WITH A DRIP EDGE IN THE BOTTOM OF THE NEW SILL. RESTORE ALL EXISTING HARDWARE. CONSIDER INSTALLATION OF A NEW WOOD STORM WINDOW TO PROTECT RESTORED WINDOWS, WITH VERTICAL DIVIDER TO REPLICATE A MULLION. INSTALLATION OF A FIXED WOOD STORM WINDOW WOULD PREVENT OPERATION OF THE WINDOWS, WHICH MAY OR MAY NOT BE DESIRED.

E. REPLACE MISSING ROOF SHINGLES.

F. REPLACE MISSING WALL SHINGLES.

G. REPAIR DETERIORATED OR DAMAGED EXTERIOR TRIM WITH EXTERIOR GRADE WOOD. MATCH ALL DIMENSIONS AND PROFILES.

LONG TERM MAINTENANCE AND PRESERVATION TREATMENT KEY NOTES INTERIOR:

1. ABATE LEAD BASED PAINT. QUANTITY AND EXTENT UNKNOWN AT THIS TIME.
2. REMOVE OLD WIRING. INSTALL NEW 100-AMP ELECTRICAL SERVICE TO THE BUILDING AND PANEL.
3. INSTALL NEW WIRING THROUGHOUT THE BUILDINGS. PROVIDE NEW RECEPTACLES AND SWITCHES.
4. INSTALL NEW WIRELESS CONNECTIVITY INTO THE BUILDING.
5. INSTALL NEW LIGHTING THROUGHOUT THE INTERIOR OF THE BUILDING.
6. INSTALL NEW SECURITY AND SMOKE ALARM.
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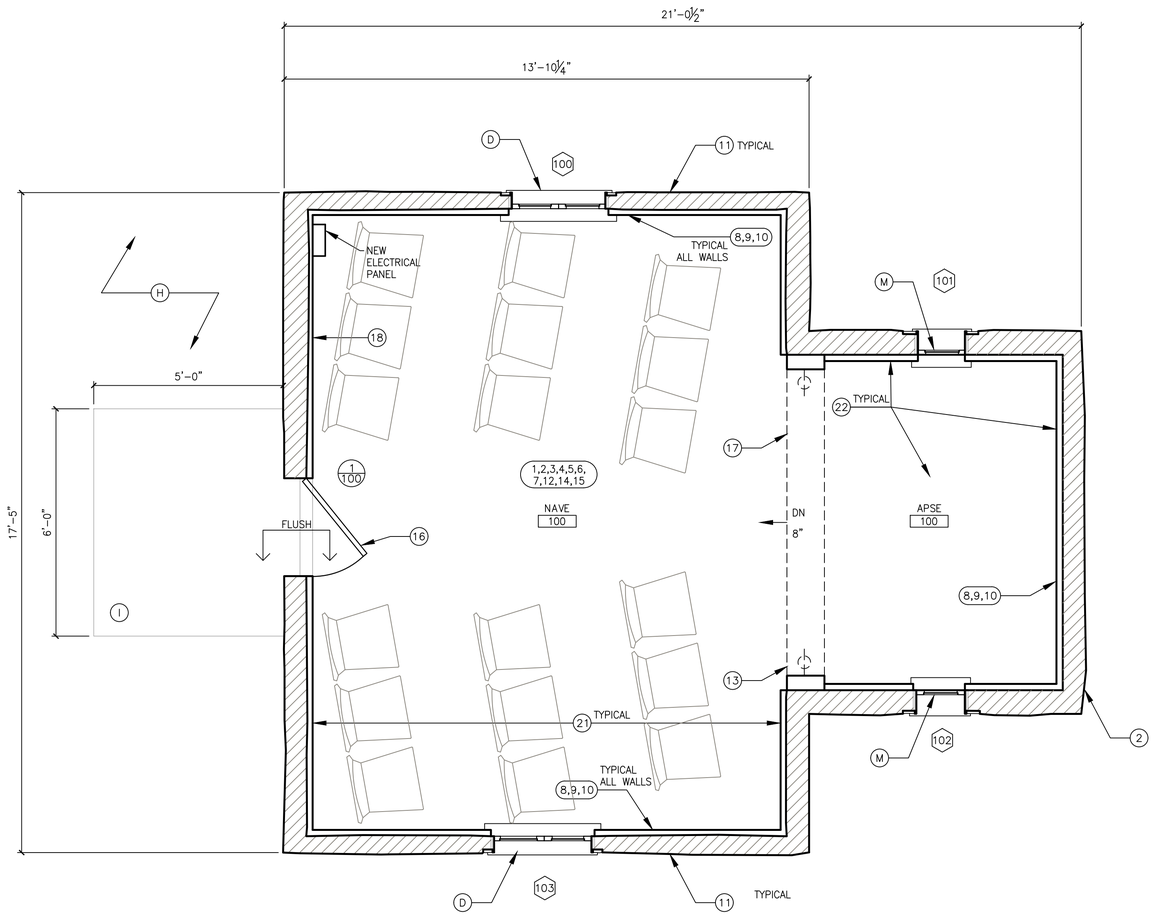
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DESIGNED: CA
DRAWN: CA
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SUB SHEET NO. T / A28

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-22
CHAPEL
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 41 OF 48



1/A29 FIRST FLOOR PLAN
1/2" = 1'-0"

PROJECT NORTH

KEY	
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000/0	DOOR NUMBER
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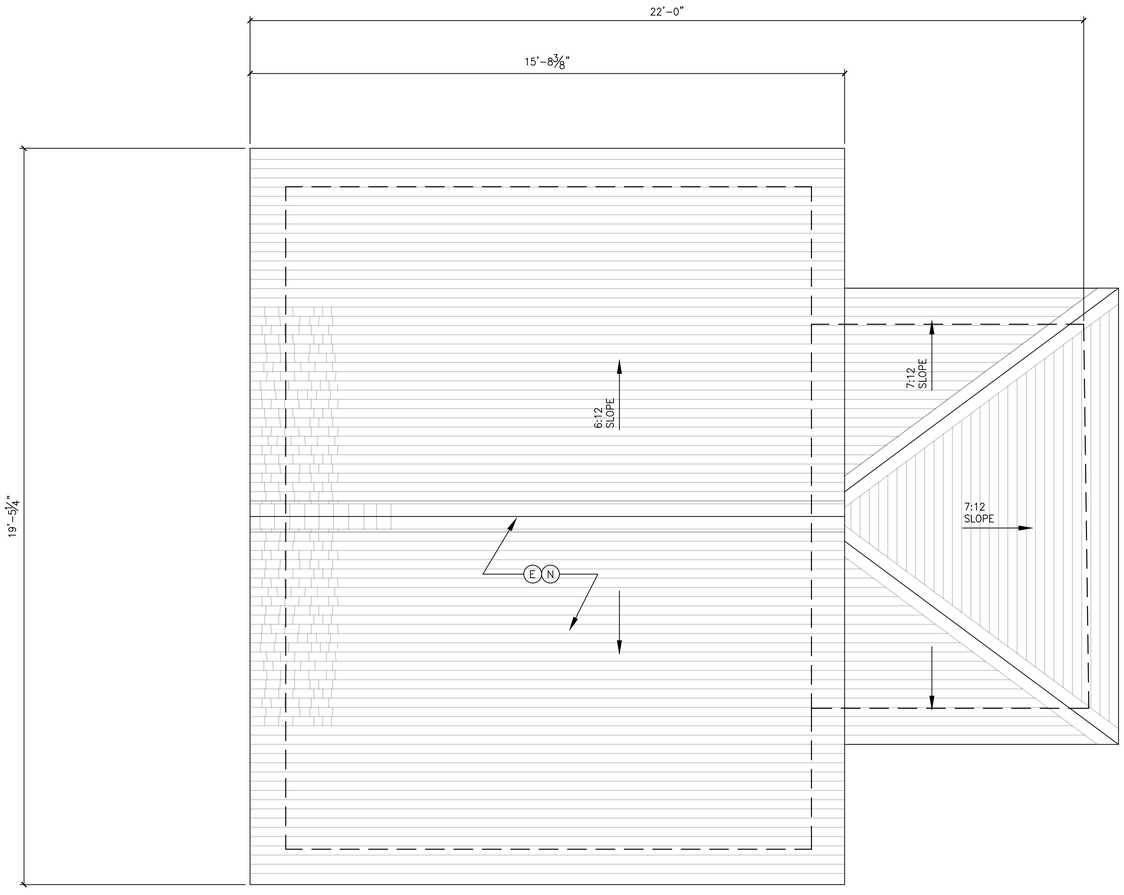
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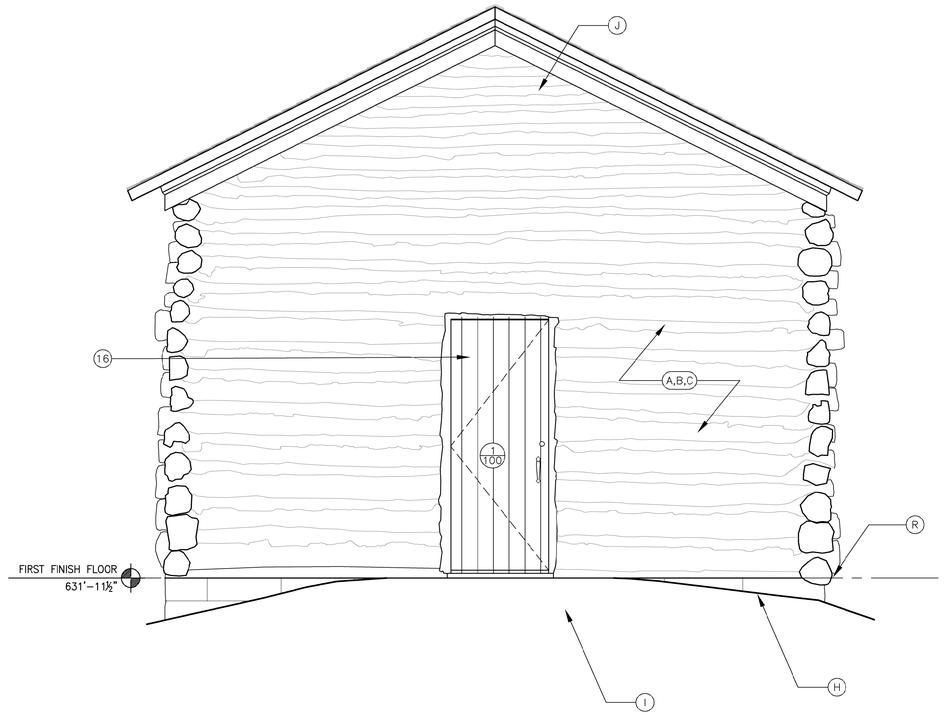
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M. INSTALL NEW REPLICA DECORATIVE CROWN GLASS WINDOW SASHES IN APSE NORTH AND SOUTH WINDOWS. CONSIDER INSTALLATION OF WOOD STORM WINDOWS FOR PROTECTION. FURTHER RESEARCH IS NEEDED TO VERIFY HISTORIC GLAZING DETAILS.

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O. INSTALL NEW WOOD SHINGLE ROOF.

P. INSTALL NEW HALF-ROUND GUTTERS AND DOWNSPOUTS.

Q. RECONSTRUCT FOUNDATION VENTS TO HAVE EITHER SYNTHETIC FRAMES WITH SCREENING, OR EXTERIOR GRADE WOOD THAT IS TREATED WITH WOOD PRESERVATIVE AND PAINTED TO MATCH THE DECORATIVE CAST STONE FOUNDATION.

R. IF SILL LOGS ARE REPLACED IN THE FUTURE, INSTALL NEW COPPER TERMITE SHIELD BETWEEN TOP OF FOUNDATION AND NEW SILL LOG.

2 0 2 4
SCALE OF FEET

KEY
- (#) DRAWING KEY NOTES
- 000 WINDOW NUMBER
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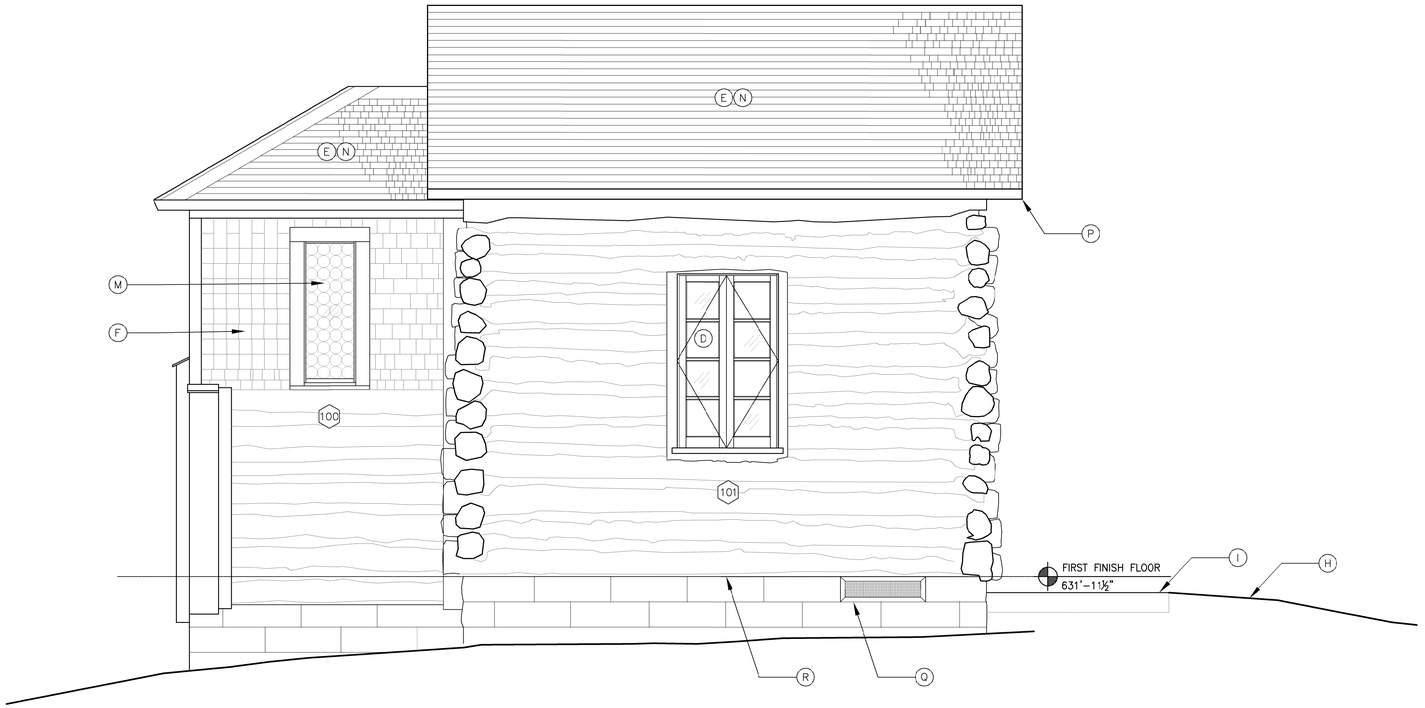
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DESIGNED: CA
CADD: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T / A31

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
HS-22
CHAPEL
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 44 OF 48



1 A32 NORTH ELEVATION
1/2" = 1'-0"

IMMEDIATE TREATMENT GENERAL NOTES:

- CONDUCT A PEST INSPECTION. CARPENTER ANTS WERE WITNESSED DURING AUGUST 2017 SITE VISIT. INSTALL TREATMENT ACCORDINGLY.
- SECURE ALL OPENINGS INTO THE BUILDING TO PREVENT FURTHER RODENT, SQUIRREL, OR BAT INFESTATION.
- CLEAN OUT BUILDING TO PROVIDE CLEAR VIEW AND ACCESS FOR MAINTENANCE AND INSPECTIONS.

SHORT TERM AND LONG TERM GENERAL NOTES:

- CONDUCT SEASONAL MAINTENANCE INSPECTION OF THE INTERIOR AND EXTERIOR OF THE BUILDING.
- ALL REPLACEMENT TRIM TO BE TREATED WITH WOOD PRESERVATIVE ON ALL SURFACES AND ALL CUTS, PRIOR TO INSTALLATION.

SHORT TERM MAINTENANCE AND PRESERVATION TREATMENT KEY NOTES:

A. CLEAN ALL EXTERIOR WOOD. INSTALL WOOD PROTECTANT TO ALL EXTERIOR LOGS AND TRIM, INCLUDING DOOR AND WINDOW TRIM.

B. PAINT FRONT DOOR.

C. FILL CHECKS IN LOGS LARGER THAN ¼" WITH APPROPRIATELY SIZED BACK ROD AND APPROPRIATE FILLER MATERIAL.
DAUBING:
OPTION 1: MAINTAIN PORTLAND CEMENT DAUBING. REPLACE DETERIORATED DAUBING MATERIAL, IN KIND. FILL CRACKS.
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E. REPLACE MISSING ROOF SHINGLES.

F. REPLACE MISSING WALL SHINGLES.

G. REPAIR DETERIORATED OR DAMAGED EXTERIOR TRIM WITH EXTERIOR GRADE WOOD. MATCH ALL DIMENSIONS AND PROFILES.

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4. INSTALL NEW WIRELESS CONNECTIVITY INTO THE BUILDING.
5. INSTALL NEW LIGHTING THROUGHOUT THE INTERIOR OF THE BUILDING.
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7. PAINT WOOD FLOORING ON INTERIOR.
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11. INSTALL NEW REPLICA PAINTED WOOD BASEBOARD AND CHAIRRAIL.
12. INSTALL NEW REPLICA PAINTED WINDOW AND DOOR TRIM.
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14. INSTALL NEW MECHANICAL VENTILATION SYSTEM FOR HEATING AND AIR CONDITIONING. HORIZONTAL UNIT SHALL BE SET IN THE CRAWL SPACE. AIR TO BE DUCTED THROUGH CRAWL SPACE AND INTO DECORATIVE VENTS IN THE FLOORS. COORDINATE LOCATIONS OF VENTS WITH ARCHITECT.
15. INSTALL CONDENSING UNIT EAST OF CHAPEL.
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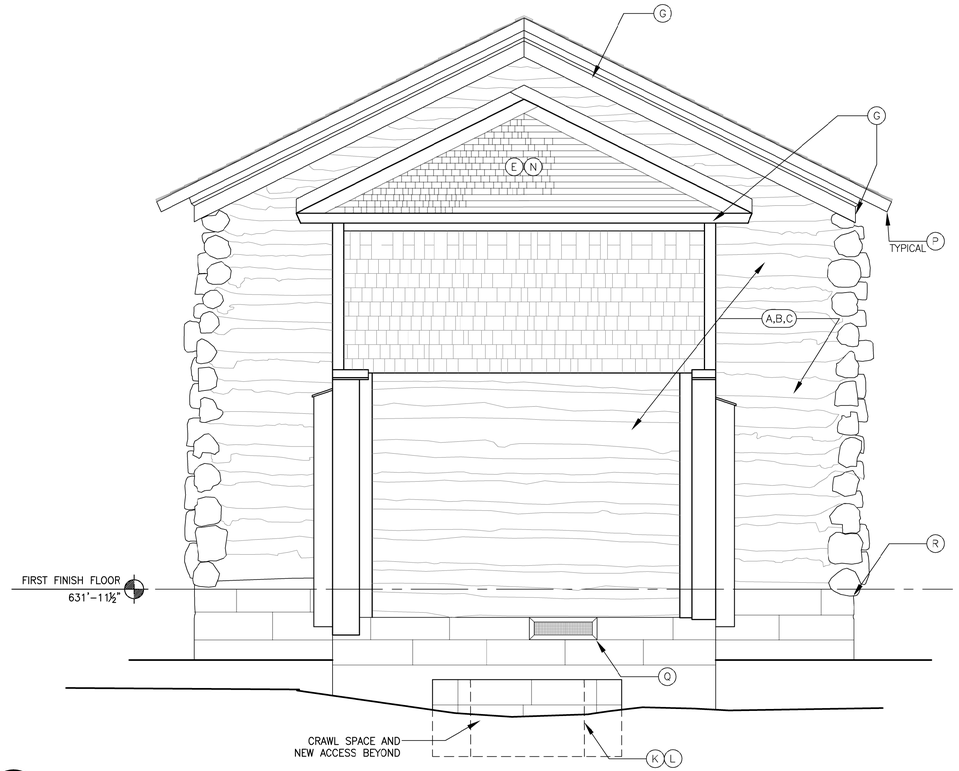
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DRAWING NO. 626 138617
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SHEET 45 OF 48



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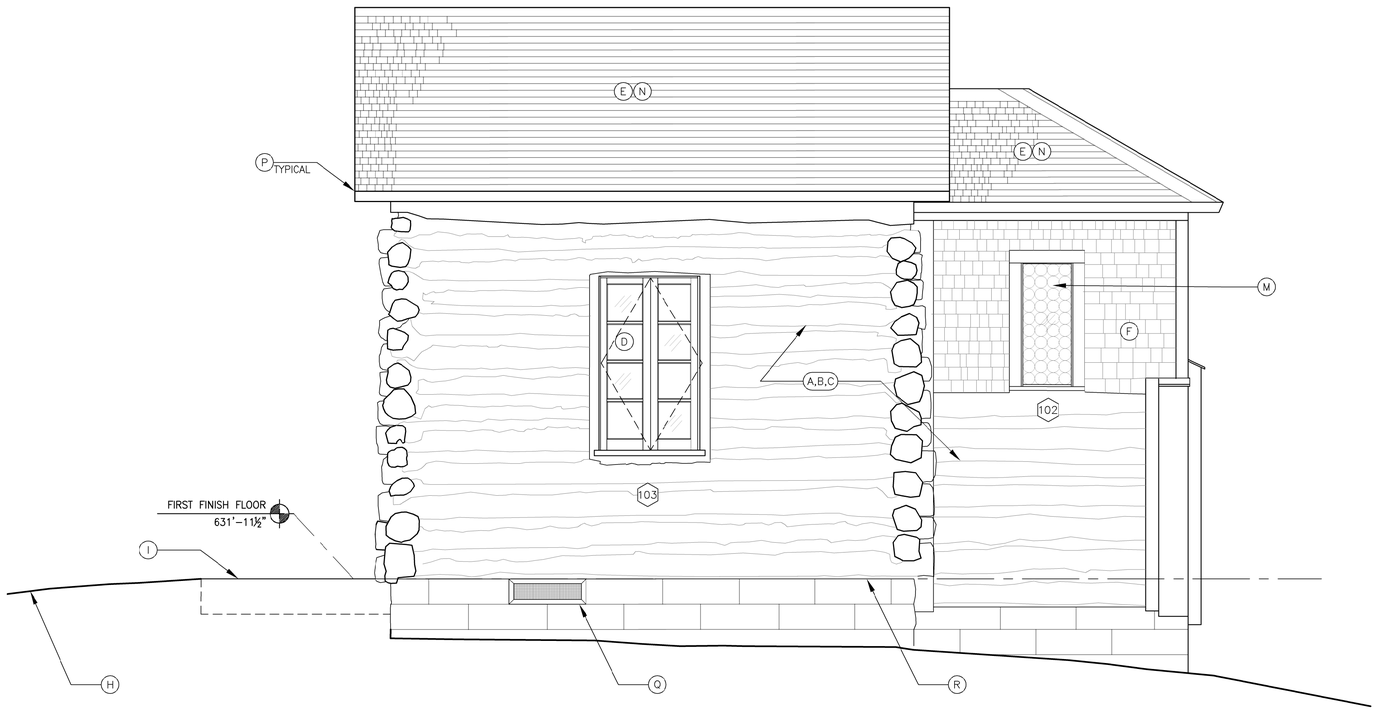
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DRAWING NO. 626 / 138617
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SHEET 46 OF 48



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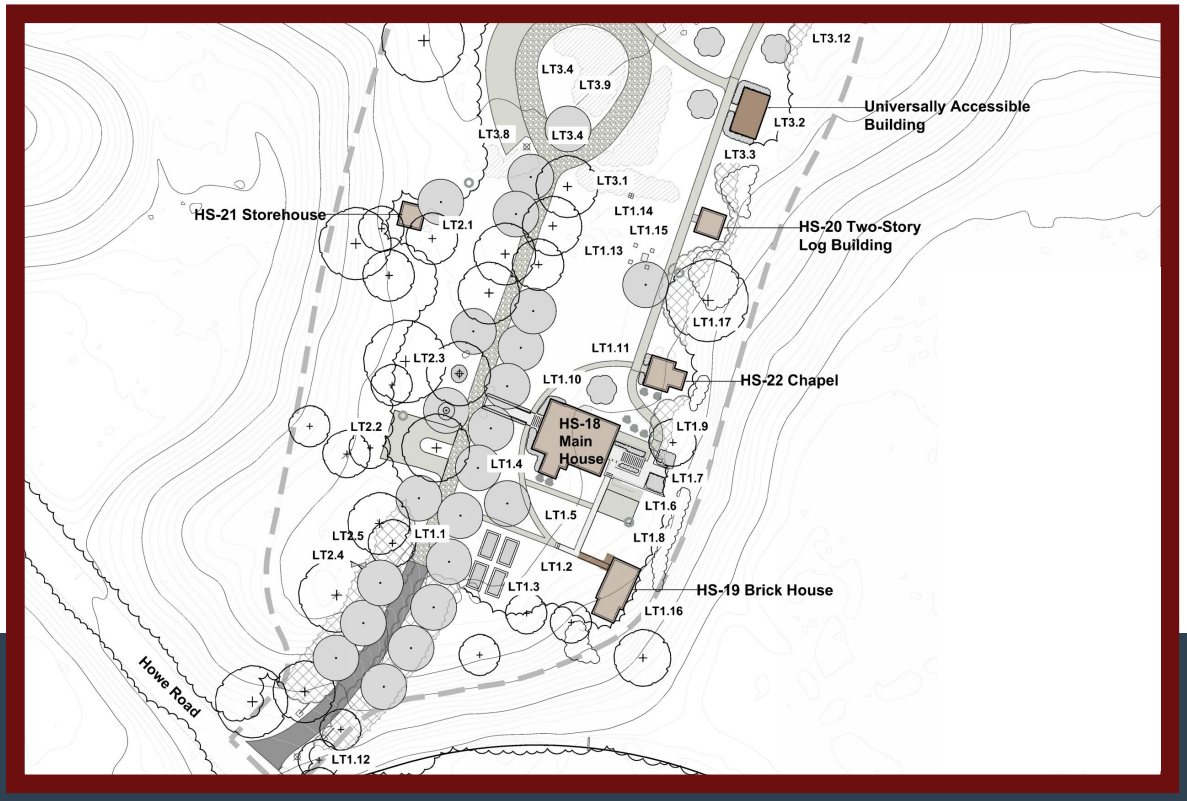
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DRAWING NO. 626 / 138617
PMIS/PKG NO. 20940
SHEET 47 OF 48



Locator Map of new accessible unit. (QEA 2017)

6 PROPOSED NEW UNIVERSALLY ACCESSIBLE UNIT

Proposed New Universally Accessible Overnight Accommodations

Treatment plans for the proposed unit can be found following this narrative.

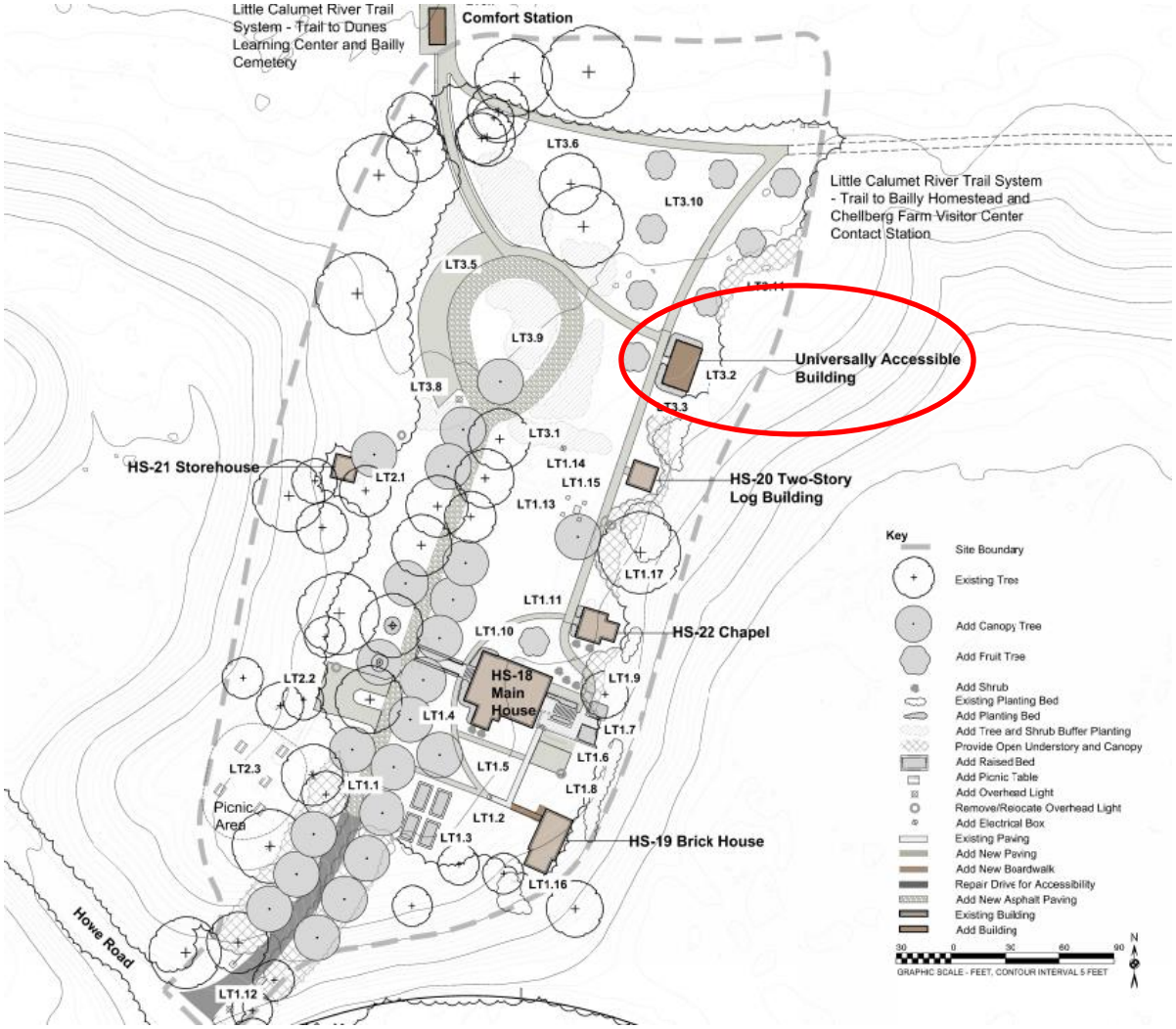
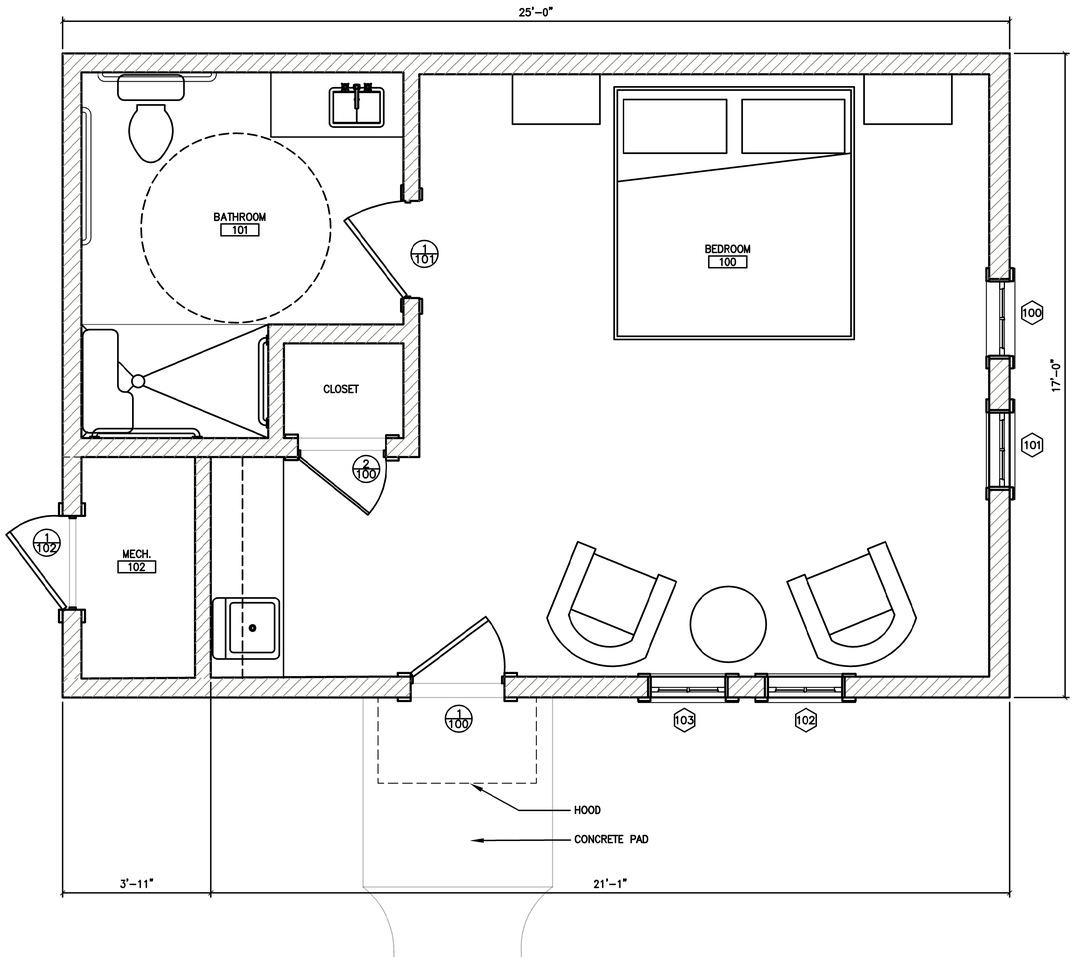


Figure 6.7. Locator Map for new accessible unit. (STRATA 2017)

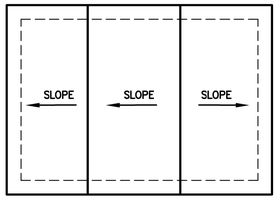
The proposed new universally accessible overnight accommodations unit would be constructed north of the main core of the homestead, within the Landscape Treatment Zone 3. This would allow the new structure to be tucked into the existing terrain and landscape, without distracting from the historic views in the core of the homestead.

The new unit would contain one bedroom and a full bathroom. Accessible parking would be available nearby in the circle drive with an accessible path to the structure. The unit would be designed as a wood frame structure with wood siding (either vertical board and batten to mimic an outbuilding or clapboard siding). It would be a gabled structure with a shed addition on the north side. The building will be required to have a fire alarm and fire suppression system.

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1 / A1 PROPOSED FIRST FLOOR PLAN
1/2" = 1'-0"



ROOF KEY PLAN

PROPOSED ADA UNIT OPTION

2 0 2 4
SCALE OF FEET

STRATA
ARCHITECTURE + PRESERVATION
1701 Ock Street, Suite 100
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www.strata-arch.com

DESIGNED: CA
CADD: CA
TECH. REVIEW: AG
DATE: 05/07/18

SUB SHEET NO. T A35

TITLE OF SHEET
TREATMENT RECOMMENDATIONS
ADA PROPOSED UNIT
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA

DRAWING NO. 626 138617
PMIS/PKG NO. 20940
SHEET 48 OF 48



Bailly Homestead, view looking southeast. (STRATA 2017)

7 LANDSCAPE TREATMENT IMPLEMENTATION

Chapter 7 | Landscape Treatment Implementation

Introduction

This chapter provides guidance for implementing the landscape treatment recommendations identified in Chapter 5. The implementation plan organizes the treatment recommendation tasks into project groups to guide prioritization and preparation of Project Management Information System (PMIS) project statements.

Project Groups 1 through 3 are presented in the order of priority recommended for implementation. Project Groups 4 and 5 could be implemented at any time that funding and staff (NPS or volunteer) supporting long-term maintenance are available.

For each project group, a brief description of the treatment is followed by a list of tasks corresponding to those described more fully in Chapter 5.

Locations of projects are illustrated in Figures 7.1 through 7.6.

Project Group 1: Immediate Treatment

Immediate (Priority) Treatment Tasks are those that address known risks to health and safety or emergency protection of resources from known threats (Figure 7.1). These address maintenance and repair of existing features and removal of inappropriate features.

Project Group 1 Tasks:

PT1: Remove or prune hazardous trees.
PT2: Stabilize and rehabilitate southern portion of site Entry Drive.

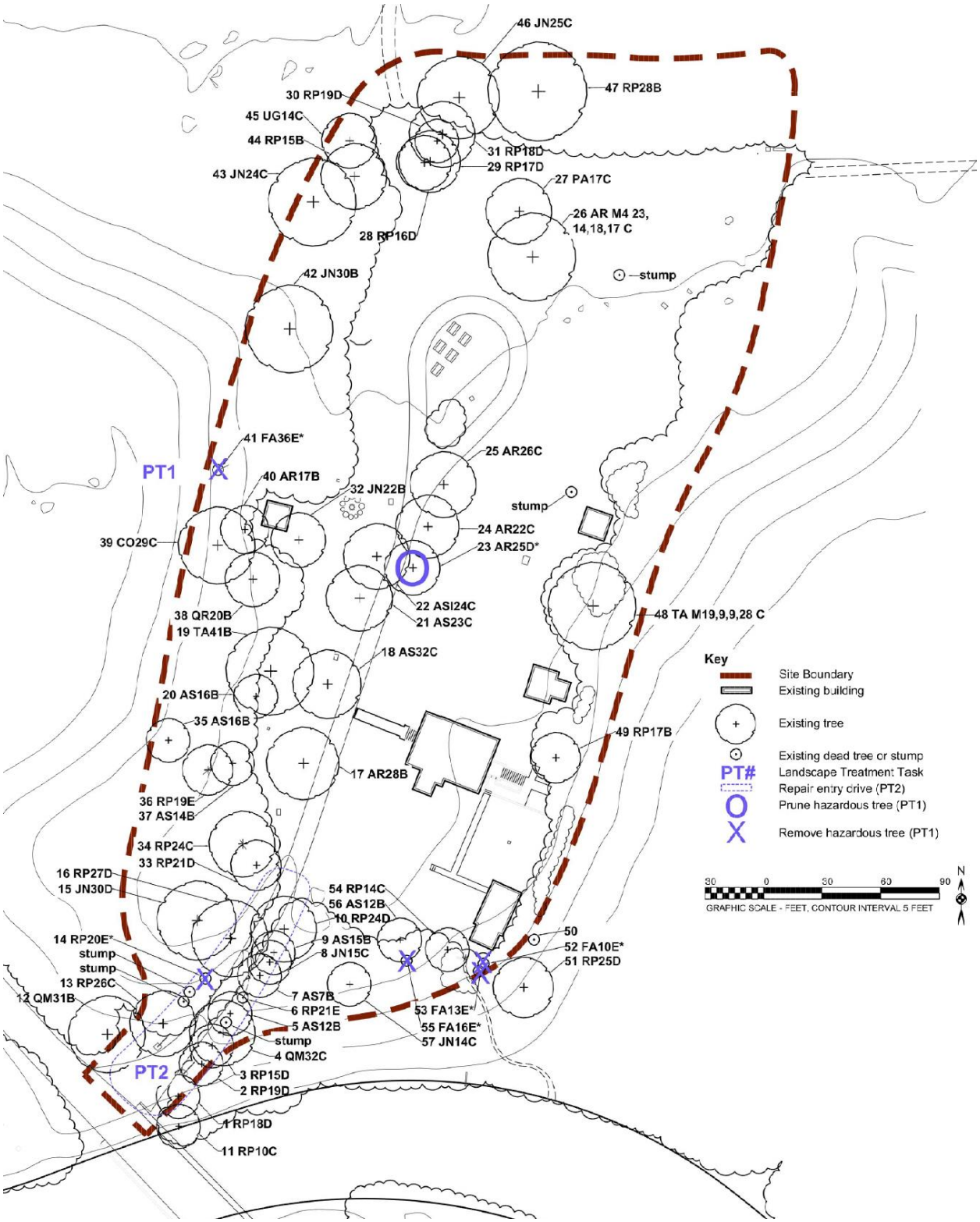


Figure 7.1. Project Group 1: Immediate Treatment. (QEA 2018)

Project Group 2: Rehabilitation for Programmed Use

Project Group 2 includes the rehabilitation of buildings and landscape for programmed use (Figure 7.2). This includes rehabilitating four historic buildings, adding a universally accessible building, rehabilitating the remainder of the site driveway, adding parking, universally accessible paths, foundation plantings, screening, canopy trees, and interpretive landscape features. Universally accessible routes are provided in Project Group 2 (Figure 7.3).

Project Group 2 Tasks:

LT1.1. Rehabilitate the Entry Drive and Allée on the homestead plateau.
LT1.2. Add walk to Brick House (and Universally Accessible option).
LT1.4. Rehabilitate walk connections between Brick House, Main House, and Chapel.
LT1.5. Rehabilitate walk south of Main House.
LT1.6. Provide Universal Access from existing concrete walk between Main House and Brick House and patio area southeast of Main House.
LT1.7. Rehabilitate concrete patio east of Main House.
LT1.8. Interpret Laundry House location with multiuse patio.
LT1.9. Construct barrier-free walk between Chapel and Main House east patio.
LT1.10. Rehabilitate historic plantings of the Main House grounds.
LT1.11. Rehabilitate historic plantings of the Chapel grounds.
LT1.12. Add overhead light.
LT1.13. Interpret location of non-extant windmill.
LT1.14. Add electric box.
LT1.15. Add walk between Chapel, Two-Story Log Building, and new accessible building north of Landscape Treatment Zone 1.
LT1.16. Monitor erosion of hillside east of the core of the Bailly Homestead.
LT1.17. Preserve tree canopy of Landscape Treatment Zone 1.
LT2.1. Rehabilitate Storehouse vegetation.
LT2.2. Provide universally accessible parking for two vehicles west of the Entry Drive Allée.
LT2.3. Install relocated National Historic Landmark commemorative plaque.
LT2.4. Add fire hydrant.
LT2.5. Preserve tree canopy of Landscape Treatment Zone 2.
LT3.1. Rehabilitate vegetative screening between Landscape Treatment Zones 1 and 3.
LT3.2. Add a universally accessible building for overnight accommodations.
LT3.3. Add ornamental vegetation at the universally accessible building.
LT3.4. Repair the existing access drive.
LT3.5. Add parking area with universally accessible parking.
LT3.6. Add trail connections between the universally accessible building, comfort station, and Little Calumet River Trail System.
LT3.8. Add overhead light.
LT3.12. Preserve tree canopy of Landscape Treatment Zone 3.

Treatment tasks associated with buildings are addressed in Chapter 6.

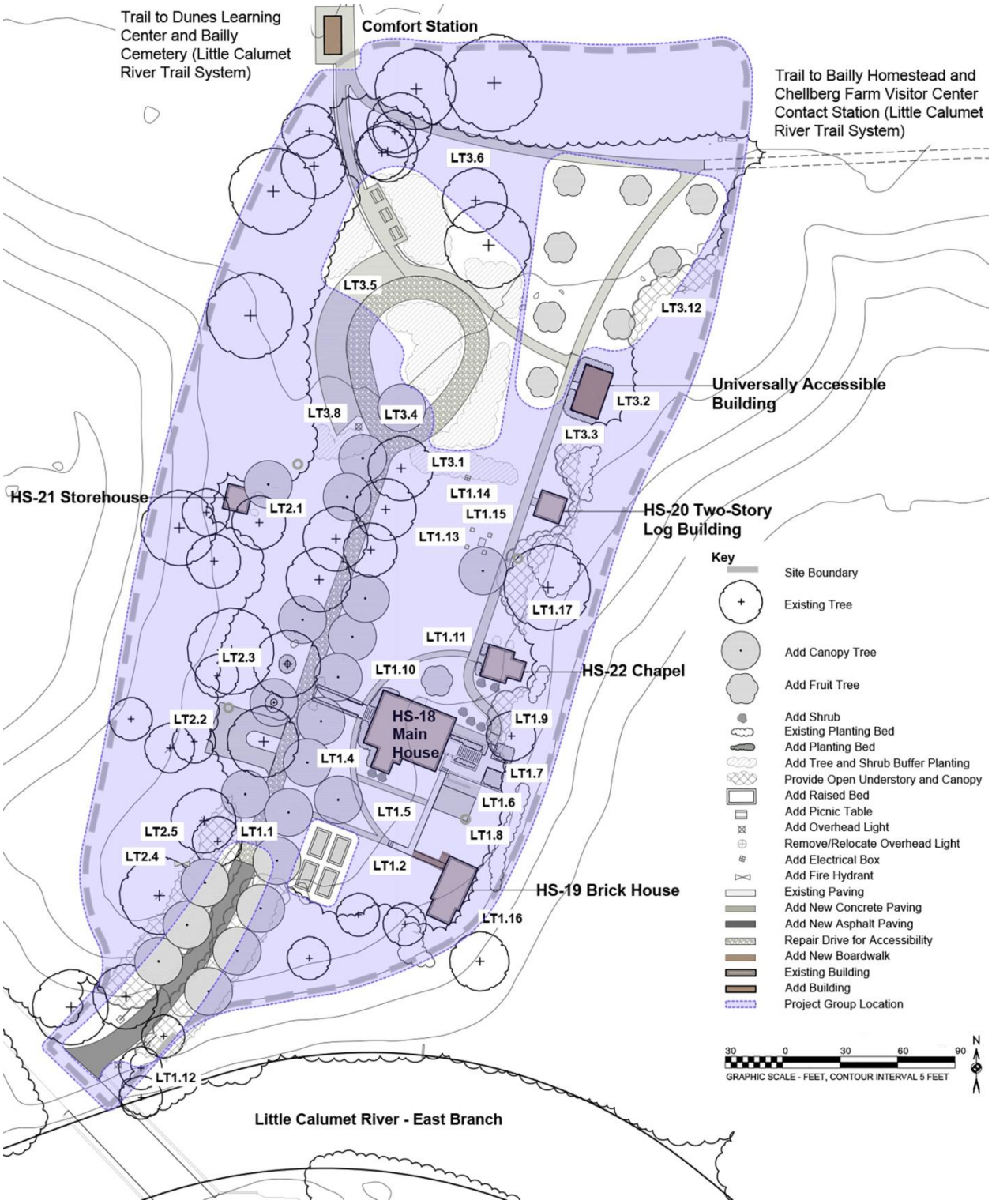


Figure 7.2. Project Group 2: Rehabilitation for Programmed Use. (QEA 2018)

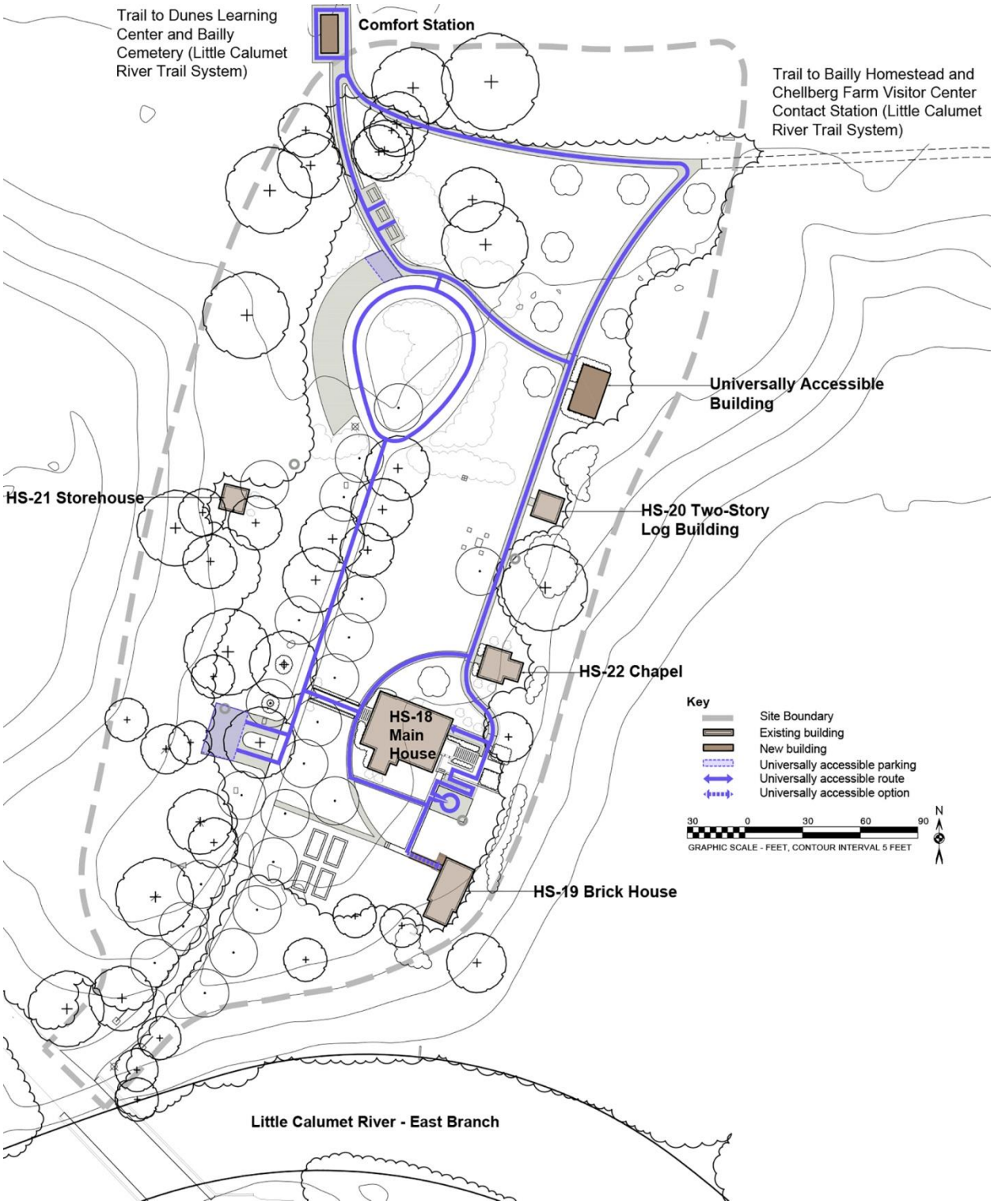


Figure 7.3. Universally Accessible Route. (QEA 2018)

Project Group 3: Comfort Station and Picnic Area

Project Group 3 includes the addition of a picnic area and an accessible comfort station as visitor amenities (Figure 7.4). The picnic area includes establishing an accessible picnic area with three picnic tables between the northern parking area and the comfort station. Provision of the comfort station includes the addition of a two-room unit between the northern parking area and the trail to the Dunes Environmental Learning Center. Screen plantings for the parking area and the comfort station can be added in this project group.

Project Group 3 Tasks:

LT3.7. Add comfort station.
LT3.9. Add screen plantings for parking lot.
LT3.11. Add picnic area.

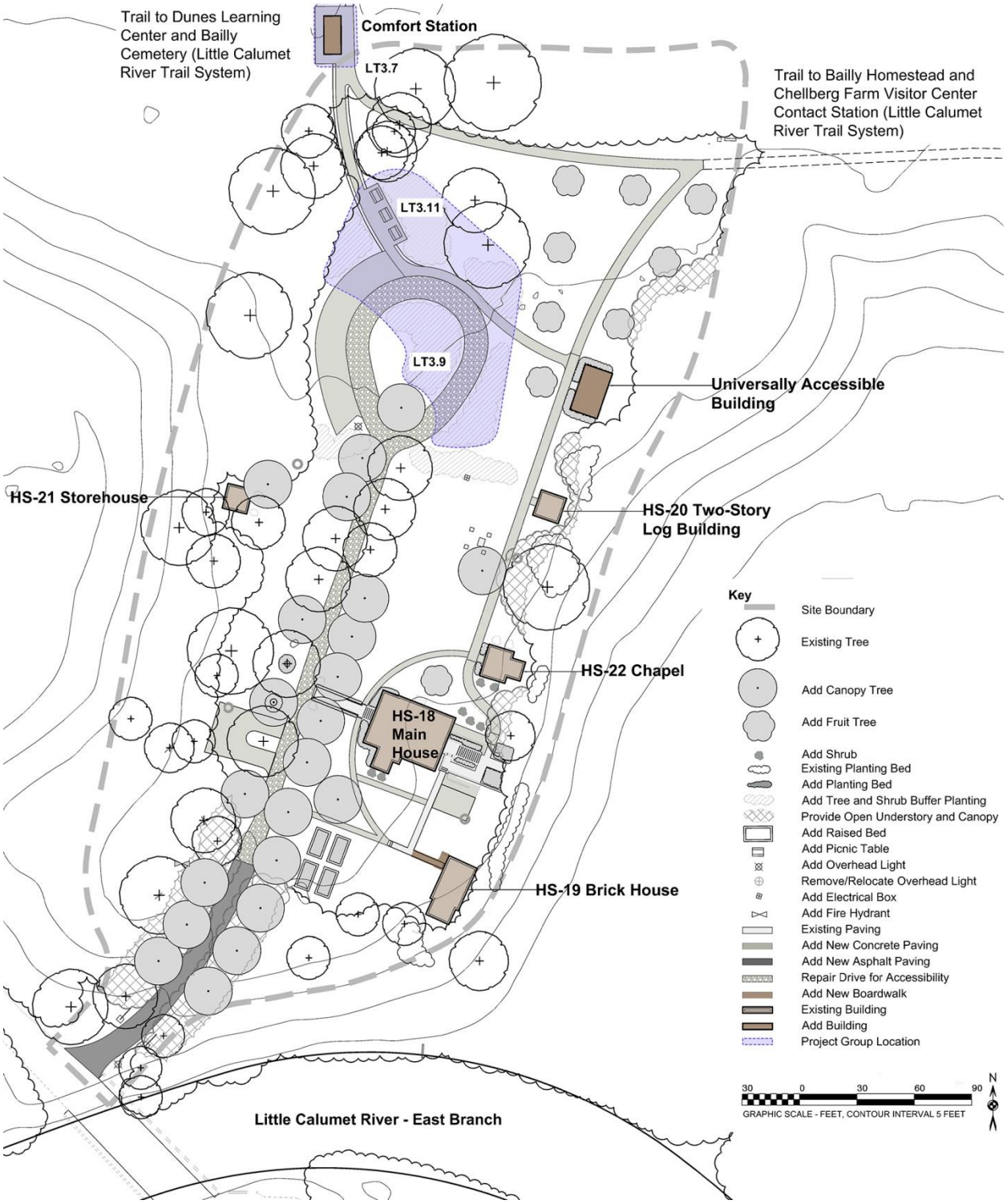


Figure 7.4. Project Group 3: Add Comfort Station and Picnic Area. (QEA 2018)

Project Group 4: Add Fruit Trees

Project Group 4 includes the rehabilitation and interpretation of an orchard in the vicinity of the former fruit orchard (Figure 7.5). Addition of an interpretive orchard would entail planting 8 disease-resistant crabapple trees or mixed species disease-resistant fruit trees. Optionally, the addition of a solar panel orchard in this location may be considered.

Project Group 4 Task:

LT3.10. Rehabilitate and interpret orchard.

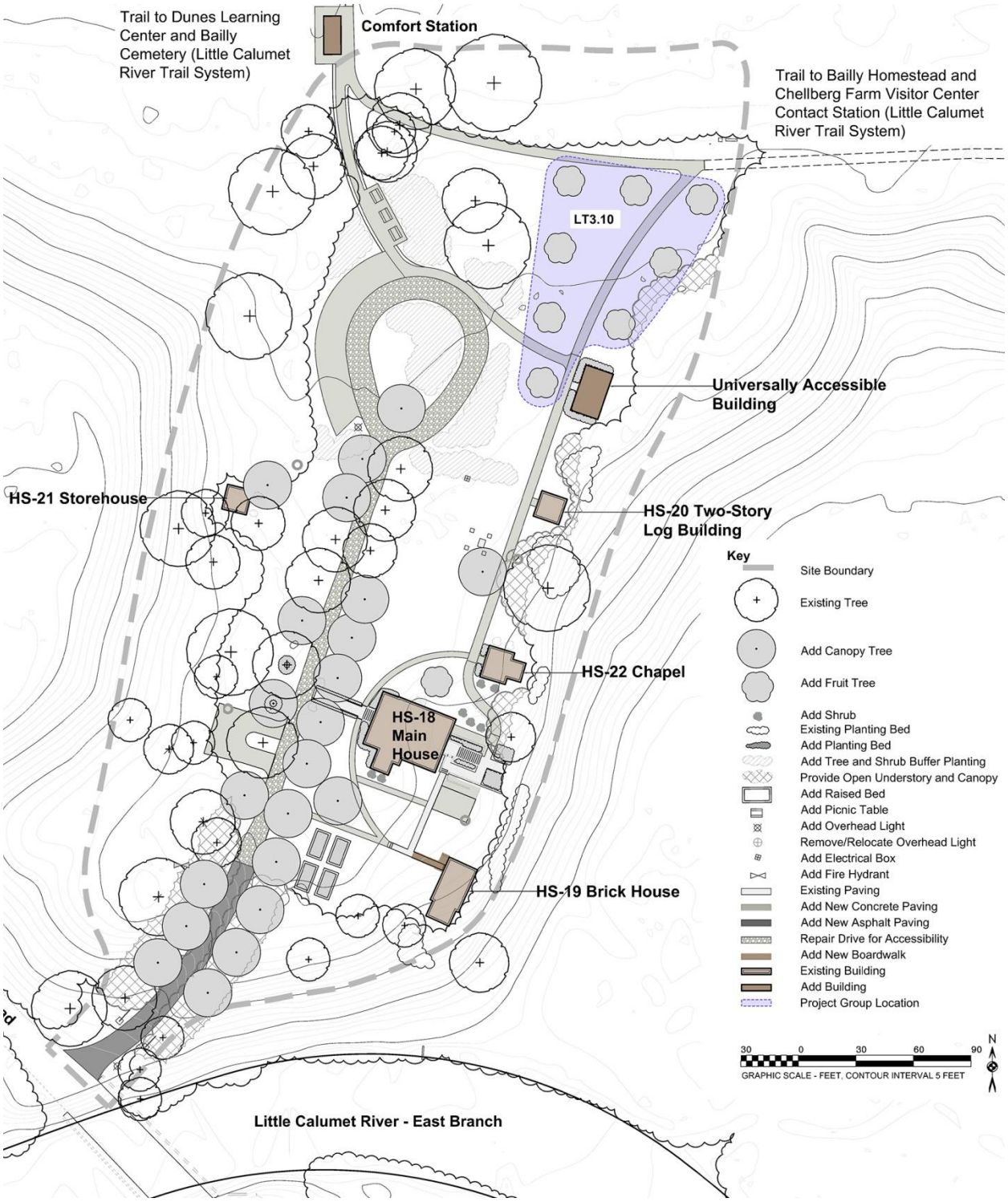


Figure 7.5. Project Group 4: Install and interpret orchard. (QEA 2018)

Project Group 5: Consider Brick House Garden

Project Group 5 includes the consideration of adding a garden in the location of the former rose garden west of the Brick House (Figure 7.6). This includes adding 4 raised beds for vegetable, herb, or flower plantings. Optionally, a single bed of native rose shrubs map be considered.

Project Group 5 Task:

LT1.3. Consider Brick House garden.

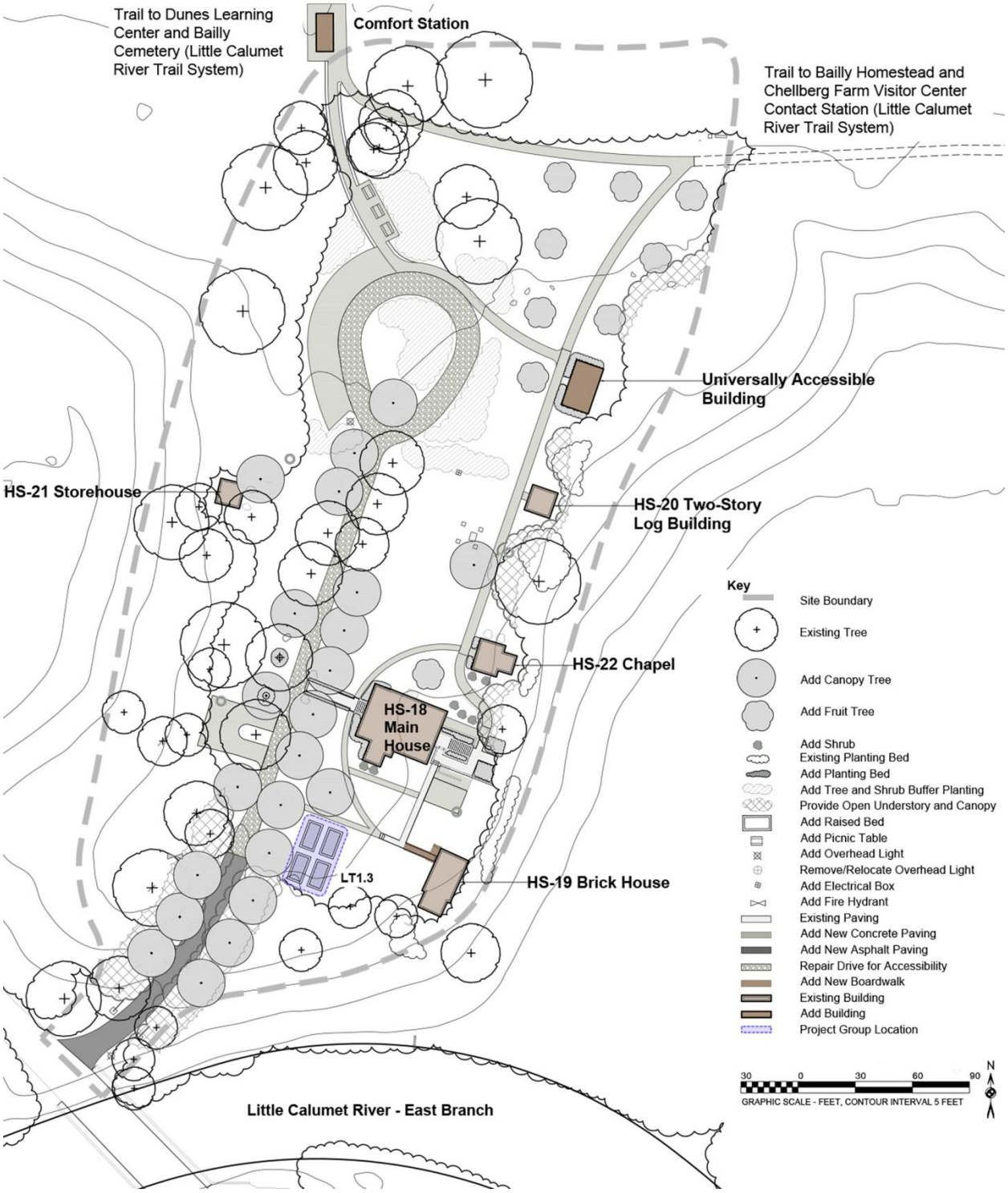


Figure 7.6. Project Group 5: Consider Brick House garden. (QEA 2018)



Floor detail in Main House between Stair Hall 200 and Room 203 . (STRATA 2017)

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Drawing of the homestead as it may have appeared in the 1840s, view is looking generally south. ("Fireplace Tiles 52-53," Catalogue #s 9658-9678, Indiana Dunes Museum Collection, Indiana Dunes National Lakeshore)

A FIREPLACE TILES

Tile 58



Appendix A. “Fireplace Tiles,” Set of glazed pictorial ceramic tiles, ca. 1900. The set includes a typescript of descriptions by Margaret Larson, who donated them to the park in 1993.
(Bailly Homestead, Catalogue #s 9658-9678. Indiana Dunes Museum Collection, Indiana Dunes National Lakeshore.)

See end of this document for accession notes and information about the tile makers.

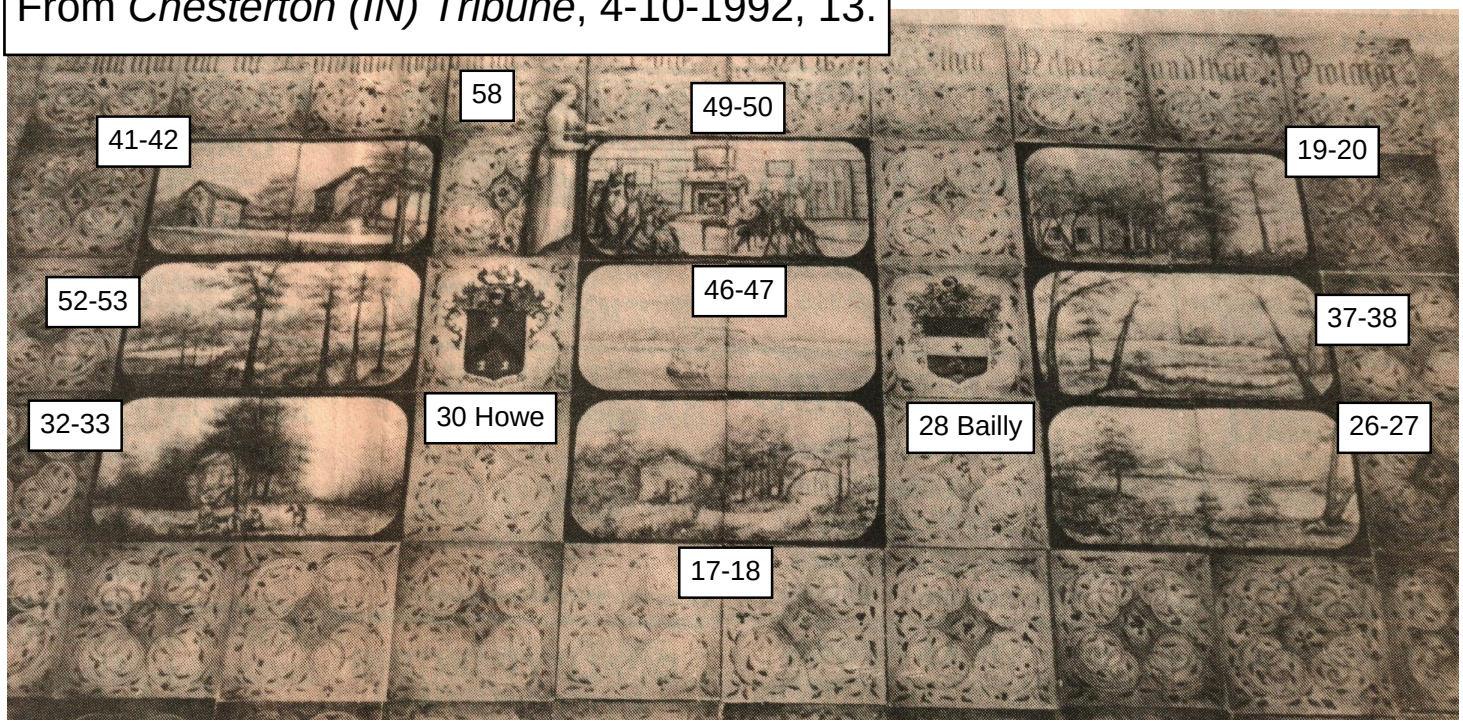
Description from Margaret Larson and INDU accession files.

TILES 48 AND 58

FRANCES R. HOWE, LAST RESIDENT OF THE HOMESTEAD AT AGE 30 TO 40.

TILE LAYOUT KEY

From *Chesterton (IN) Tribune*, 4-10-1992, 13.



Appendix A



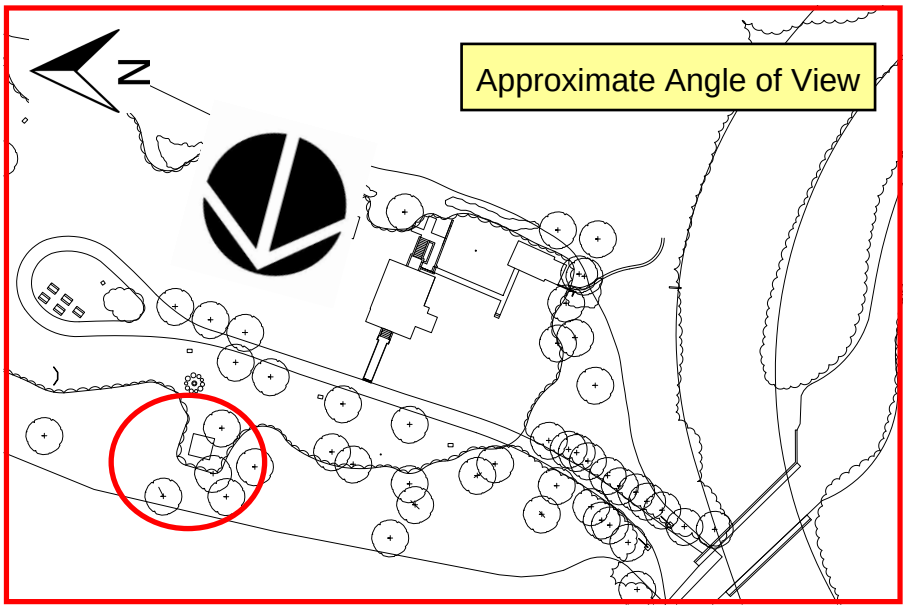
Description from Margaret Larson and INDU accession files.

Tiles 17-18

TILES 17 AND 18

POTAWATOMI CAMPING NEAR THE HOMESTEAD.

This is the storehouse (HS-21) as it appeared before a remodeling project that took place in the late 1890s or early 1900s.



Appendix A



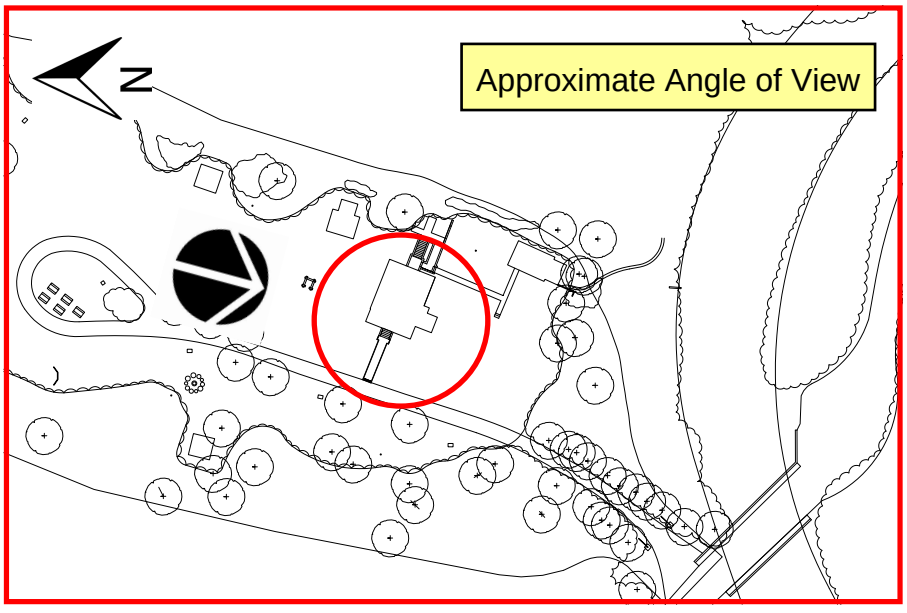
Description from Margaret Larson and INDU accession files.

Tiles 19-20

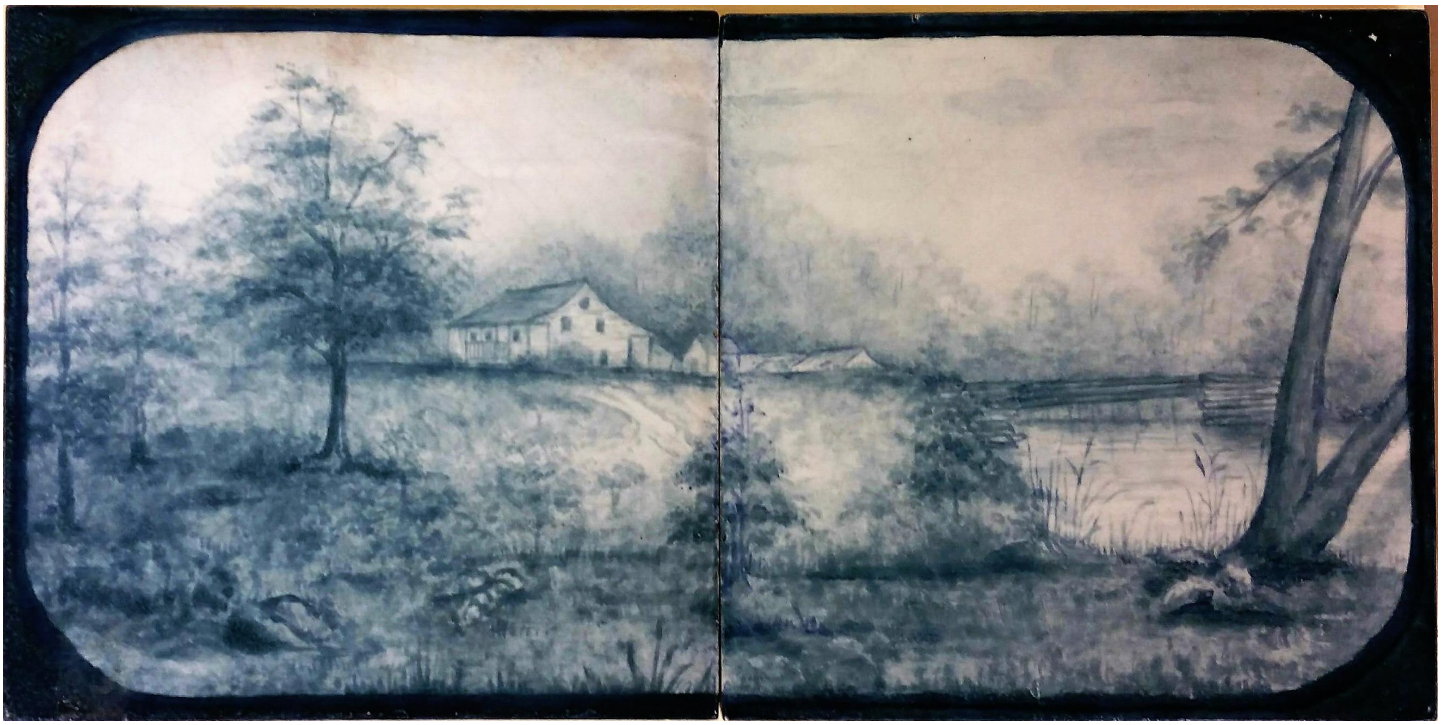
TILES 19 AND 20

THE PRESENT BIG HOUSE AS JOSEPH BAILEY BUILT IT. NOTE IT HAD NO FOUNDATION.

Notes:
This matches numbered photo #6.



Appendix A

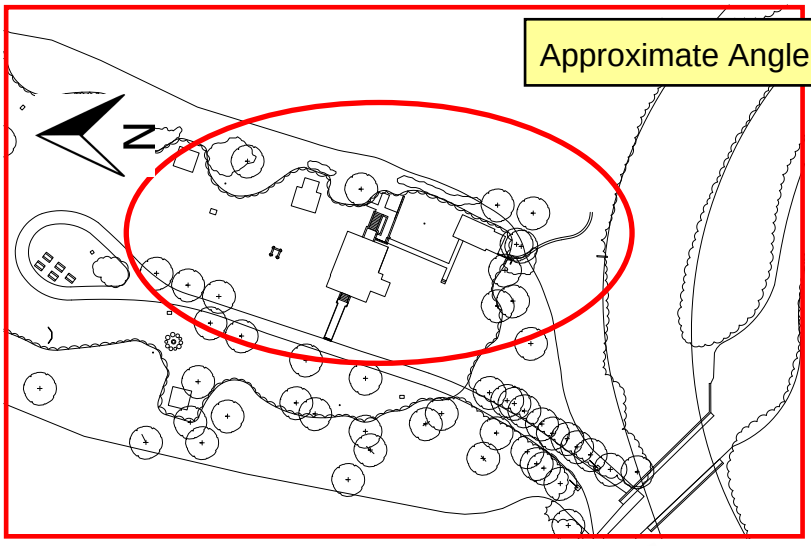


Description from Margaret Larson and INDU accession files.

Tiles 26-27

TILES 26 AND 27

THE MARRIAGE TREE TAKEN FROM THE DRIVE LEADING UP TO THE BAILEY FRENCH HOUSE. AN OAK SAPLING AND AN ELM SAPLING WERE PLANTED BY ROSE VICTORIA BAILEY AND HER BRIDEGROOM FRANCIS HOWE ON THEIR WEDDING DAY NOV. 14, 1841. THE SAPLINGS GREW TOGETHER AND FORMED ONE TREE.
STRUCK BY LIGHTNING ABOUT 1940.



Appendix A



Description from Margaret Larson and INDU accession files.

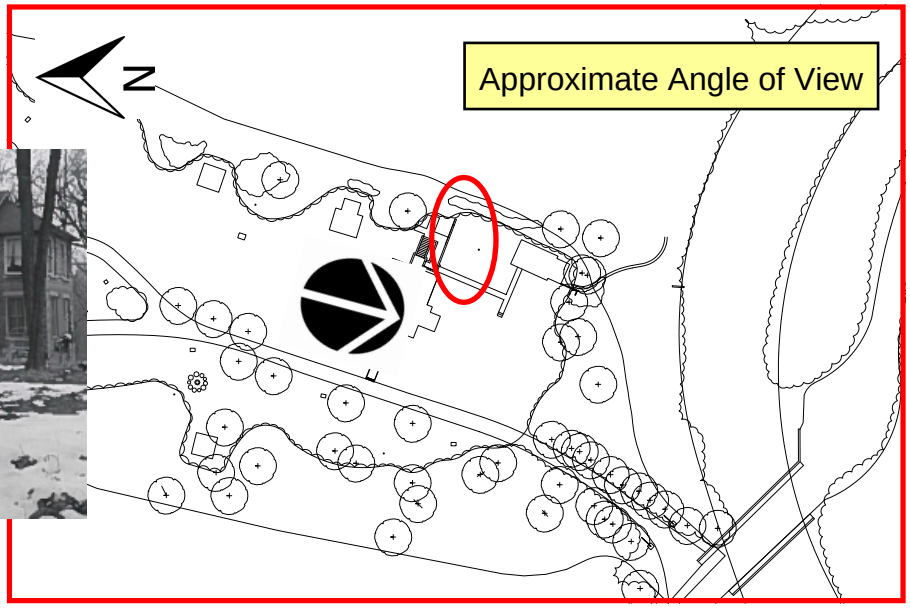
Tiles 32-33

TILES 32 AND 33

JOSEPH BAILEY'S FUR TRADING OFFICE
NOTE INDIANS RESTING AFTER BRINGING THE SKINS.

Notes: This building later served as a laundry building. It was still there in 1958. Photo below by James Sullivan, NPS 1958.





Appendix A



Description from Margaret Larson and INDU accession files.

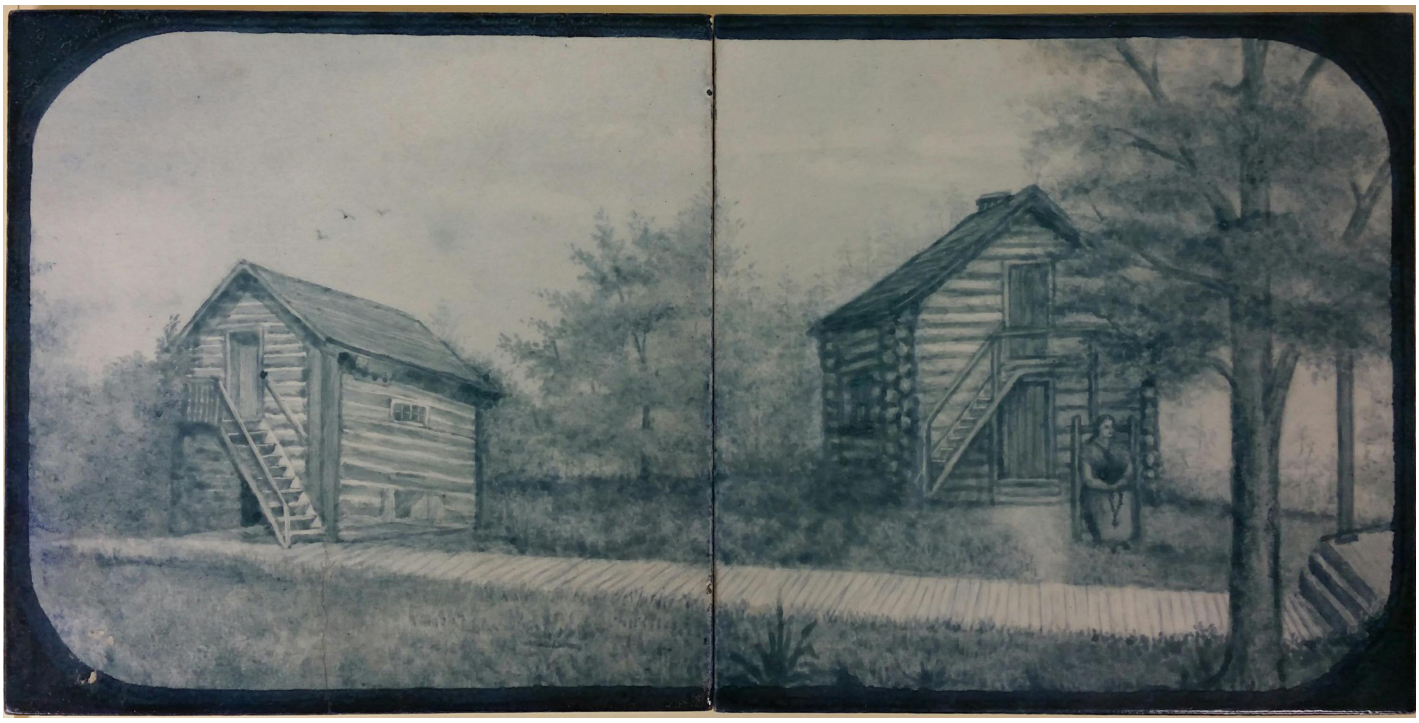
Tiles 37-38

TILES 37 AND 38

BAILEY FARM LOCATED NORTH AND EAST OF THE BIG HOUSE. FIRST CULTIVATED BY MR. ALFRED JOHNSON AND LATER BY MR. CHARLIE JOHNSON, BROTHER IN LAW, 1880 TO 1906 WHEN THE FARM HOUSE WAS MOVED NORTH ON HOWE ROAD. NOW A LAND MARK.

Notes:
Not the Bailly Homestead.

Appendix A



Description from Margaret Larson and INDU accession files.

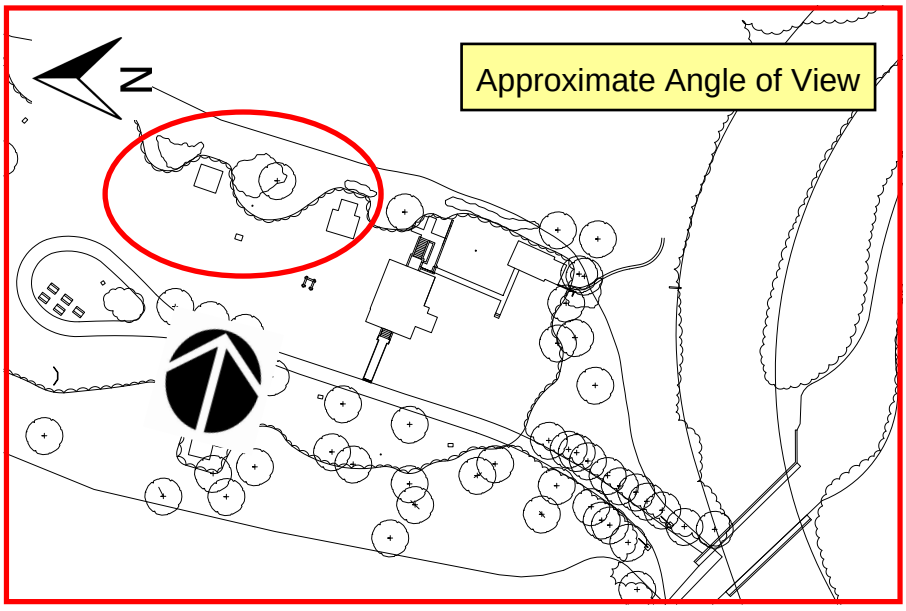
Tiles 41-42

TILES 41 AND 42

EARLY MARIE AND JOSEPH BAILEY HOUSE AND STORE HOUSE.

Notes: The building to the right was replaced with the Chapel around 1869. The woman in the chair is likely Marie Bailly, who lived in this building for a time before her death in 1866.

The building on the left is visible in historic photo number 13.



Appendix A



Description from Margaret Larson and INDU accession files.

Tiles 46-47

TILES 46 AND 47

A BOAT BRINGING THE FAMILY FROM MACKINAC TO THE NORTHWEST.

Notes: This is not part of the Homestead

Appendix A



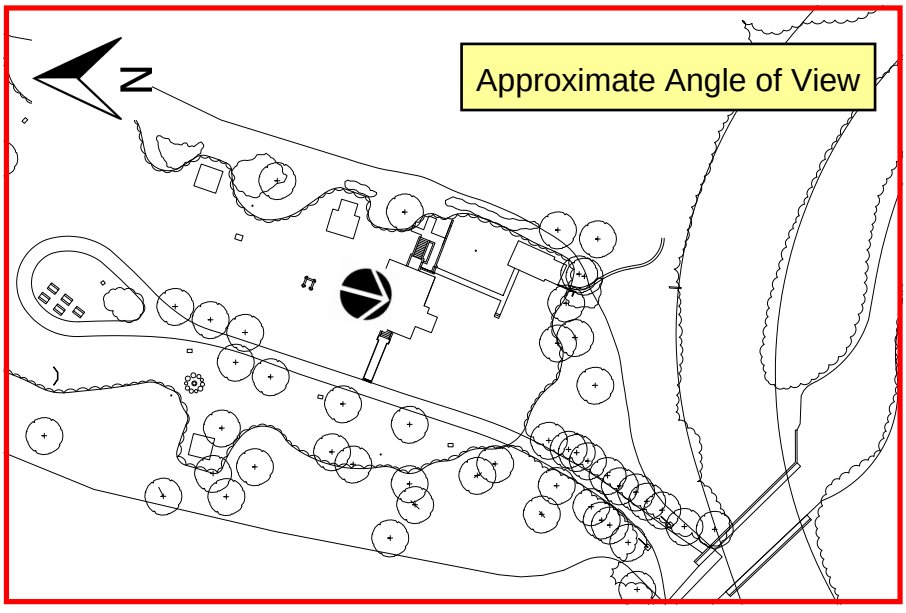
Description from Margaret Larson and INDU accession files.

Tiles 49-50

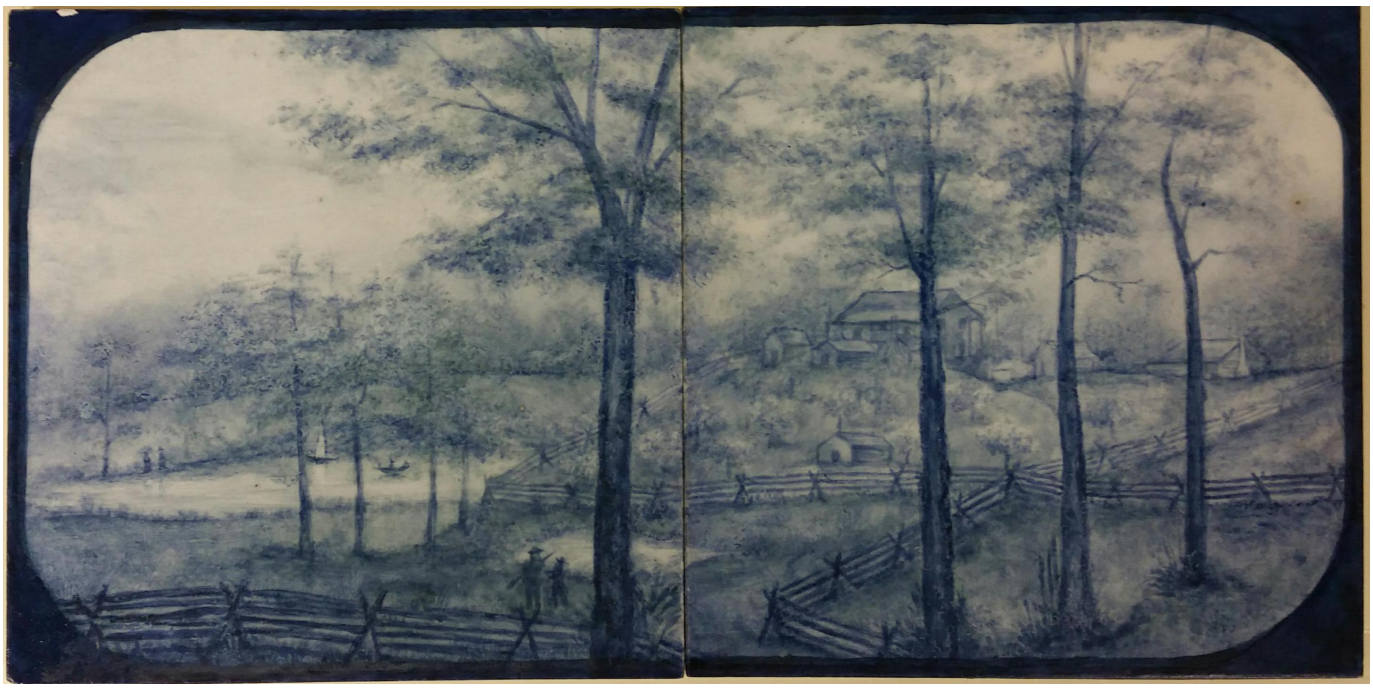
TILES 49 AND 50

JOSEPH BAILEY IN HIS LIVING ROOM READING THE BIBLE TO A GROUP OF OTTAWA NEIGHBORS. HE LATER TRANSLATED THE BIBLE INTO THE OTTAWA LANGUAGE.

This may be set in a different house on the property, since they did not start building the house until 1834, at which time he was already ill. He died in 1835. This could be a depiction of the since demolished “Dower House” which was described in Pfanz and Jones, Bailly Homestead Historic Structure Report, Historical and Architectural Data,1972, 28.



Appendix A



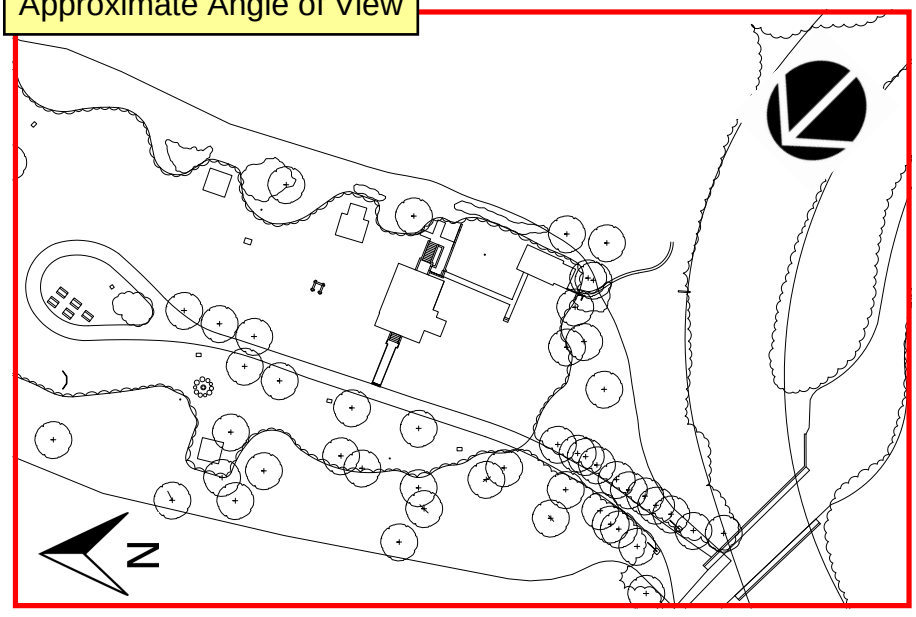
Description from Margaret Larson and INDU accession files.

Tiles 52-53

TILES 52 AND 53

THE BAILEY HOUSE FARM TAKEN FROM SOUTH AND EAST MEADOW. LATER BUILDINGS WERE MOVED AND ORCHARD PLANTED. THE FARM HOUSE WAS LOCATED ON WHAT IS THE TRAIL FROM HOMESTEAD TO CHELBERG FARM. IT WAS NOT THE CHELBERG FARM.

Approximate Angle of View



Appendix A

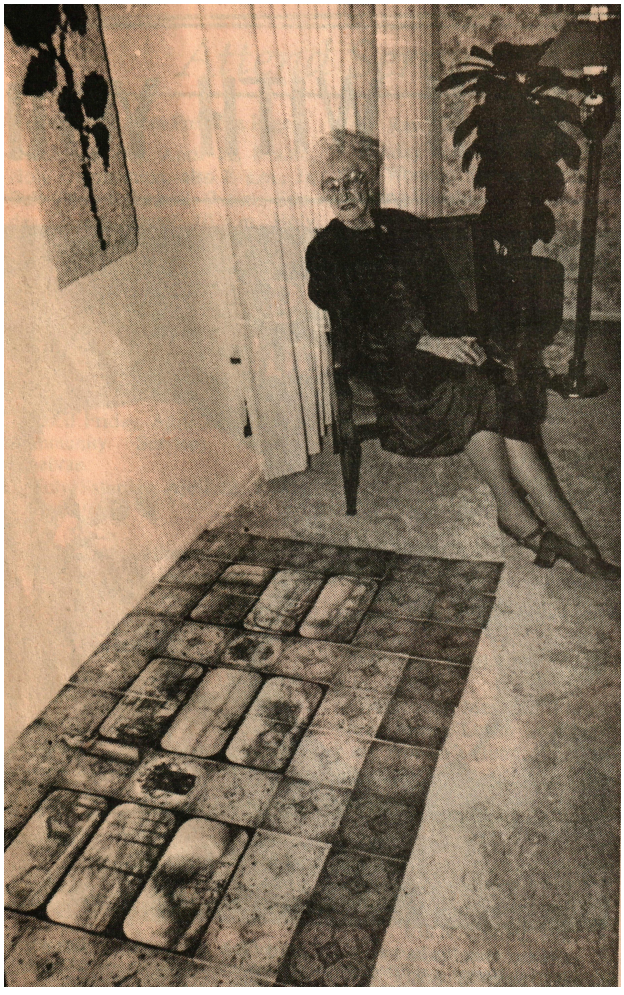
Tiles 29 and 30



Tile 29. Bailly Coat of Arms



Tile 30. Howe Coat of Arms



1993 Photograph of Margaret Larson, with the tiles laid out in her living room.

From:
Margaret Willis, "Preserved *for decades: Bailly tiles have a story to tell." Chesterton (Indiana) Tribune*. April 10, 1993, 13.

Typescript from Margaret Larson and INDU accession files.

Appendix A

FRANCES HOWE HAD THESE TILES MADE ABOUT 1900 OR SHORTLY BEFORE. WHEN SHE RENOVATED THE "BIG HOUSE" REPAIRS AND RENOVATIONS WERE NUMEROUS. PARQUETTE FLOORS AND WAINSCOTING, FURNACE HEAT, FOUNDATION, A BASEMENT KITCHEN, OFFICE AND STORAGE ROOMS ON LOWER LEVEL, A WINDMILL AND WATER. LATER LOVELY RUGS AND ART (PAINTINGS) AND FINE FURNITURE WERE ADDED.

ACCORDING TO MY MOTHER, MRS. P.G. LARSON, MISS HOWE PLANNED TO HAVE THE TILES INSTALLED OVER THE FIREPLACE IN THE LIVING ROOM. WHY IT WAS NOT DONE, ONE DOES NOT KNOW.

AFTER MISS HOWE'S PASSING, IN LOS ANGELES IN JAN. 1917, HER FOSTER DAUGHTER, MRS. EMMA HOUSTON ACCOMPANIED THE REMAINS BACK TO INDIANA TO ARRANGE THE FUNERAL AND TO TAKE CARE OF FINANCIAL MATTERS AND HER INHERITANCE. A HURRIED PUBLIC AUCTION HAD ALREADY BEEN ARRANGED BY THE ADMINISTRATOR, MR. APGAR. MRS HOUSTON WAS A DEAR FRIEND OF MY MOTHER AND LIVED WITH OUR FAMILY, DURING THE YEAR SHE SPENT IN INDIANA AND CHICAGO BEFORE RETURNING TO LOS ANGELES.

THESE TILES WERE AMONG SOME TREASURES MRS. HOUSTON RESCUED BEFORE THE AUCTION SUCH AS JEWELRY, PICTURES, BOOKS ETC. SHE LEFT THE TILES WITH MOTHER SAYING SHE WOULD SEND FOR THEM LATER.

AFTER SEVERAL YEARS, MOTHER HAD CORRESPONDENCE TELLING OF A DIVORCE, LOSS OF MONEY AND ILL HEALTH. NO MENTION OF THE TILES. THIS DATES BACK TO 1919.

AFTER MY MOTHER'S PASSING, IN 1947, I HAVE KEPT THE TILES, MOVING THEM AS I HAVE MOVED.

REALIZING MY ADVANCED AGE AND THE HISTORICAL VALUE OF THE TILES, I AM GIVING THEM BACK TO THE HOMESTEAD AND THE NATIONAL LAKESHORE.

I HOPE THEY CAN BE DISPLAYED WHERE VISITORS CAN ENJOY THEM AND LEARN ABOUT ANOTHER MEDIA OF ART.

Appendix A

DESCRIPTION OF THE TILES

THERE ARE SIXTY (PLUS FOUR) CERAMIC GLAZED TILE IN VARYING SHADES OF BLUE. MANY HAVE DESIGNS OF WILD CHERRY LEAVES AND FRUIT. THE TOP ROW OF TEN TILES DEPICT THE HOLY SCRIPTURE VERSE: "THEY THAT FEAR THE LORD AND HAVE HOPE IN THE LORD, HE IS THEIR HELPER AND PROTECTOR."

EIGHTEEN (18) TILE IN SETS OF MATCHED ARRANGEMENT, DEPICT PICTURES OF THE EARLY YEARS OF THE HOMESTEAD.

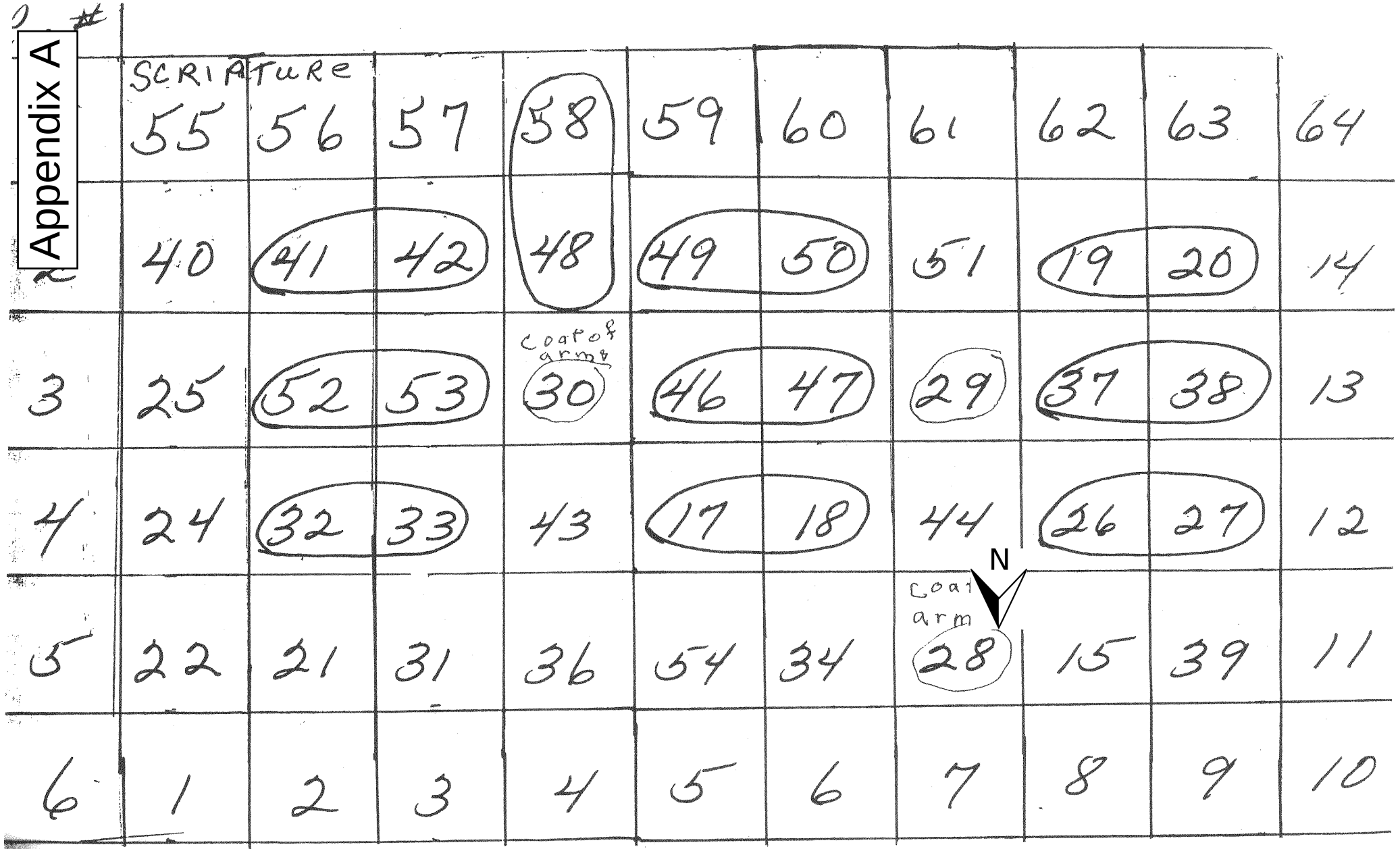
SINCE I SEEM TO HAVE BECOME THE "KEEPER" OF THESE TILES, AFTER MY MOTHER'S DEATH, I WISH TO GIVE THEM BACK TO THE HOMESTEAD AND THE NATIONAL LAKE SHORE PROPERTIES. THEY ARE MEANINGLESS ANYWHERE ELSE. BUT I DO FEEL THEY SHOULD BE DISPLAYED IN SOME FASHION SO THAT VISITORS MIGHT ENJOY THEM.

Margaret A. Larson

Appendix A

	DESCRIPTIVE TILE
TILES 41 AND 42	EARLY MARIE AND JOSEPH BAILEY HOUSE AND STORE HOUSE.
TILES 52 AND 53	THE BAILEY HOUSE FARM TAKEN FROM SOUTH AND EAST MEADOW. LATER BUILDINGS WERE MOVED AND ORCHARD PLANTED. THE FARM HOUSE WAS LOCATED ON WHAT IS THE TRAIL FROM HOMESTEAD TO CHELBERG FARM. IT WAS NOT THE CHELBERG FARM.
TILES 32 AND 33	JOSEPH BAILEY'S FUR TRADING OFFICE NOTE INDIANS RESTING AFTER BRINGING THE SKINS.
TILES 48 AND 58	FRANCES R. HOWE, LAST RESIDENT OF THE HOMESTEAD AT AGE 30 TO 40.
TILES 49 AND 50	JOSEPH BAILEY IN HIS LIVING ROOM READING THE BIBLE TO A GROUP OF OTTAWA NEIGHBORS, HE LATER TRANSLATED THE BIBLE INTO THE OTTAWA LANGUAGE.
TILES 46 AND 47	A BOAT BRINGING THE FAMILY FROM MACKINAC TO THE NORTHWEST.
TILES 17 AND 18	POTAWATOMI CAMPING NEAR THE HOMESTEAD.
TILE 29	BAILEY COAT OF ARMS.
TILE 30	HOWE COAT OF ARMS.
TILES 19 AND 20	THE PRESENT BIG HOUSE AS JOSEPH BAILEY BUILT IT. NOTE IT HAD NO FOUNDATION.
TILES 37 AND 38	BAILEY FARM LOCATED NORTH AND EAST OF THE BIG HOUSE. FIRST CULTIVATED BY MR. ALFRED JOHNSON AND LATER BY MR. CHARLIE JOHNSON, BROTHER IN LAW, 1880 TO 1906 WHEN THE FARM HOUSE WAS MOVED NORTH ON HOWE ROAD. NOW A LAND MARK.
TILES 26 AND 27	THE MARRIAGE TREE TAKEN FROM THE DRIVE LEADING UP TO THE BAILEY FRENCH HOUSE. AN OAK SAPLING AND AN ELM SAPLING WERE PLANTED BY ROSE VICTORIA BAILEY AND HER BRIDEGROOM FRANCIS HOWE ON THEIR WEDDING DAY NOV. 14, 1841. THE SAPLINGS GREW TOGETHER AND FORMED ONE TREE. STRUCK BY LIGHTNING ABOUT 1940.

Appendix A



NOTE: PICTURES CIRCLED DESCRIPTION ON SEPARATE SHEET

Appendix A

	ey who fear the Lord have Hope in the Lord									
	e is their help and Protector								↓	
	55	56	57	58	59	60	61	62	63	64
				9 figure						
2	40	41	42	48	49	50	51	19	20	14
				Miss How						
3	25	52	53	30	46	47	29	37	38	13
				coat of arms						
4	24	32	33	43	17	18	44	26	27	12
5	22	21	31	36	54	34	28	15	39	11
6	1	2	3	4	5	6	7	8	9	10

N

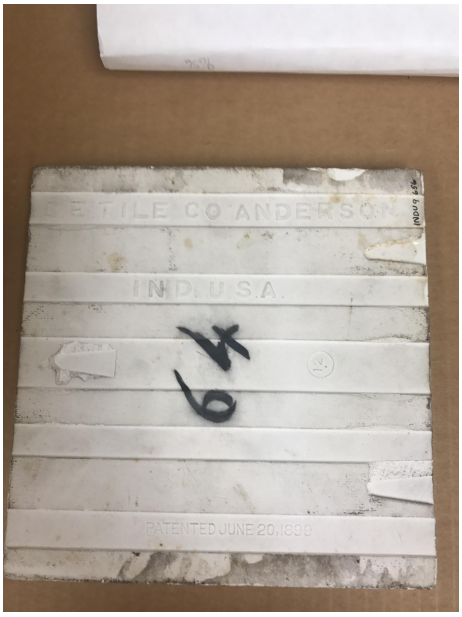
Pictures 2 tile

description of picture tile on separate sheet

over

Newspapers.com
Anderson Daily Bulletin (Anderson, Indiana) · Mon, Aug 1, 1960 · Page 23
Downloaded on Aug 18, 2017

Appendix A



Back of image tiles. Field tiles have a different maker.

On back of custom tiles:
“C. E. Tile Company, Anderson IND, USA.
Patented June 20, 1899”

On field tiles:
Different pattern
"GRIP BACK"



Tile Factory Started Here Around 1900

Ceramic tile, a favorite of architects and builders from the early days of civilization, is the product of one of Anderson's oldest flourishing industries.

Many millions of tiles bearing the inscription "National Lifetime Tile, made in Anderson, Indiana, U.S.A." have been installed in buildings in almost every country of the world in the past 71 years.

Established in 1889 on its present 27-acre site on E. 26th St. by three energetic Anderson citizens—B. O. Haugh, Geroge Lilly and Sam Hughes—the plant was first formed as the Columbia Encaustic Tiling Co.

In 1891 a tile floor installed in the east portion of the White House was designed and made at the local plant, an indication of the regard in which the local industry was held.

Incorporated under Indiana laws as the National Tile Co. in 1903 they continued to expand and in the succeeding years pioneered many of the refinements that have gone into today's high quality wall and floor tile.

In 1945, the name was changed to the National Tile and Manufacturing Co. and the company turned from vital war production to civilian tile manufacturing again.

The company, oldest manufacturer of ceramic wall and floor tile in the country, is also one of the largest. And with other Anderson industries it stands ready for the expected economic expansion of the "Super Sixties" which will see an increased demand for tile products in business and home building.



Notes on the manufacturers of the tile set.

The tiles appear to have been made by the Columbia **Encaustic Tiling Company,** of Anderson Indiana.

The company was established in 1889 and remained in operation into the 1960s, but it changed names in 1903, which means the Bailly tiles were made between 1889 and 1903. It is likely they were manufactured about the time Frances Howe was remodeling the main house, between 1896 and 1903. They have been assigned a construction date of ca. 1900.

It is possible that drawings made by Rose Howe were used for some of the scenes depicted on the tiles. The drawing to the left, by Frances Howe's sister, Rose Howe, exhibits a similar style.



Chapel belfry, photo taken before the Chapel was moved north. (INDU Museum Collection)

B HISTORIC NUMBERED PHOTO SET

Appendix B. Historic Numbered Photo Set, from INDU Museum Collection and the Porter County Historical Society. (Note. #s 8,14, 15, and 17 are missing.) The photos were taken ca. 1890. They predate the new foundation on the house, which was started in 1896, and at least one was taken before the death of Rose Bailly Howe in 1891.

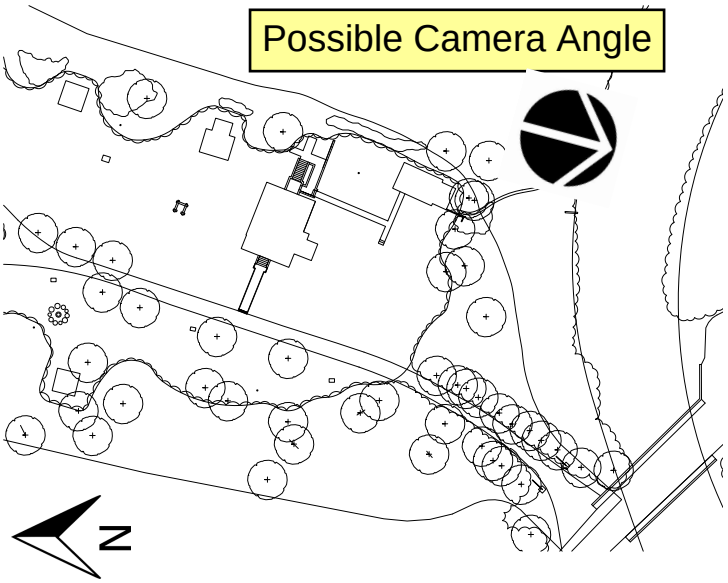
#1



Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No 1

On the other side of the river as the road approaches the house it winds down a hill and comes close to the river. Just at the foot of this hill there is a view of a pretty landscape with the river for a foreground. The wooded meadow making the principal part of the landscape is part lies east of our house and in part of the property. Note the roots of the trees laid bare by the action of water during freshets.



#2

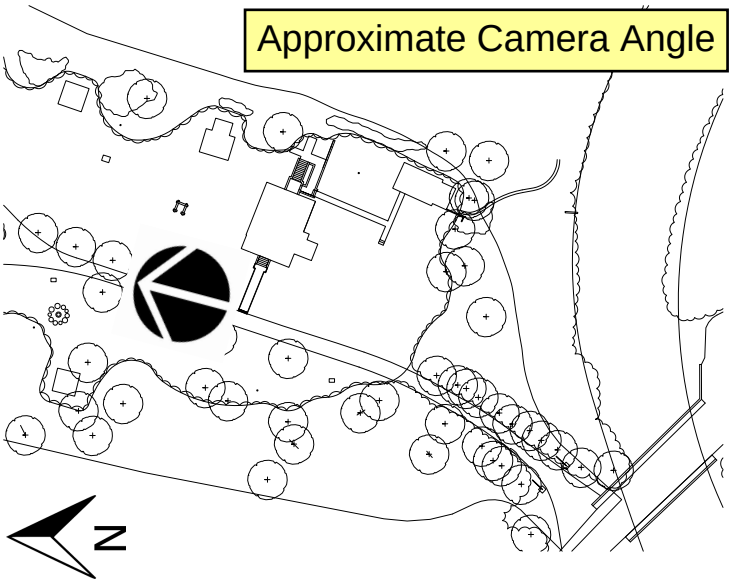


NOTES: These trees are shown in tiles 17-18.

Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 2

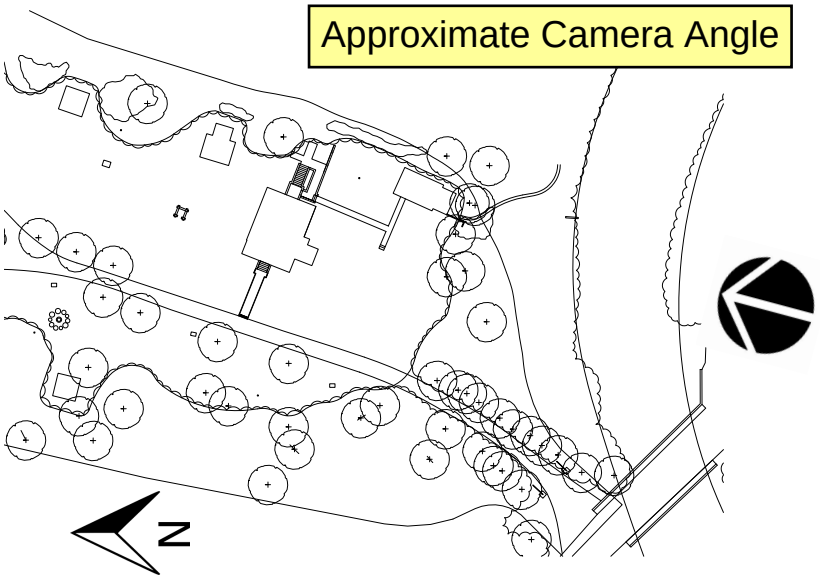
View on the left side of the road directly opposite the landscape depicted in No. 1. The road lies between the two. The willows were bent by a storm and have remained in that position until they have permanently grown as you see them, a very pretty landscape, but it does not belong to us, as it lies south of the river, and we have our property all on the north side



#3



Approximate Camera Angle



Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 3

Still on the south side of the river a little nearer the house, taken from the road. The boat used to lie where you see the bank bare on the north side The hill slope is our orchard, and you can see one of our chimneys peering above the trees. I like the reflection in the water

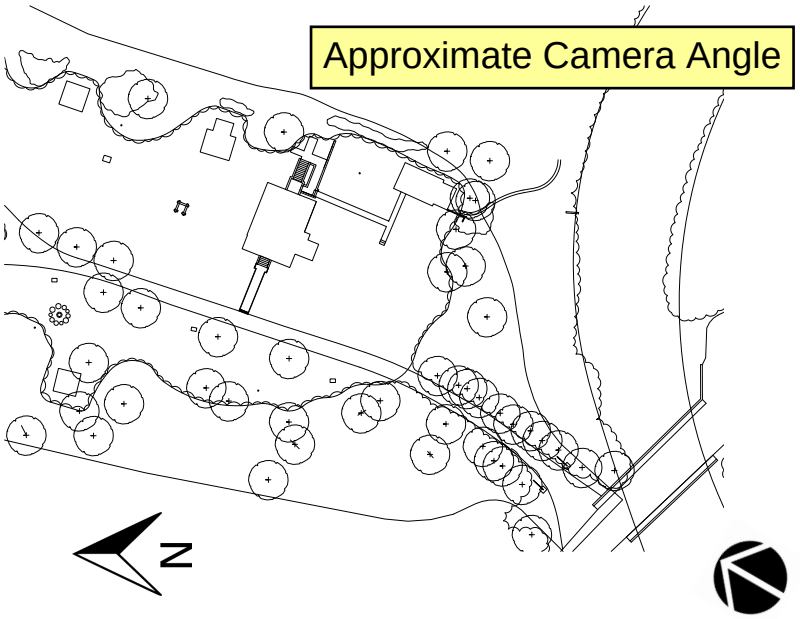
#4



Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 4

View of the bridge from the south side This is the least accurate of all the views as they had been ~~marking~~ the bridge recently, and so much waste material together with [rocks] and derricks had been left lying around that no satisfactory view could be obtained. The hill is much higher in reality, and the house stands a little back from the brow and at this season hidden by the foliage



#5

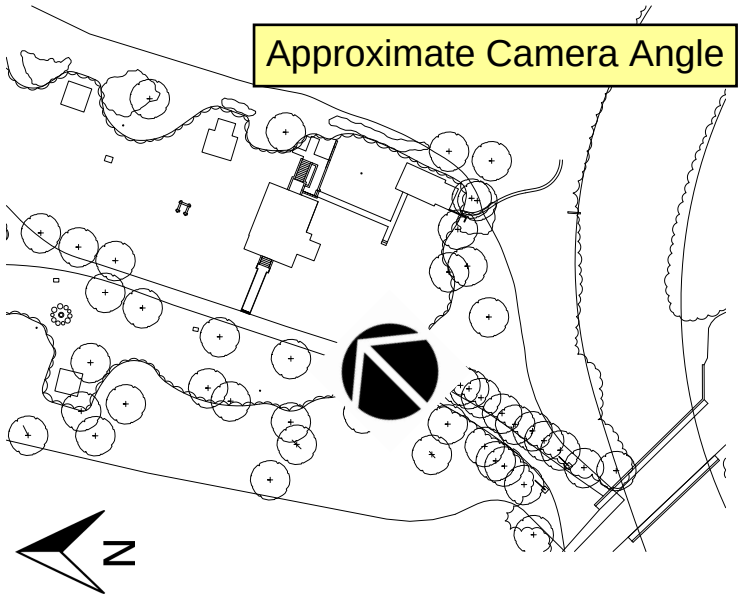


NOTES: Taken before the porch roof was changed, but after the dormers were added.

Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 5

Southwest corner of the house which fronts west, or to be more accurate a little more to northwest than due west. Grapevine hides the south end of front porch Windows in the gable end in the second story belong to Mother's room She spends her time by the one you see the most of. In the highest story the window best seen in the gable end belongs to my room. The dormer windows were put in the roof last October. The dining room is on the ground floor of this south west corner. A little fenced in flower garden is in the foreground



#6

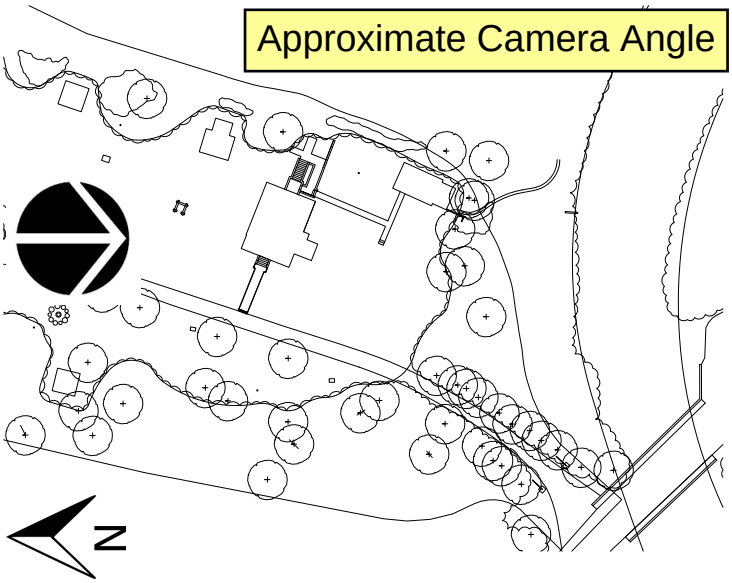


NOTES: This photo was probably the model for tiles 19-20.

Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 6

Northwest end of the house with north view of thefront porch. You see the length of the porch and how high it is, you can also see the balcony railing in the second story just above the front door. Windows in the ground floor belong to the part or In the second story the window over the porch and the window just around the corner belong to Rose's room. The ladder was to pick cherries. By it you see the back steps and the kitchen together with a little corner of the chapel.



#7



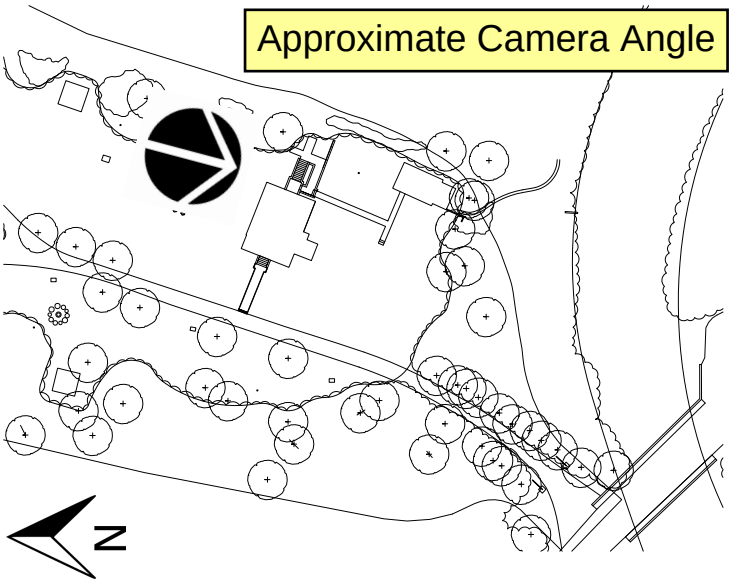
NOTES: This is Amanda Gustafson, who probably married Alfred Johnson, a caretaker.

Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 7
The back porch from the north end looking south. The brick building is the kitchen. the porch is used to dry clothes, and as an appendage to the kitchen. You see the little balcony just like the one over the front porch and under it stands Amanda [monarch] of all she surveys. That part of the porch outside of the pillars on the left of the picture has been added since our return from Europe [likwise] the brick house. On each side of the kitchen [door] are niches for St. Joseph and the B. Virgin In the gable there is a crucifix. The steps lead down to the pavement in front of the chapel which faces the same way as the kitchen.

Print is H.
Print of te

Approximate Camera Angle



#9

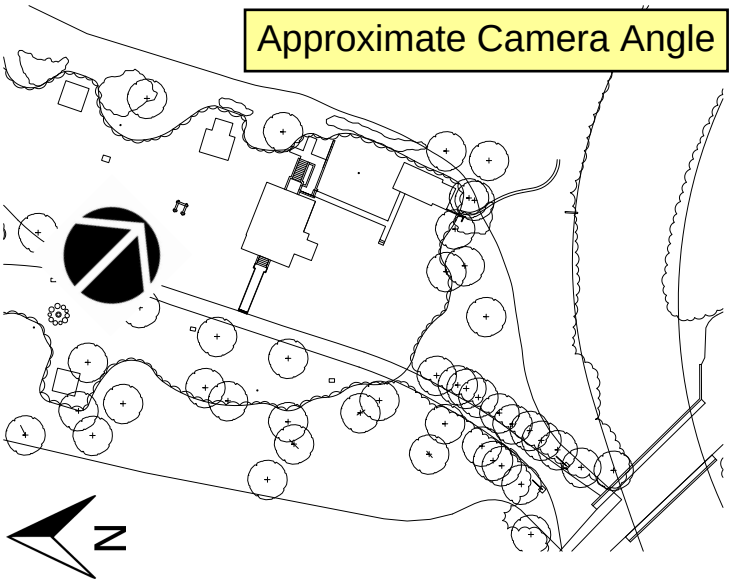


NOTES: This is probably Francis Howe (left) and Virgnia (Jennie) Wicker, her niece.

Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 9

Front viewof the chapel in which the belfry does not appear. A side walk is in the foreground. Virginia looks almost devout, but in spite of her serious expression, she is responsible for my amusement as she uttered a most absurd remark just under her breath and in a way to avoid a mark of breach of silence. The boxes and sticks are for morning gloriesand the vine in the gable is a Virginia Creeper. The steps lead up to the back porch.



#10



This was taken before the apse was added.

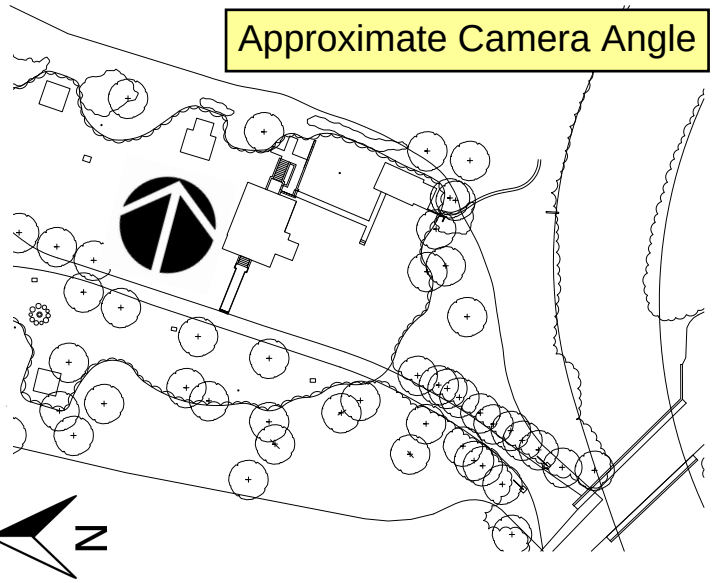
Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 10

Chapel interior, taken from outdoors
The lamp hanging from the ceiling
hides the altar piece. Great [pain] was
taken to make this as good as possible
Use the magnifying glass and the
pictures will be discernible Under St. Joseph
hangs Rose's ornamental pages (?) of fine
penmanship Some of the words can be
deciphered. The crucifix on the tabernacle
is from Old (?) Ammergau. You will see
one of the stations of the Way of the Cross
You will see the cross on its frame

(The writing under the seal has been erased.)

Approximate Camera Angle

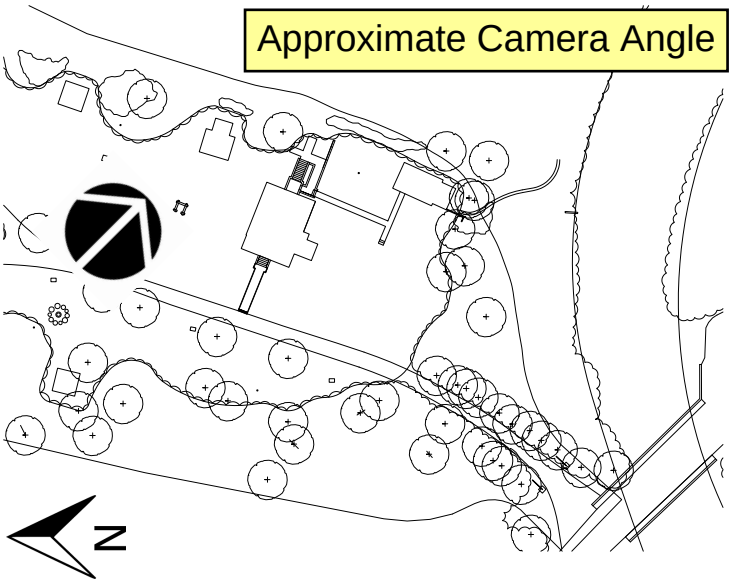


#11



Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 11 Chapel exterior showing the belfry, and also the relative positions of the chapel and house. Take No. 7 view of the back porch, and you will recognize that the steps in this view xxxx are those of the back porch. Compare this view of the chapel with No. 6 view of N.W. end of the house and you will understand how the chapel stands with regard to the house.



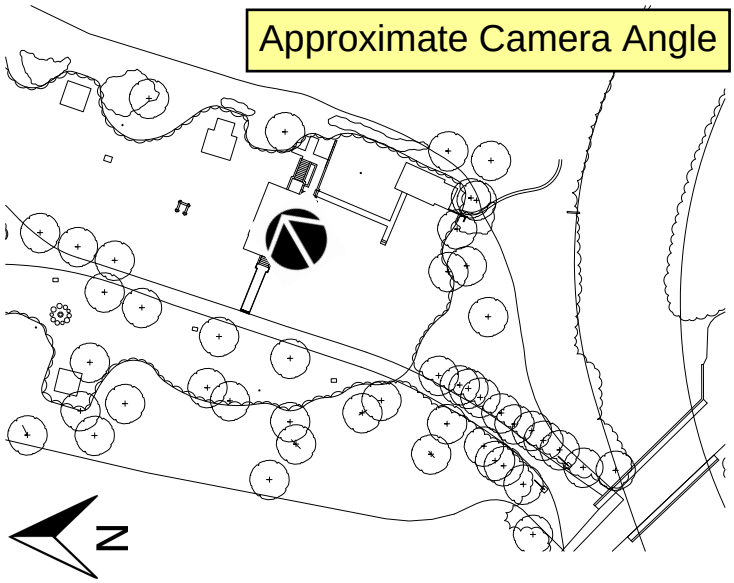
#12



NOTES: This was taken before the Chapel was moved north.

Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 12
Chapel belfry taken from a dormer window on the east side of the house You see the chapel roof, also the roof of this house as part of a foreground. You will see pieces of scanlling on our roof, left by carpenters and painters, having been used as a sort of scaffolding. To the left through trees a glimpse of another log building



#13



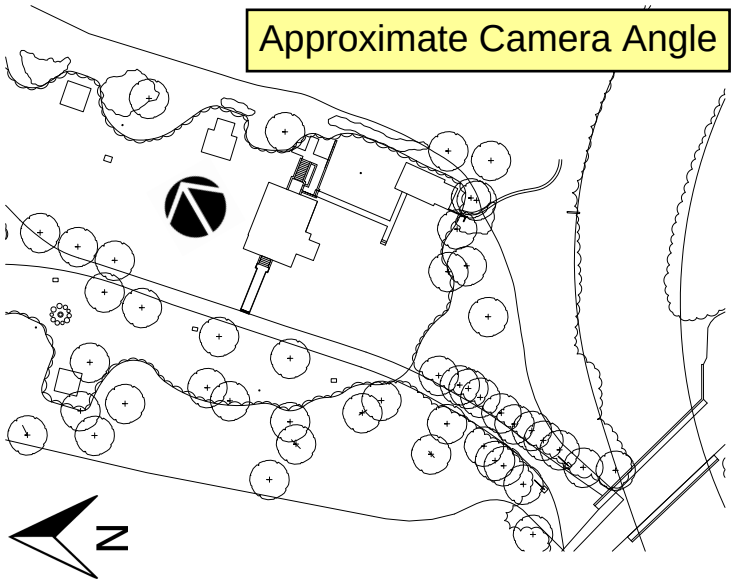
NOTES: This building is no longer standing; it is depicted in the ca. 1900 tiles as well, see tile#s 41-42.

Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 13 Old log building renovated one of the old warehouses required for the purposes of the fur trade Grandfather was an agent for the American Fur Company and had these buildings outside of the dwelling house for purposes of storage. Now this is used by the men to store their tools and repairing material This is the building of which you have a partial glimpse through trees in the previous photograph the side walk is the same as that in front of the chapel

Second house from right side of the picture

left of chapel



#16



NOTES: This building was reconstructed a few years after this photo was taken, sometime before 1907. It is now HS-21.

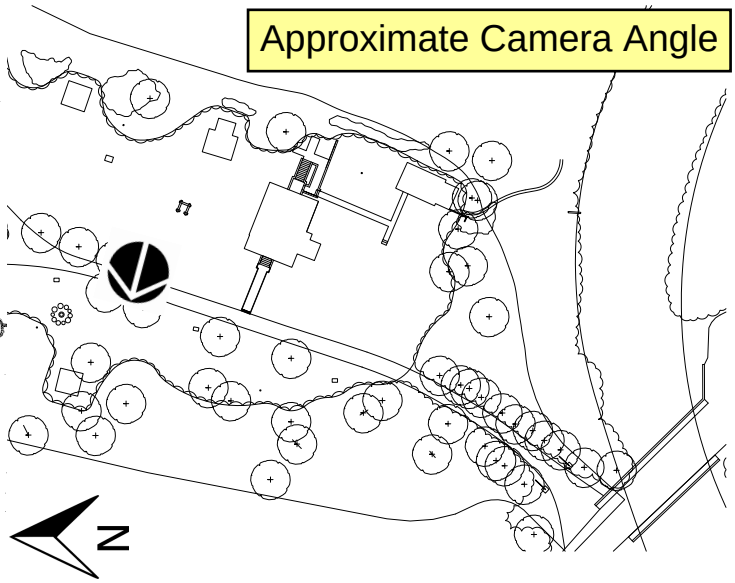
Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 16 Another old warehouse which
we now use as a chicken house there
is a hen standing in the doorway.
This building is at a little distance from
the house west of the front porch.
Separated from the rest of the
immediate premisesby a grass (plat = plot?)
several yards wide. Behind this house
there is awell wooded ravine

(in pencil) or entryway facility
Forest at east side { convenience (?) / common use (?) / commune (?) } Formerly used for { of Ind. / now } here

A lady opening door
Indiate tree(?) (this?) as three (thrice?)
tents off to right in Distance

Approximate Camera Angle



#18



NOTES: This might be looking west instead. The description of trees and river do not match a view to the east.

Description from handwritten notes on back transcribed in INDU accession files. The notes appear to have been written by Francis Howe.

No. 18

View from the farmhouse window[s]
This picture was taken from the dormer window and is a view of the meadow lying at the foot of the hill east of us. The distant trees are on the river bank. Those on the left are the same trees whose roots are shown laid bare by the [freshets], in the first photograph of this set.

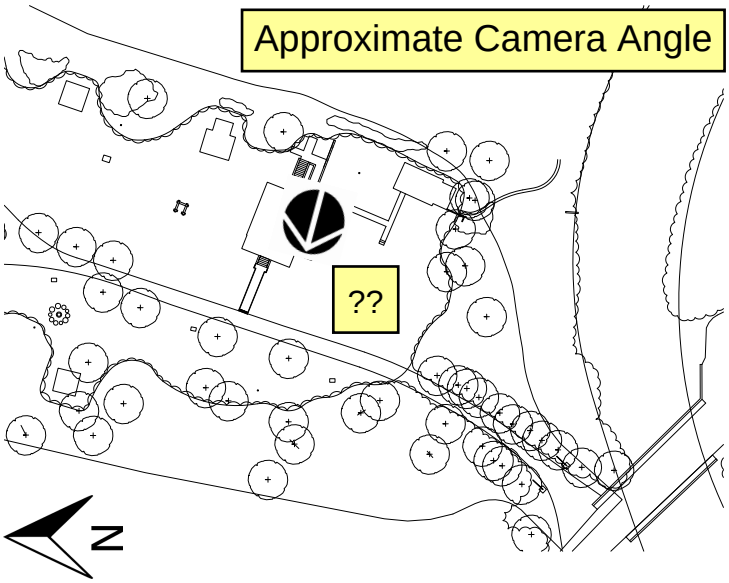
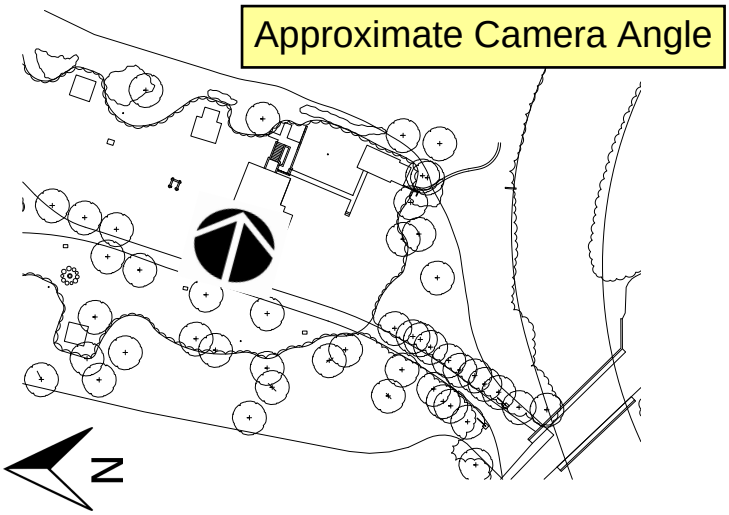




Photo of Rose Bailly Howe, Frances Howe, and Jennie Wicker, on the west porch of the house (HS-18) ca. 1890. This print appears to be contemporary to the Historic Numbered Photo Set, but it does not have the same type of numbering or handwritten notes on the back. Note that this photograph was taken prior to the house being raised. The porch floor appears to be in poor condition. Also the porch floor appears to be nearly level with the interior floor. The photo also shows that there was a center hall with a flush wood floor all the way through the house. Through the hall you can see a niche for a statue of Mary, as well as the door into the brick house.

The back of one early copy of this photo has a handwritten note that reads: "BAILLY HOMESTEAD From left to right: Rose Bailly Howe, her daughter Frances Howe, and her niece Jenny Wicker." The note was probably written by Frances Howe; the handwriting matches that on the back of the numbered photos.





ca. 1976 photograph of the Main House under rehabilitation. (INDU Museum Collection)

C CHRONOLOGY OF KNOWN ALTERATIONS

Appendix C.
Pages from the 1977 NPS Created Preservation Guide, Section 6: "Chronology of Known Alterations."

Walter, Douglas S. *Historic Structures Preservation Guide Bailly Homestead.* (U.S. Department of the Interior, National Park Service, Indiana Dunes National Lakeshore, 1977) Section 6, 1-6.

HISTORIC STRUCTURES PRESERVATION GUIDE

BAILLY HOMESTEAD — INDIANA DUNES NATIONAL LAKESHORE

ARCHITECTURAL CHRONOLOGY — CONSTRUCTION LOG

DATE	DESCRIPTION OF WORK — CONTRACTOR	COST
	A CHRONOLOGY OF KNOWN ALTERATIONS TO THE BUILDINGS AND STRUCTURES OF BAILLY HOMESTEAD IS AS FOLLOWS:	
1822	Joseph Bailly establishes a fur trading post on the Little Calumet River, beside the Sauk Trail, a major Indian thorofare in northern Indiana.	
1822-24	The present Chapel building is constructed as a two-story kitchen / storehouse. Second floor is accessible by outside stair only. Large fireplace, later replaced by wood burning stove at present location of apse.	
1822-30	Storehouse constructed for exclusive use of visiting Indians	
1830's	Joseph Bailly builds tavern on Chicago-Detroit road, north of homestead proper. Site unknown.	
1832	Lemuel Bryant, who stayed overnight at Bailly's, described the homestead as a collection of little log buildings, one structure of which served as a dining house while another contained the kitchen. Two others provided sleeping quarters for the family. In addition, he noted numerous outbuildings.	
1833-34	Homestead described by traveler Charles Hoffman as having "6 or 8 log cabins of most primitive construction, all of them gray with age, and so grouped on the bank of the river as to present a picturesque appearance."	

HISTORIC STRUCTURES PRESERVATION GUIDE

BAILLY HOMESTEAD — INDIANA DUNES NATIONAL LAKESHORE

ARCHITECTURAL CHRONOLOGY — CONSTRUCTION LOG

DATE	DESCRIPTION OF WORK — CONTRACTOR	COST
1834	Joseph Bailly begins construction of 2-1/2 story, 28 ft. by 36-1/2 ft. timber house. Walls of hewn cedar and oak logs, closely fitted and pinned at corners. Sheathed with 2 inch weather boards, lapped 1 inch.	
1840's	Son-in-law Francis Howe sells timber for use of railroad nearby. Remodels house, installs kitchen in partial basement.	
1840-90	Windmill constructed over well to north of main house.	
C. 1860	Widows Bailly and Howe plaster and paper "a few" of the rooms in the main house.	
1869	Kitchen building disassembled, rotted material replaced, new brick foundation and wood sills installed. Building lowered dimensionally and outside staircase removed. Interior plastered. First floor flooring replaced with less-worn second floor flooring. Conversion to chapel by local Swedish carpenter named Johnson. Altar installed, a gift of Bishop Luers. Bell hung in front gable, from St. Mary's Academy, Terre Haute. "Later Miss Howe enclosed the bell in a belfry and decorated its walls with mementoes of their visit to Europe."	
1875-85	Brick house constructed for Rose Howe. Originally located at southeast corner of main house and connected to it by bridge to second floor porch.	
C. 1891	Extensive main house repairs, including replacement of floor, ceiling and wall material. Salvaged material used to repair and add to the chapel. Apse added, constructed of house floor joists and "whitewood from its ceiling." Chapel walls wainscoted with oak boards cut from trees on the premises.	

HISTORIC STRUCTURES PRESERVATION GUIDE

BAILLY HOMESTEAD — INDIANA DUNES NATIONAL LAKESHORE

ARCHITECTURAL CHRONOLOGY — CONSTRUCTION LOG

DATE	DESCRIPTION OF WORK — CONTRACTOR	COST
C.1900	Bailly House raised and basement built underneath.	
Before 1903	Two story log ("coachman's house") constructed using salvaged materials from Miss Howe's "grandmother's dairy house and grandfather's tool house." Other brick house alterations after this date: Front door location changed, second floor stair railing changed, bathroom added.	
1904	Brick house moved to present location, basement added.	
1908	Brick house addition constructed. Outside basement access changed to other end.	
1910	Miss Howe constructs conservatory addition to living room. Included a sink for use in caring for house plants. Dining room mantelpiece carved by Mrs. Ora Green of Chesterton.	
1919-46	School Sisters of Notre Dame of the Lake, Milwaukee, Wisconsin has title to property for use as a retreat. Gravity furnace and electricity installed.	
1946-65	Joseph S. and Alma La Roche own property. Much repair and remodeling, including floors, new concrete floor in basement and repair of concrete porch facade.	
C. 1960	Beams added to living room ceiling by contractor John Pliske.	
C.1960-1970	Fire damages northwest corner of attic and roof structure of Bailly House.	

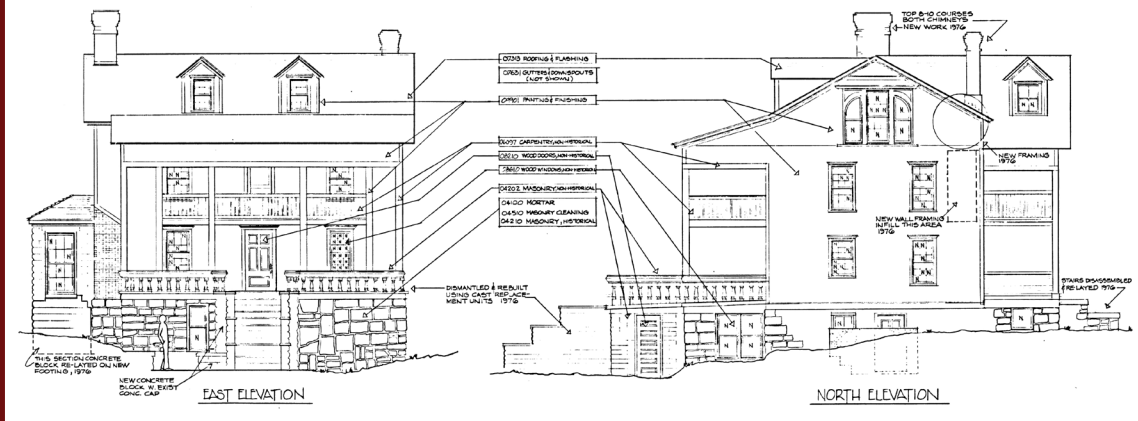
ARCHITECTURAL CHRONOLOGY — CONSTRUCTION LOG

DATE	DESCRIPTION OF WORK — CONTRACTOR	COST
1965-71	Joseph E. and Effie Rock operate main building as a restaurant. Install new heating plant, hire contractor John Pliske, add 22 x 16 kitchen addition with basement to rear of house. Rest rooms installed in basement.	
1967-69	Repairs made by Benjamin H. and Jennie Stewart, tenants. Described in a letter, transcribed verbatim: "Dear Mr. Smith: Here is the listing of the repairs we have done in the eight months' we have been here. "Brick House New lock on door Putty all windows Replaced windows Insecticide for bees Painted 4 rooms and stairs Paneled one wall Painted out side windows and porch Electrical wiring Work on septic tank New water pump New sump pump Plumming Paneled kitchen and paint Sink for kitchen Repaired burnt floor in kitchen Locks for doors Bathtub and vanity Ceramic tile in hall and panelling Tiled kitchen New pipes and fittings Ceramic in front porch New thermostate Tiled 3 floors New toilet and seat New thermostate for hot water tank Closed off third floor with panelling Replaced broken windows New trim in kitchen New door in front hall Salt for driveway that you cannot get up in the winter with out salt on hill Patched ceiling upstairs Put roofing cement on porch above hallway. This we will have to do again as ceiling still leaks Cleaned up grounds, removed dead trees cut down tree's trimmed bushe's Put florecent lights on porch."	
1972	Temporary roof, 5 squares of 90# mineral roll roofing installed to stabilize back porch. Porch enclosed with Visquine (plastic) by Pliske Construction; cost, $215.00.	$215.00

ARCHITECTURAL CHRONOLOGY — CONSTRUCTION LOG

DATE	DESCRIPTION OF WORK — CONTRACTOR	COST
1976	National Park Service restoration and reconstruction. Contract No. CX-6000-6-9004 awarded to Rainbow Construction, Geneva, Ind. Total Cost: $218,587.13. See Completion Report, "Restoration of Exterior, Bailly Homestead and Outbuildings" (Work Order No. 6300-7103-404), as-built drawings (No. 626 25000-A) and specifications (Project No. 6300-0988, September 22, 1975). Completion report is excerpted below: Main House "Restoration of the house started with the stripping of all siding, trim work and porches. The house was then raised 3 inches on the east side, the cripple wall on 2nd floor level was replaced, and roof ridge from north to south was raised 8 inches. The basement portions were removed and a new 5 inch concrete floor over wash gravel was poured. A stabilizing 8 inch steel beam was installed from east to west on steel jacks. The two leveling steel beams were left in place also and are directly under hall and stair partitions. Only the mechanical furnace room was reconstructed in the basement area. The exterior work proceeded with installation of new sills, steel X bracing, replacement of sheathing, rebuilding of the northwest corner. All exterior siding, porch flooring, porch rails, exterior doors, and porch columns are of new materials. The east porch was entirely reconstructed using new concrete blocks, railing and balusters. The roof was rebuilt using new 2 x 6 rafters, new sheathing and shingles. West porch stone stairs and brick walks were reconstructed. All of the duct work and register openings are new. Storage Building "The building was disassembled as per plans. Only six logs and one rafter section and window sash were salvaged. New concrete and brick foundation was constructed. Matching logs were located in the Monroe, Indiana area. All other construction, including door, are of new materials. Two Story Log "The building was disassembled due to lower log and foundation deterioration. All materials used in the reconstruction are new except for 3 salvaged rafters, chimney brick, fifteen logs and 4 sash. Square cut logs for this building are from barn in Monroe, Indiana.	$218,587.13

DATE	DESCRIPTION OF WORK — CONTRACTOR	COST
	Chapel "The interior of the chapel was shored to save the internal shell. The upper section of the apse and all of the exterior portion of the main building was removed. Approximately 30% of the logs, 3 roof rafters and the window sash were salvaged for reuse. The round-type logs were located piecemeal throughout Indiana. After extensive foundation repairs, the building was reconstructed using all new materials for the door, trim work, building and apse roof areas. Brick House "The west wall foundation and lower brick wall were removed. New concrete footing and foundation was installed to a level of one foot below contoured ground level. Matching historical brick was located south of Geneva, Indiana. On completion of brick work, the walls were cleaned and brick joints were repointed using mortar matching existing. Extensive roof rafter repair was done during roof reconstruction. All door and roof trim work was of new construction. General "All of the existing concrete walks were replaced. Trails were deleted due to unknown traffic pattern. Audio cable was installed to exhibit areas and to storage chapel areas. Rotten trees and hedge around main house were removed. New well was constructed for fire and safety."	



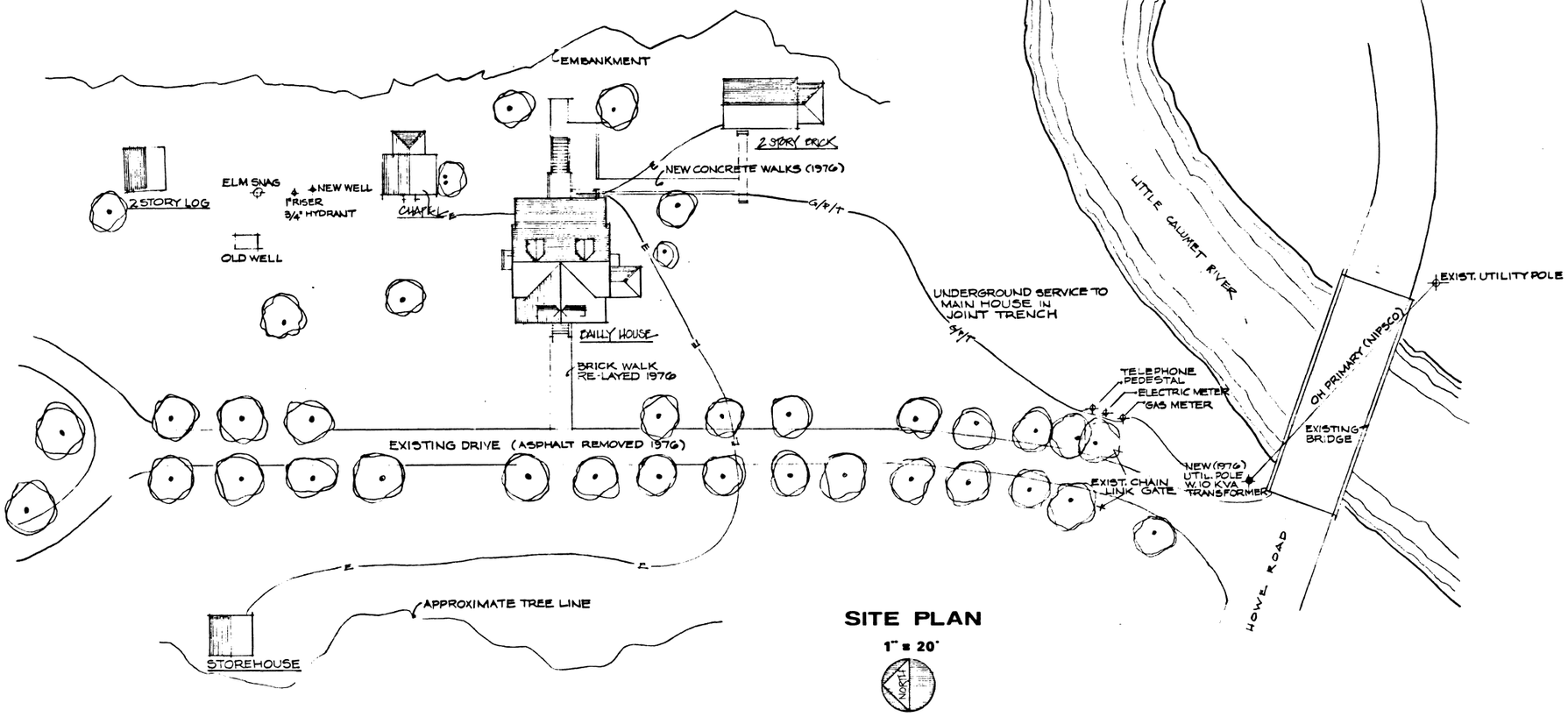
Baily Homestead 1977 Architectural Drawings, Main House, North and East Elevations.
(INDU Museum Collection)

D 1977 ARCHITECTURAL DRAWINGS

Appendix D.

Pages from 1977 Preservation Guide, with notes about scope of 1976 Restoration Project.

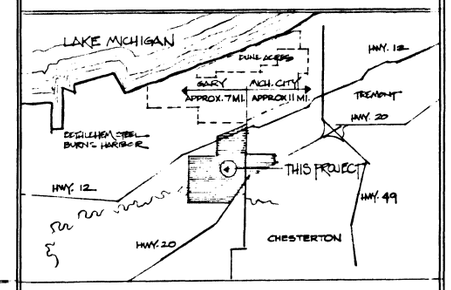
Walter, Douglas S. *Historic Structures Preservation Guide Bailly Homestead.* (U.S. Department of the Interior, National Park Service, Indiana Dunes National Lakeshore, 1977) 16-24.



NATIONAL PARK SERVICE
Department of the Interior

SHEET INDEX

1 SITE PLAN, VICINITY MAP, INDEX
2 ELEVATIONS (E & N) – BAILLY HOUSE
3 ELEVATIONS (W & S) – BAILLY HOUSE
4 PLANS (BSMT. & 3RD) – BAILLY HOUSE
5 PLANS (1ST & 2ND) – BAILLY HOUSE
6 ELEVATIONS – TWO STORY BRICK HOUSE
7 PLAN & ELEVATIONS – TWO STORY LOG
8 ELEVATIONS – BAILLY CHAPEL
9 ELEVATIONS – BAILLY STOREHOUSE



VICINITY MAP
NO SCALE
NORTH

REDUCED SIZE REPRODUCTION

SYMBOLS
—S— BURIED SIGNAL CABLE
—T— BURIED TELEPHONE CABLE
—P— BURIED POWER CABLE
H – HISTORIC GLASS
—G— BURIED GAS LINE
N – NON HISTORIC GLASS

HISTORIC STRUCTURE PRESERVATION GUIDE
BAILLY HOMESTEAD

BASIC DATA

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DENVER SERVICE CENTER

PREPARED
DESIGNED
DRAWN
CHECKED
9-1-77
DATE

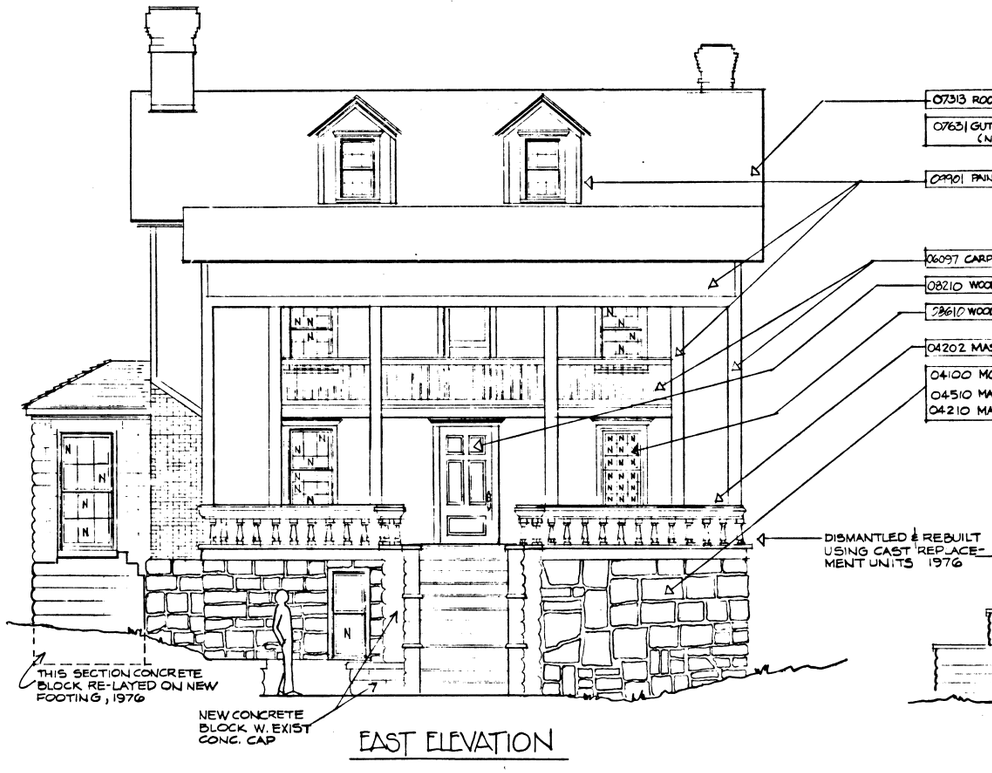
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SITE PLAN
LOCATION WITHIN PARK
BAILLY HOMESTEAD
NAME OF PARK
INDIANA DUNES NATIONAL LAKESHORE
MIDWEST REGION | PORTER COUNTY | INDIANA STATE

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28001
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SHEET 1 OF 9

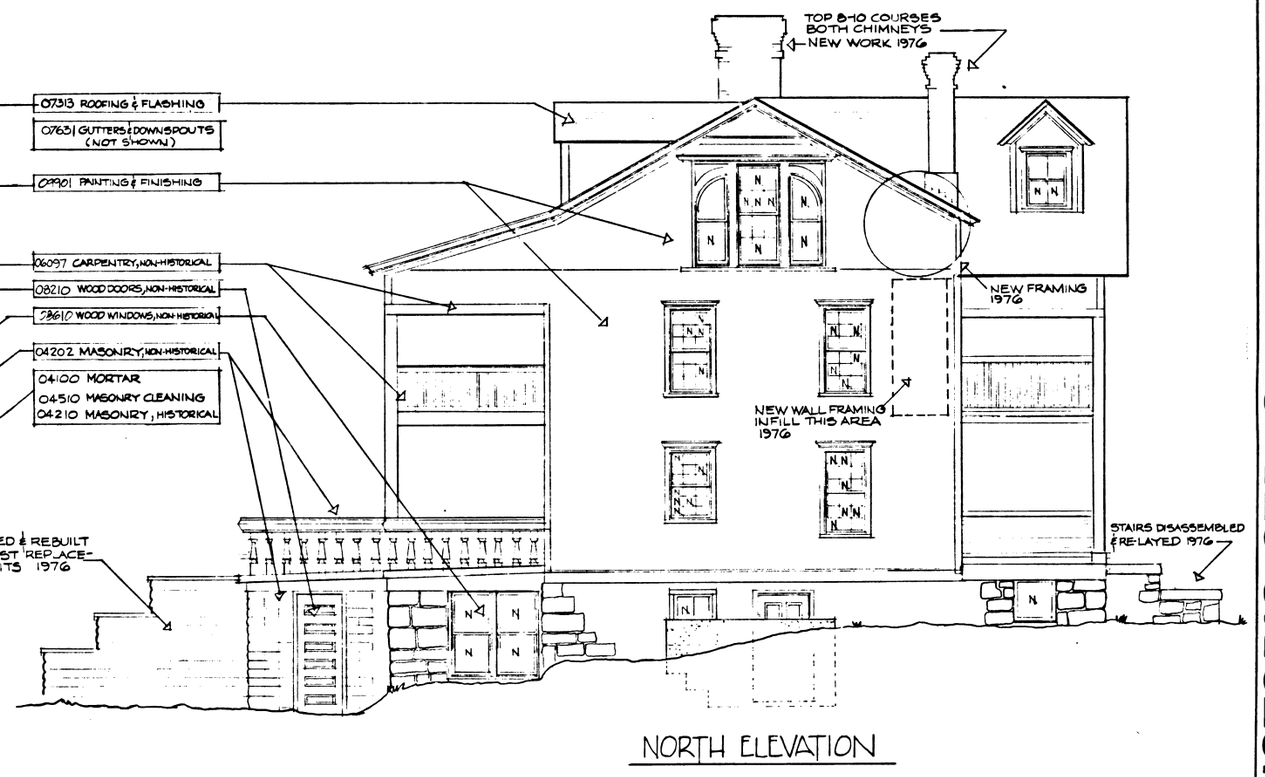
GPO 1974 678 709

NOTES:

* ALL SIDING & TRIM REMOVED. NEW SILLS INSTALLED. ENTIRE STRUCTURE, STEEL X BRACING INSTALLED ALL WALLS PER SKETCHES. SIDING REPLACED, 95% NEW.
* ROOFING & SHEATHING STRIPPED. ROOF REBUILT USING NEW 2×6 RAFTERS, SHEATHING, & CEDAR SHINGLES. NORTH-SOUTH RIDGE LINE RAISED 8". OLD LOG RAFTERS LEFT IN PLACE, NON LOAD BEARING.
* BOTH 2ND FLOOR PORCHES & ALL PORCH COLUMNS REPLACED WITH NEW MATERIAL. ALL ROOF TRIM & PORCH RAILINGS REPLACED WITH REPRODUCTIONS.
* EAST 1ST FLOOR PORCH COMPLETELY DISASSEMBLED & REBUILT USING NEW CAST CONCRETE REPLACEMENTS FOR WALLS, DECK, & RAILINGS.



EAST ELEVATION



NORTH ELEVATION

HISTORIC STRUCTURE PRESERVATION GUIDE
BAILLY HOMESTEAD
Indiana Dunes National Lakeshore 46304
Midwest Region — Porter County Indiana

ELEVATIONS
BAILLY HOUSE
SCALE 1/8"=1'-0"

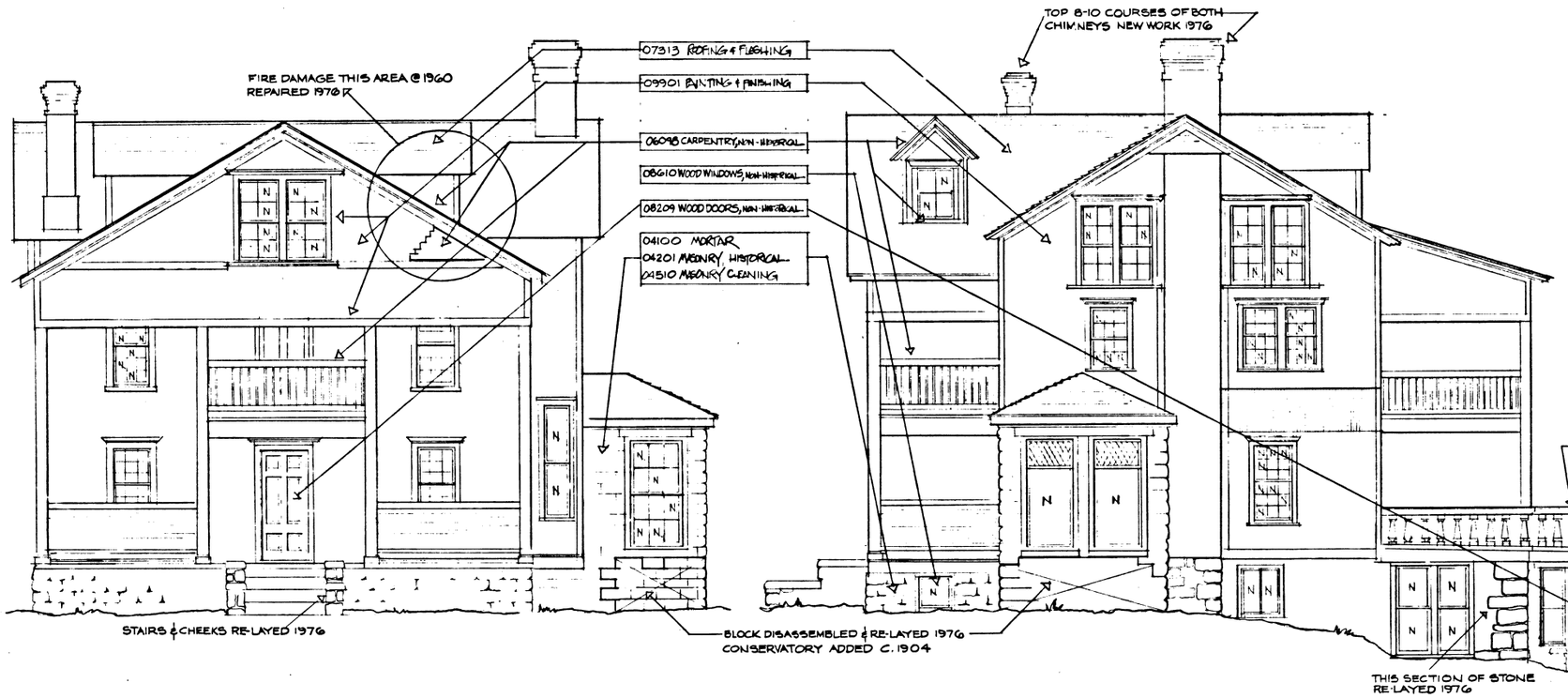
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TRIM LINE

NOTES:

- ALL SIDING & TRIM REMOVED. NEW SILLS INSTALLED AROUND ENTIRE STRUCTURE. STEEL X BRACING INSTALLED ON ALL WALLS PER SKETCHES. SIDING REPLACED WITH 95% NEW.
- ROOFING & SHEATHING STRIPPED. ROOF REBUILT USING NEW 2X6 RAFTERS, SHEATHING, & CEDAR SHINGLES. NORTH-SOUTH RIDGE LINE RAISED 8". OLD LOG RAFTERS LEFT IN PLACE, NON LOAD BEARING.
- BOTH 2ND FLOOR PORCHES & ALL ROOF CROWNS REPLACED WITH NEW MATERIAL. ALL ROOF TRIM & PORCH RAILINGS REPLACED WITH REPRODUCTIONS.
- EAST 1ST FLOOR PORCH COMPLETELY DISASSEMBLED & REBUILT USING NEW CAST CONCRETE REPLACEMENTS FOR WALLS, DECK, & RAILINGS.



WEST ELEVATION

SOUTH ELEVATION

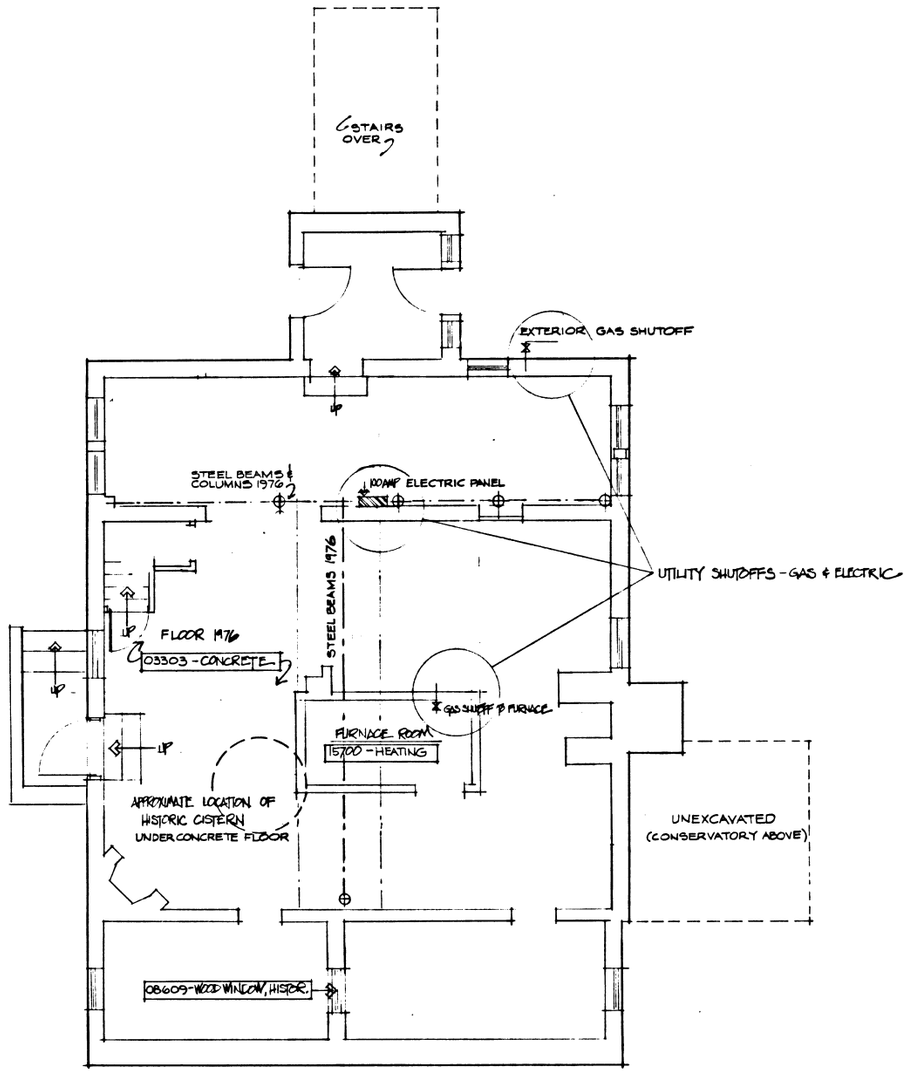
HISTORIC STRUCTURE PRESERVATION GUIDE
BAILLY HOMESTEAD
Indiana Dunes National Lakeshore 46304
Midwest Region — Porter County Indiana

ELEVATIONS
BAILLY HOUSE
SCALE: 1/4" = 1'0"

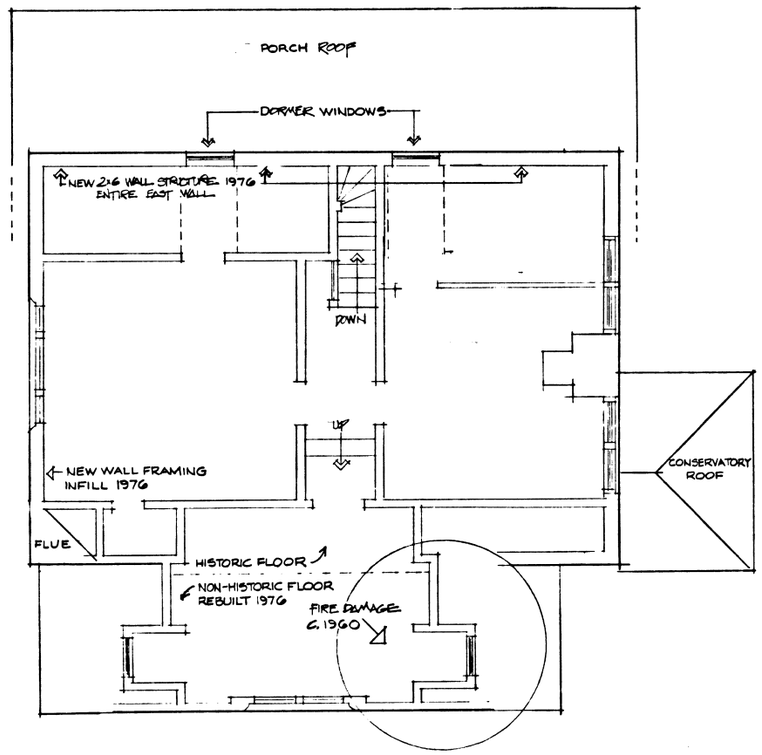
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TRIM LINE



BASEMENT PLAN



THIRD FLOOR PLAN

REFERENCE NORTH

FLOOR PLANS

BAILLY HOUSE

SCALE: 1/4" = 1'-0"

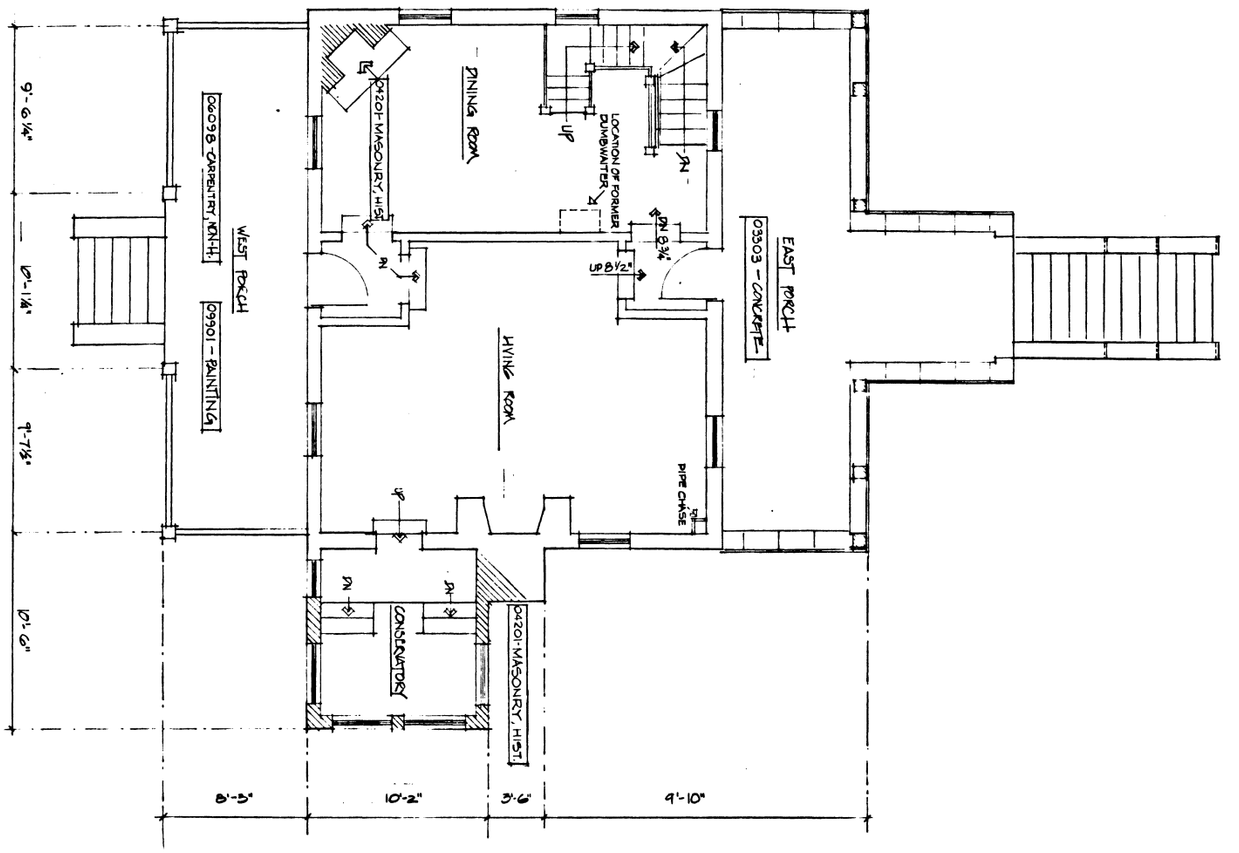
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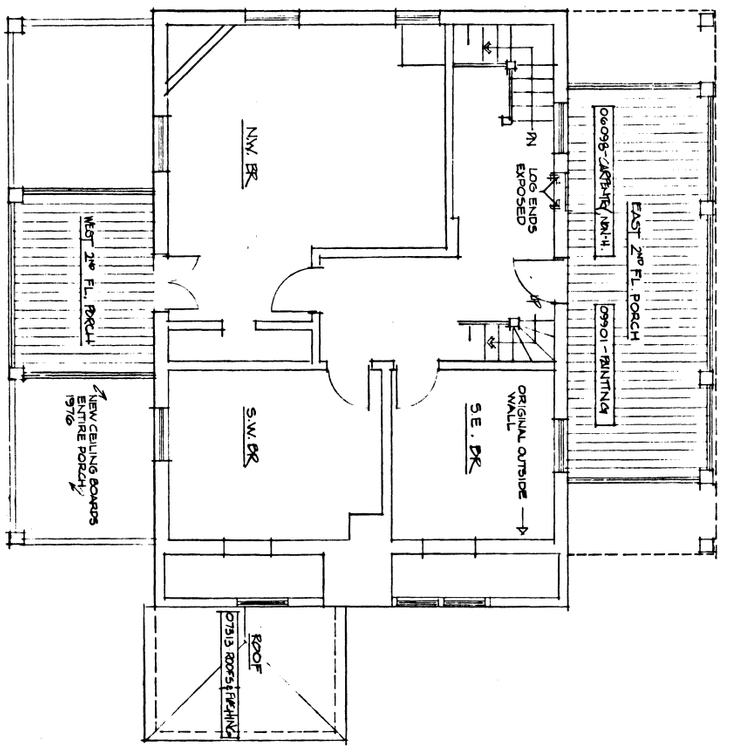
GPO 1977 777 370

TRIM LINE

TRIM LINE



FIRST FLOOR PLAN



SECOND FLOOR PLAN

BACK PLATE

BAILLY HOUSE

SCALE: 1/4" = 1'-0"

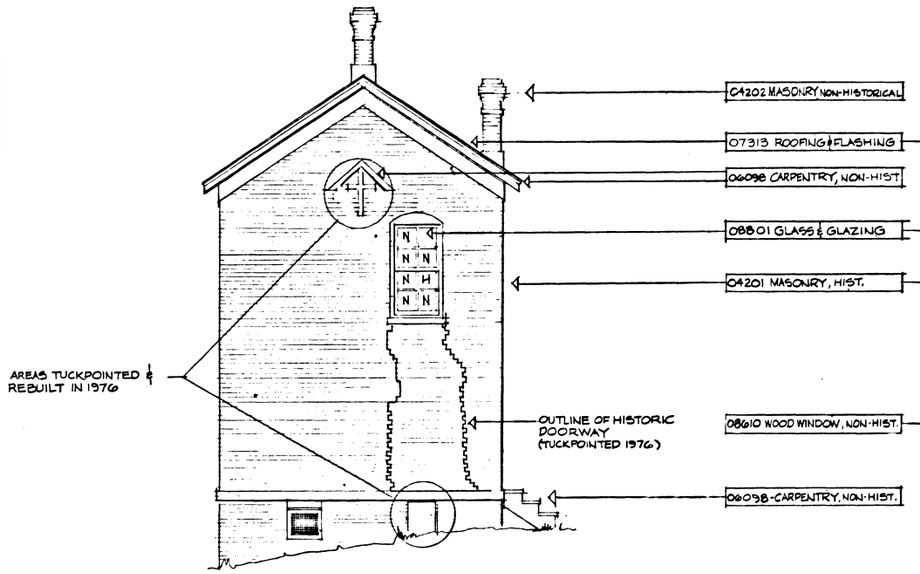
HISTORIC STRUCTURE PRESERVATION GUIDE
BAILLY HOMESTEAD
Indiana Dunes National Lakeshore
Midwest Region Porter County Indiana 46304

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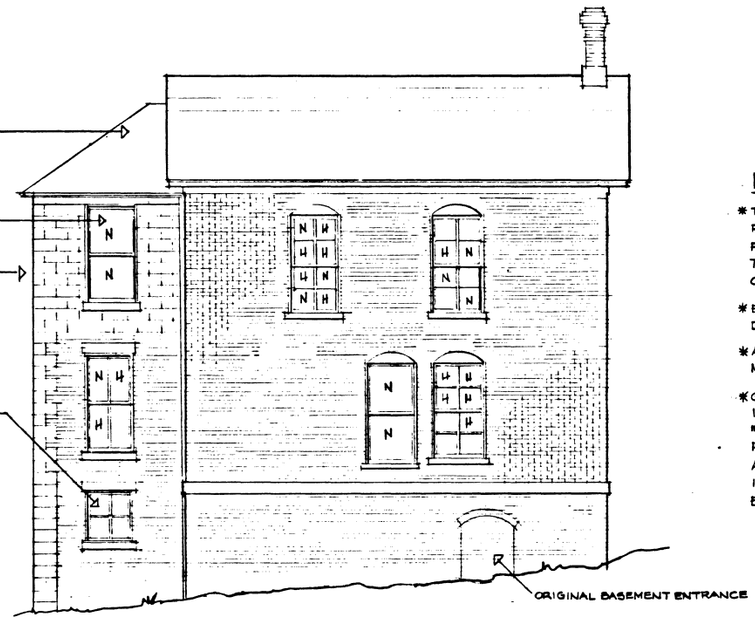
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TRIM LINE

TRIM LINE



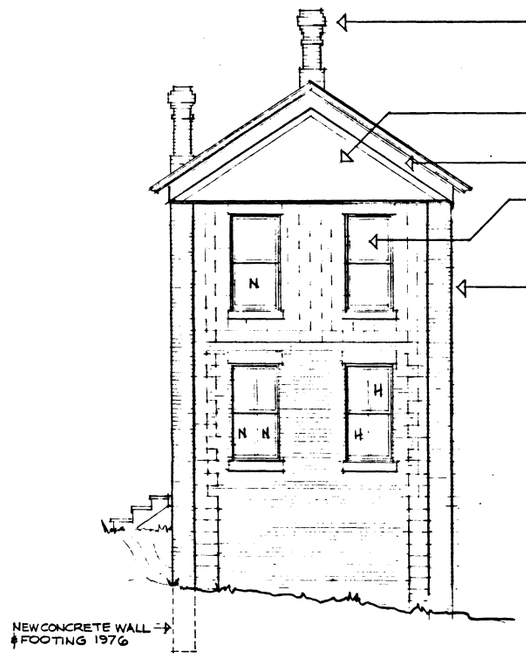
NORTH ELEVATION



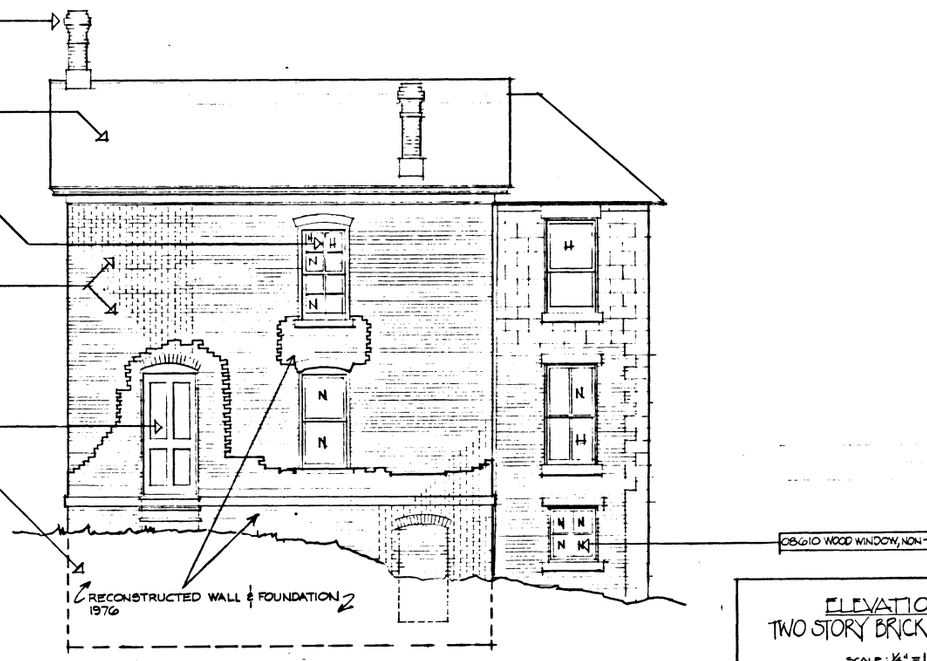
EAST ELEVATION

NOTES:

* THE WEST WALL & FOUNDATION WERE REMOVED AS NOTED. NEW CONCRETE FOOTING & FOUNDATION WERE INSTALLED TO A LEVEL ONE FOOT BELOW GROUND CONTOUR IN 1976.
* EXTENSIVE ROOF RAFTER REPAIR WAS DONE DURING ROOF RECONSTRUCTION.
* ALL DOOR & ROOF TRIMS OF NEW CONSTRUCTION
* GLASS: "N" INDICATES NON-HISTORICAL GLASS INSTALLED IN 1976. "H" INDICATES EXISTING GLASS PROBABLY OF THE HISTORIC PERIOD. ALL UNMARKED GLASS IS OF INDETERMINATE AGE BUT SHALL BE TREATED AS HISTORIC GLASS.



SOUTH ELEVATION



WEST ELEVATION

HISTORIC STRUCTURE PRESERVATION GUIDE
BAILLY HOMESTEAD
Indiana Dunes National Lakeshore 46304
Midwest Region — Porter County Indiana

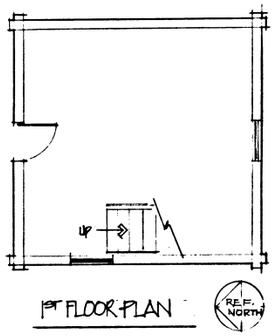
ELEVATIONS
TWO STORY BRICK HOUSE

SCALE: 1/4" = 1'-0"

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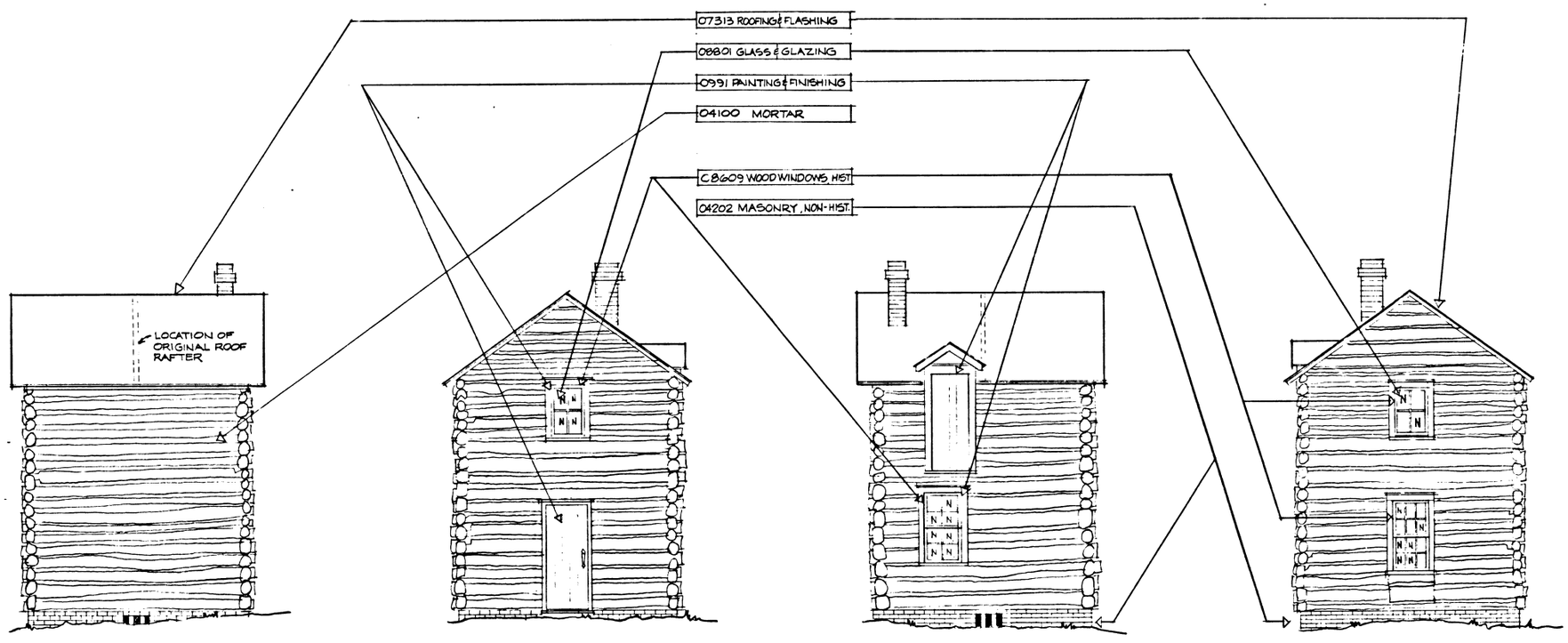
TRIM LINE



1ST FLOOR PLAN

NOTES:

* BUILDING WAS COMPLETELY DISASSEMBLED & REBUILT IN 1976 DUE TO EXTENSIVE ROT & STRUCTURAL FAILURE.
* 20% OF LOGS ARE ORIGINAL TO THIS BUILDING. THE REMAINDER ARE NEW OR HISTORIC, CUT FROM OFF SITE. (MONROE, INDIANA)
* CHIMNEY BRICK WAS SALVAGED AND RELAYED.
* ALL WINDOWS ARE HISTORIC, BUT 90% REGLAZED.
* INTERIOR STAIRWAY IS ORIGINAL.
* ALL WINDOW, ROOF, & DOOR TRIM IS NEW WORK, AS IS FRONT DOOR.
* TWO ORIGINAL LOG RAFTERS & ONE LOG COLLAR BEAM WERE SALVAGED & RE-USED.



NORTH ELEVATION

WEST ELEVATION

SOUTH ELEVATION

EAST ELEVATION

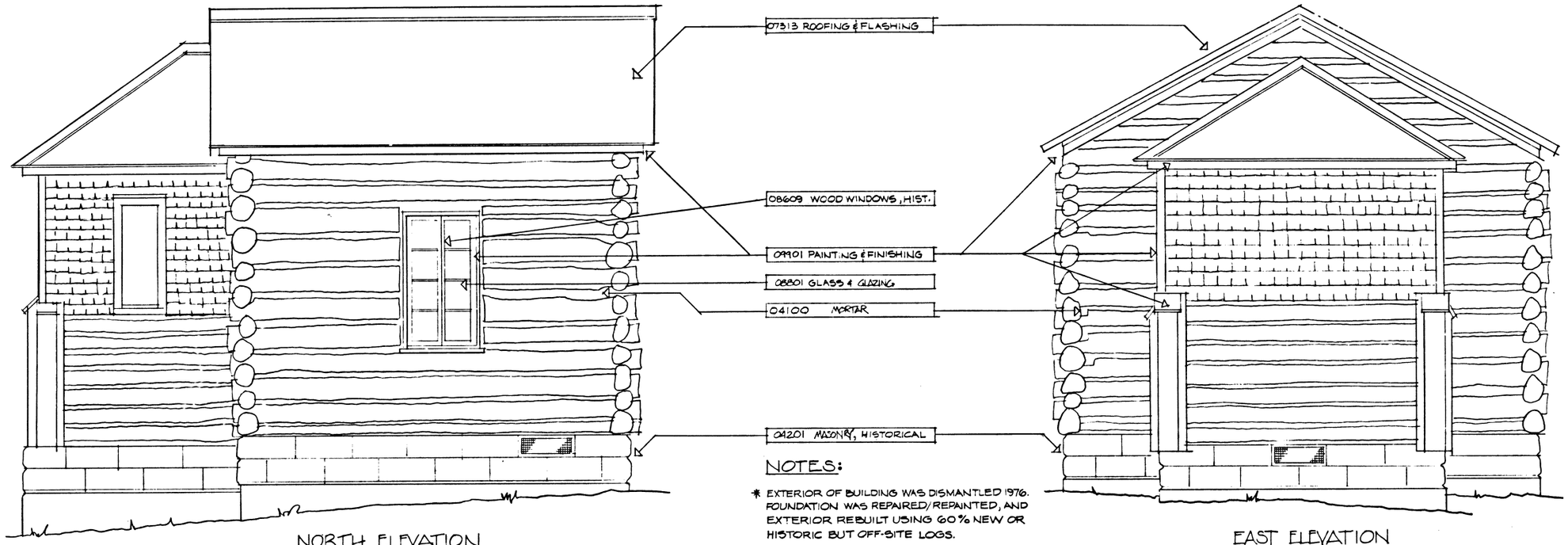
HISTORIC STRUCTURE PRESERVATION GUIDE
BAILLY HOMESTEAD
Indiana Dunes National Lakeshore 46304
Midwest Region
Porter County Indiana

ELEVATIONS & PLANS
TWO STORY LOG BUILDING
SCALE: 1/4" = 1'-0"

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WALTER DRAWN	PKG NO. / SHEET 7
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GPO 1977 777 370

TRIM LINE



NORTH ELEVATION

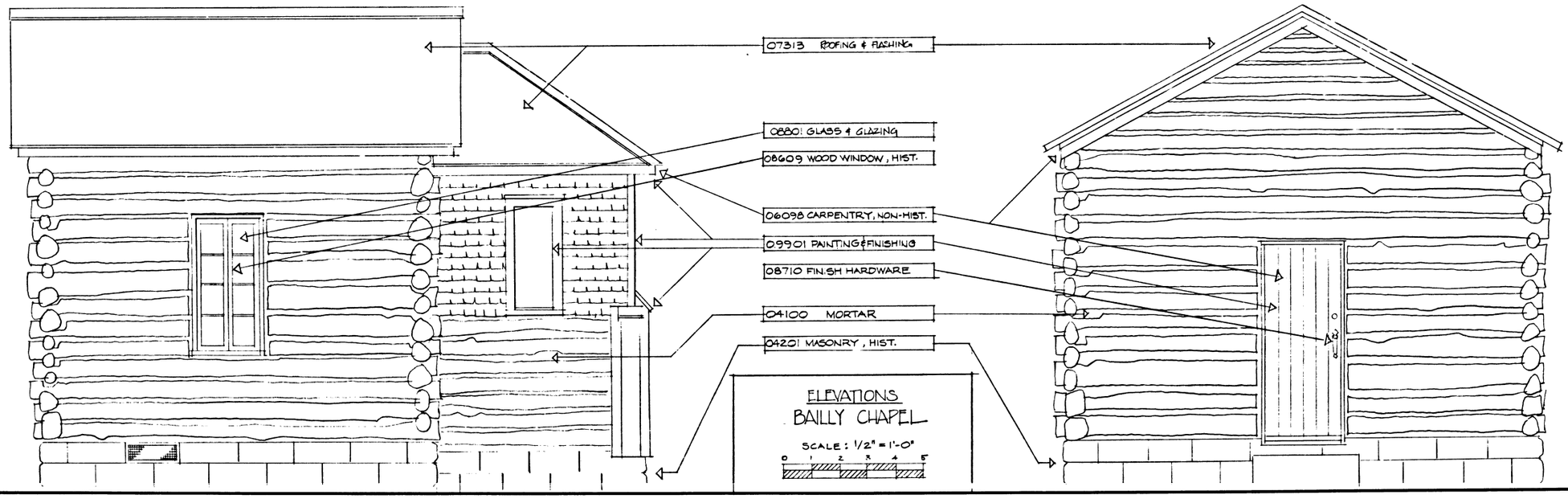
EAST ELEVATION

NOTES:

* EXTERIOR OF BUILDING WAS DISMANTLED 1976. FOUNDATION WAS REPAIRED/REPAINTED, AND EXTERIOR REBUILT USING 60% NEW OR HISTORIC BUT OFF-SITE LOGS.
* 3 ORIGINAL LOG RAFTERS WERE SALVAGED FOR USE IN NEW ROOF CONSTRUCTION.
* ALL ROOF & DOOR TRIM, AS WELL AS THE DOOR ITSELF, ARE NEW CONSTRUCTION.
* ALL WINDOW GLASS IS NEW, GLAZED INTO HISTORIC SASH.

SOUTH ELEVATION

WEST ELEVATION



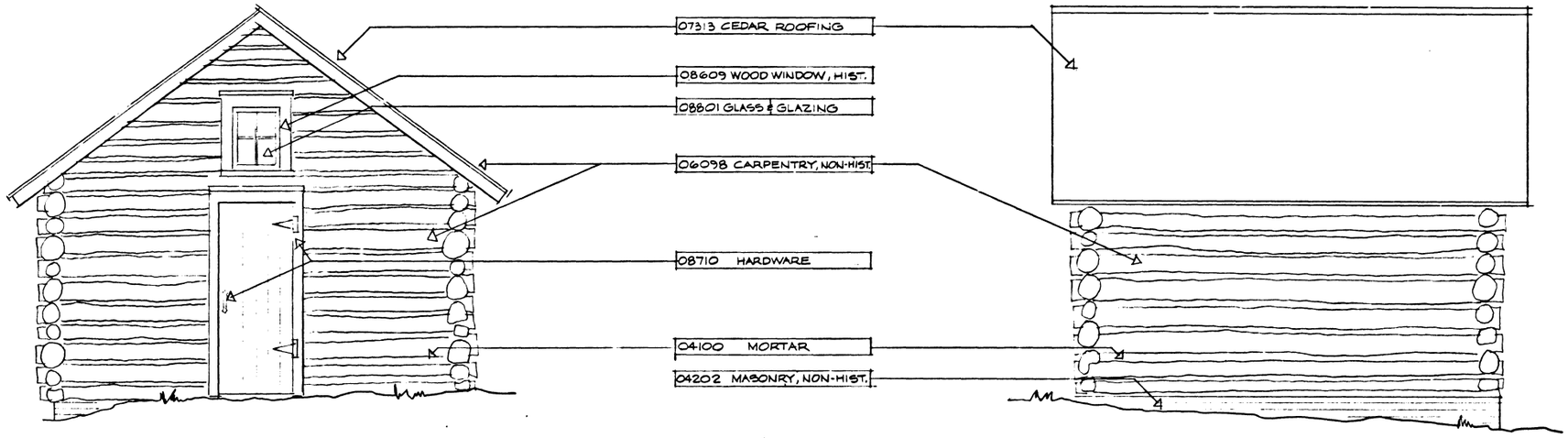
ELEVATIONS
BAILLY CHAPEL
SCALE: 1/2" = 1'-0"
0 1 2 3 4 5

HISTORIC STRUCTURE PRESERVATION GUIDE
BAILLY HOMESTEAD
Indiana Dunes National Lakeshore 46304
Midwest Region — Porter County Indiana

PREPARED	DRAWING NO.
WALTER	626 28001
DESIGNED WALTER	PKG. NO.
DRAWN	SHEET 8
CHECKED 10-1-77	OF 9
DATE	

GPO 1977-777-370

TRIM LINE

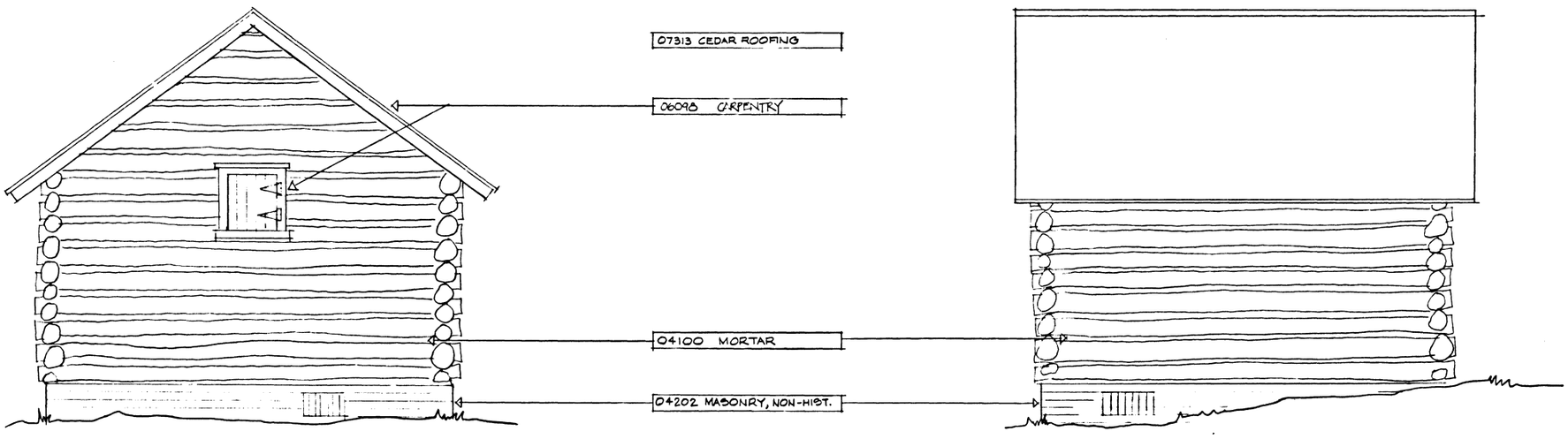


EAST ELEVATION

NORTH ELEVATION

NOTES:

* BUILDING COMPLETELY DISASSEMBLED & REBUILT, 1976.
* SIX LOGS, ONE WINDOW & ONE ROOF RAFTER SECTION WERE SALVAGED. ALL THE REST IS NEW MATERIAL.
* NEW CONCRETE BLOCK AND BRICK FOUNDATION.



WEST ELEVATION

SOUTH ELEVATION

HISTORIC STRUCTURE PRESERVATION GUIDE
BAILLY HOMESTEAD
Indiana Dunes National Lakeshore 46304
Midwest Region — Porter County, Indiana

ELEVATIONS
BAILLY STOREHOUSE
SCALE: ½" = 1'-0"

PREPARED	DRAWING NO.
WALTER	626 28001
DESIGNED WALTER	PKG. NO. / SHEET 9
DRAWN	
CHECKED 10-1-77	OF 9
DATE	

GPO-1977-777-370

TRIM LINE



Structural measurements. (STRATA 2017)

E STRUCTURAL CALCULATIONS

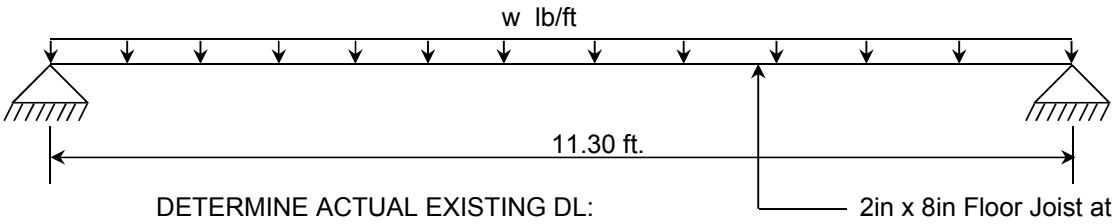
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Main House - First Floor Framing - 11 ft Span		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Eastern White Pine, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	22.5	lb/ft^3			
2" x 8" x 1'-0" Volume =	0.1111	ft^3			
Per ft. weight =	2.50	lb/ft	Spaced at	16"	o.c.
Per Sq. ft. weight =	1.87	psf			

Flooring is 7/8" wood boards and 3/8" Tongue and Groove floor

Assume board, wt. =	3	psf
Tongue and Groove floor, wt. =	1	psf
Misc. Dead load, wt. =	5	psf
Total existing floor DL (Factored) =	**13.05**	psf

A) *FLEXURE ANALYSIS*

Joist Span, L =	11.30	ft
Joist Spacing =	16"	o.c.
Joist Width, b =	2"	
Joist Depth, d =	8"	
Area, b.d =	16"	in^2
Section Modulus, Sx =	21.333	in^3
Moment of Inertia, I_x =	85.333	in^4
F_b =	575	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.2	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1.15	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

= 1371 psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 29{,}238.04$ lb.in

$= 2{,}436.50$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 2{,}436.50$ lb.ft

$\Rightarrow$ $w = 152.65$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **114.49** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **63.40** psf

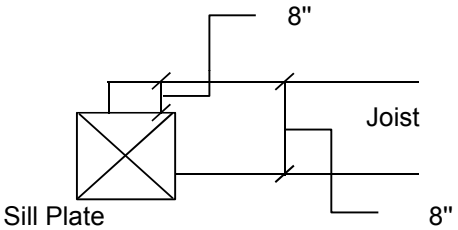
B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

F_v =	135	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor
K_F =	2.88	Format Conversion Factor
Φ =	0.75	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 233.28$ psi



Joist Width, b = 2"

Joist Depth, d = 8"

Depth of remaining at notch, d_n = 8"

$V'_r = \left[\frac{F'_v\, b d_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 2488.320$ lb

$V = \frac{w L}{2}$

$w L/2 = 2488.320$ lb

$\Rightarrow$ $w = 440.41$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **330.31** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **198.29** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E = 1,100,000 psi
C_M = 1.00 Wet service factor (Refer NDS Table 4A, Page #30)
C_t = 1.0 Temperature factor
C_i = 1.0 Incising factor

$E' = E\, C_M\, C_t\, C_i$
= 1,100,000 psi

Joist Width, b = 2"
Joist Depth, d = 8"
Moment of Inertia, I_x = 85.333 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$
= 0.3767 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$
= 0.5650 inch

⇨ 0.38" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 96.377 lb/ft
w_{TL} = 144.565 lb/ft
w_{LL} = 96.376753 lb/ft
w_{TL} = 144.565 lb/ft

JOIST SPACING IS 16" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **72.28** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **108.42** psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **95.38** psf

Deflection for existing DL, Δ_{DL} = 0.068"
Deflection for existing DL, $\Delta_{DL} = \frac{L}{1995}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **72.28** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 63.40 psf

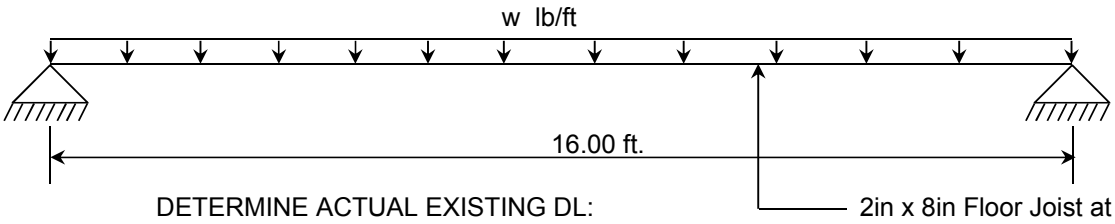
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Main House - First Floor Framing - 16 ft Span		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Eastern White Pine, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	22.5	lb/ft^3			
2" x 8" x 1'-0" Volume =	0.1111	ft^3			
Per ft. weight =	2.50	lb/ft	Spaced at	16"	o.c.
Per Sq. ft. weight =	1.87	psf			

Flooring is 7/8" wood boards and 3/8" Tongue and Groove floor

Assume board, wt. =	3	psf
Tongue and Groove floor, wt. =	1	psf
Misc. Dead load, wt. =	5	psf
Total existing floor DL (Factored) =	**13.05**	psf

A) *FLEXURE ANALYSIS*

Joist Span, L =	16.00	ft
Joist Spacing =	16"	o.c.
Joist Width, b =	2"	
Joist Depth, d =	8"	
Area, b.d =	16"	in^2
Section Modulus, Sx =	21.333	in^3
Moment of Inertia, I_x =	85.333	in^4
F_b =	575	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.2	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1.15	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1371}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 29{,}238.04$ lb.in

$= 2{,}436.50$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 2{,}436.50$ lb.ft

$\Rightarrow$ $w = 76.14$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **57.11** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **27.54** psf

B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

$F_v = 135$ psi

$C_M = 1.00$ Wet service factor (Refer NDS Table 4A, Page #30)

$C_t = 1.0$ Temperature factor

$C_i = 1.0$ Incising factor

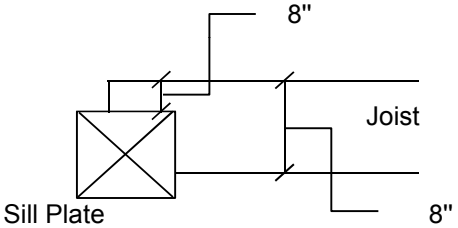
$K_F = 2.88$ Format Conversion Factor

$\Phi = 0.75$ Resistance Factor

$\lambda = 0.80$ Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 233.28$ psi



Joist Width, b = 2"

Joist Depth, d = 8"

Depth of remaining at notch, d_n = 8"

$V'_r = \left[\frac{F'_v\, b d_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 2488.320$ lb

$V = \frac{w L}{2}$

$w L/2 = 2488.320$ lb

$\Rightarrow$ $w = 311.04$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **233.28** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **137.65** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E = 1,100,000 psi
C_M = 1.00 Wet service factor (Refer NDS Table 4A, Page #30)
C_t = 1.0 Temperature factor
C_i = 1.0 Incising factor

$E' = E\, C_M\, C_t\, C_i$
= 1,100,000 psi

Joist Width, b = 2"
Joist Depth, d = 8"
Moment of Inertia, I_x = 85.333 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$
= 0.5333 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$
= 0.8000 inch

⇨ 0.53" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 33.951 lb/ft
w_{TL} = 50.926 lb/ft

w_{LL} = 33.950617 lb/ft
w_{TL} = 50.926 lb/ft

JOIST SPACING IS 16" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **25.46** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **38.19** psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **25.15** psf

Deflection for existing DL, Δ_{DL} = 0.273"
Deflection for existing DL, $\Delta_{DL} = \frac{L}{703}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **25.15** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 25.15 psf

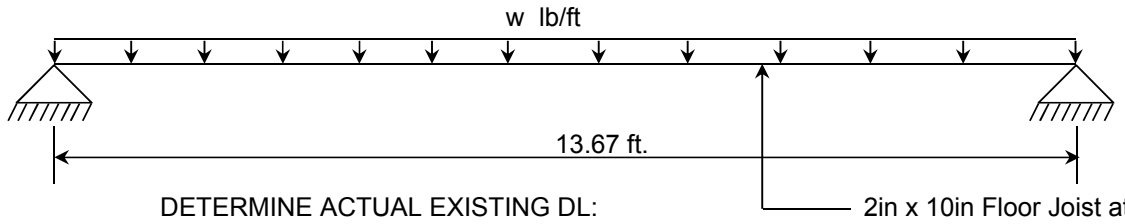
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Main House - Porch Framing		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Douglas Fir-Larch (North), No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	30.6	lb/ft^3			
1'-0" Volume =	0.1389	ft^3			
⇨ Per ft. weight =	4.25	lb/ft	Spaced at	12"	o.c.
Per Sq. ft. weight =	4.25	psf			

Assume board, wt. =	3	psf
Misc. Dead load, wt. =	5	psf
Total existing floor DL (Factored) =	**14.70**	psf

A) *FLEXURE ANALYSIS*

Joist Span, L =	13.67	ft
Joist Spacing =	12"	o.c.
Joist Width, b =	2"	
Joist Depth, d =	10"	
Area, b.d =	20"	in^2
Section Modulus, Sx =	33.333	in^3
Moment of Inertia, I_x =	166.667	in^4
F_b =	850	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.2	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1.15	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{2026}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 67{,}533.52$ lb.in

$= 5{,}627.79$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 5{,}627.79$ lb.ft

$\Rightarrow$ $w = 241.07$ lb/ft

JOIST SPACING IS 12" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **241.07** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **141.48** psf

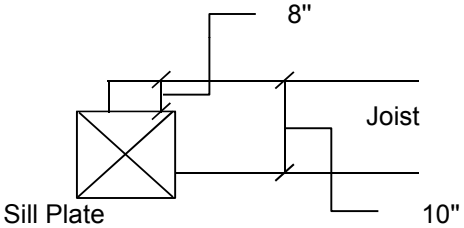
B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

F_v =	180	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor
K_F =	2.88	Format Conversion Factor
Φ =	0.75	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 311.04$ psi



Joist Width, b = 2"

Joist Depth, d = 10"

Depth of remaining at notch, d_n = 8"

$V'_r = \left[\frac{F'_v b d_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 2123.366$ lb

$V = \frac{w L}{2}$

$w L/2 = 2123.366$ lb

$\Rightarrow$ $w = 310.75$ lb/ft

JOIST SPACING IS 12" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **310.75** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **185.03** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E = 1,600,000 psi
C_M = 1.00 Wet service factor (Refer NDS Table 4A, Page #30)
C_t = 1.0 Temperature factor
C_i = 1.0 Incising factor

$E' = E\, C_M\, C_t\, C_i$
= 1,600,000 psi

Joist Width, b = 2"
Joist Depth, d = 10"
Moment of Inertia, I_x = 166.667 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$
= 0.4555 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$
= 0.6833 inch

⇨ 0.46" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 154.789 lb/ft
w_{TL} = 232.184 lb/ft

w_{LL} = 154.78922 lb/ft
w_{TL} = 232.184 lb/ft

JOIST SPACING IS 12" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **154.79** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **232.18** psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **217.49** psf

Deflection for existing DL, Δ_{DL} = 0.043"
Deflection for existing DL, $\Delta_{DL} = \frac{L}{3792}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **154.79** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 141.48 psf

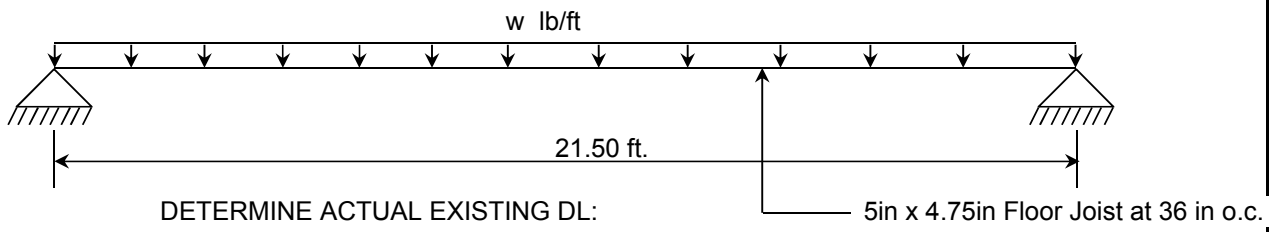
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Main House - Second Floor Framing		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is White Oak, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	45.6	lb/ft^3			
5" x 4 3/4" x 1'-0" Volume =	0.1649	ft^3			
Per ft. weight =	7.51	lb/ft	Spaced at	36"	o.c.
Per Sq. ft. weight =	2.50	psf			

Flooring is 1 1/8" wood boards and 5/16" floor

Assume board, wt. =	3	psf
Tongue and Groove floor, wt. =	1	psf
Misc. Dead load, wt. =	1	psf
Total existing floor DL (Factored) =	**9.01**	psf

A) *FLEXURE ANALYSIS*

Joist Span, L =	21.50	ft
Joist Spacing =	36"	o.c.
Joist Width, b =	5"	
Joist Depth, d =	4.75"	
Area, b.d =	23.75"	in^2
Section Modulus, Sx =	18.802	in^3
Moment of Inertia, I_x =	44.655	in^4
F_b =	750	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.5	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1943}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 36{,}534.33$ lb.in

$= 3{,}044.53$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 3{,}044.53$ lb.ft

$\Rightarrow$ $w = 52.69$ lb/ft

JOIST SPACING IS 36" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **17.56** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **5.35** psf

B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

$F_v = 205$ psi

$C_M = 1.00$ Wet service factor (Refer NDS Table 4A, Page #30)

$C_t = 1.0$ Temperature factor

$C_i = 1.0$ Incising factor

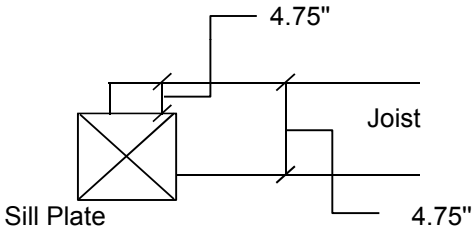
$K_F = 2.88$ Format Conversion Factor

$\Phi = 0.75$ Resistance Factor

$\lambda = 0.80$ Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 354.24$ psi



Joist Width, b = 5"

Joist Depth, d = 4.75"

Depth of remaining at notch, d_n = 4.75"

$V'_r = \left[\frac{F'_v b d_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 5608.800$ lb

$V = \frac{w L}{2}$

$w L/2 = 5608.800$ lb

$\Rightarrow$ $w = 521.75$ lb/ft

JOIST SPACING IS 36" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **173.92** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **103.07** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E = 1,000,000 psi
C_M = 1.00 Wet service factor (Refer NDS Table 4A, Page #30)
C_t = 1.0 Temperature factor
C_i = 1.0 Incising factor

$E' = E\, C_M\, C_t\, C_i$
= 1,000,000 psi

Joist Width, b = 5"
Joist Depth, d = 4.75"
Moment of Inertia, I_x = 44.655 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$
= 0.7167 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$
= 1.0750 inch

⇨ 0.72" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 6.657 lb/ft
w_{TL} = 9.985 lb/ft

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w_{LL} = 6.6565689 lb/ft
w_{TL} = 9.985 lb/ft

JOIST SPACING IS 36" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **2.22** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **3.33** psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **-5.68** psf

Deflection for existing DL, Δ_{DL} = 2.909"
Deflection for existing DL, $\Delta_{DL} = \frac{L}{89}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **-5.68** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = -5.68 psf

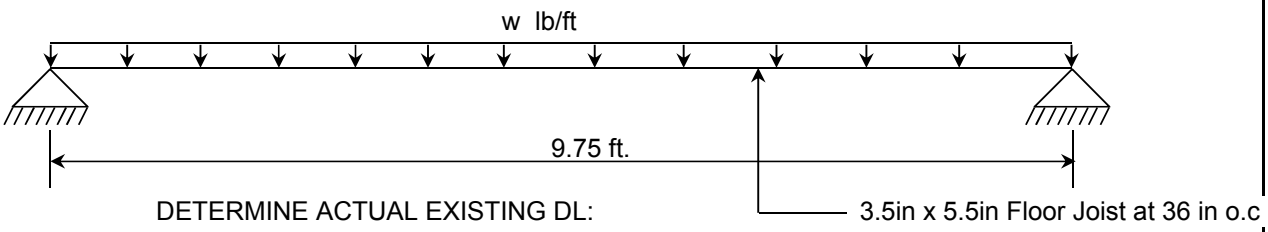
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Main House - Second Floor Framing		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is White Oak, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	45.6	lb/ft^3			
5 1/2" x 3 1/2" x 1'-0" Volume =	0.1337	ft^3			
Per ft. weight =	6.09	lb/ft	Spaced at	36"	o.c.
Per Sq. ft. weight =	2.03	psf			
Assume board, wt. =	3	psf			
Tongue and Groove floor, wt. =	1	psf			
Misc. Dead load, wt. =	1	psf			
Total existing floor DL (Factored) =	**8.44**	psf			

A) *FLEXURE ANALYSIS*

Joist Span, L =	9.75	ft
Joist Spacing =	36"	o.c.
Joist Width, b =	3.5"	
Joist Depth, d =	5.5"	
Area, b.d =	19.25"	in^2
Section Modulus, Sx =	17.646	in^3
Moment of Inertia, I_x =	48.526	in^4
F_b =	750	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.5	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1943}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 34{,}287.62$ lb.in

$= 2{,}857.30$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 2{,}857.30$ lb.ft

$\Rightarrow$ $w = 240.46$ lb/ft

JOIST SPACING IS 36" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **80.15** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **44.82** psf

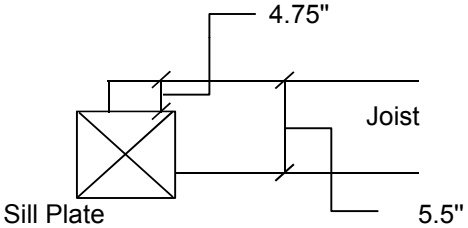
B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

F_v =	205	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor
K_F =	2.88	Format Conversion Factor
Φ =	0.75	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 354.24$ psi



Joist Width, b = 3.5"

Joist Depth, d = 5.5"

Depth of remaining at notch, d_n = 4.75"

$V'_r = \left[\frac{F'_v\, b d_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 2928.396$ lb

$V = \frac{w L}{2}$

$w L/2 = 2928.396$ lb

$\Rightarrow$ $w = 600.70$ lb/ft

JOIST SPACING IS 36" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **200.23** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **119.87** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E = 1,000,000 psi
C_M = 1.00 Wet service factor (Refer NDS Table 4A, Page #30)
C_t = 1.0 Temperature factor
C_i = 1.0 Incising factor

$E' = E\, C_M\, C_t\, C_i$
= 1,000,000 psi

Joist Width, b = 3.5"
Joist Depth, d = 5.5"
Moment of Inertia, I_x = 48.526 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$
= 0.3250 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$
= 0.4875 inch

⇨ 0.33" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 77.563 lb/ft
w_{TL} = 116.345 lb/ft

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w_{LL} = 77.563473 lb/ft
w_{TL} = 116.345 lb/ft

JOIST SPACING IS 36" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **25.85** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **38.78** psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **30.35** psf

Deflection for existing DL, Δ_{DL} = 0.106"
Deflection for existing DL, $\Delta_{DL} = \frac{L}{1103}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **25.85** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 25.85 psf

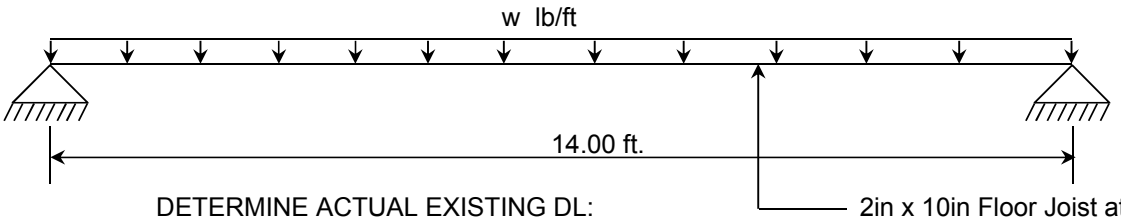
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Brick House - North Portion		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Eastern White Pine, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	22.5	lb/ft^3			
1'-0" Volume =	0.1389	ft^3			
⇨ Per ft. weight =	3.12	lb/ft	Spaced at	16"	o.c.
Per Sq. ft. weight =	2.34	psf			

Assume board, wt. =	3	psf
Misc. Dead load, wt. =	5	psf
Total existing floor DL (Factored) =	**12.41**	psf

A) *FLEXURE ANALYSIS*

Joist Span, L =	14.00	ft
Joist Spacing =	16"	o.c.
Joist Width, b =	2"	
Joist Depth, d =	10"	
Area, b.d =	20"	in^2
Section Modulus, Sx =	33.333	in^3
Moment of Inertia, I_x =	166.667	in^4
F_b =	575	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.2	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1.15	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1371}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 45{,}684.44$ lb.in

$= 3{,}807.04$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 3{,}807.04$ lb.ft

$\Rightarrow$ $w = 155.39$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **116.54** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **65.08** psf

B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

$F_v = 140$ psi

$C_M = 1.00$ Wet service factor (Refer NDS Table 4A, Page #30)

$C_t = 1.0$ Temperature factor

$C_i = 1.0$ Incising factor

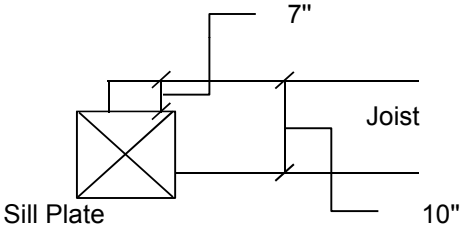
$K_F = 2.88$ Format Conversion Factor

$\Phi = 0.75$ Resistance Factor

$\lambda = 0.80$ Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 241.92$ psi



Joist Width, b = 2"

Joist Depth, d = 10"

Depth of remaining at notch, d_n = 7"

$V'_r = \left[\frac{F'_v b d_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 1106.381$ lb

$V = \frac{w L}{2}$

$w L/2 = 1106.381$ lb

$\Rightarrow$ $w = 158.05$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **118.54** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **66.33** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E = 1,100,000 psi
C_M = 1.00 Wet service factor (Refer NDS Table 4A, Page #30)
C_t = 1.0 Temperature factor
C_i = 1.0 Incising factor

$E' = E\, C_M\, C_t\, C_i$
= 1,100,000 psi

Joist Width, b = 2"
Joist Depth, d = 10"
Moment of Inertia, I_x = 166.667 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$
= 0.4667 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$
= 0.7000 inch

⇨ 0.47" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 98.981 lb/ft
w_{TL} = 148.472 lb/ft

w_{LL} = 98.981391 lb/ft
w_{TL} = 148.472 lb/ft

JOIST SPACING IS 16" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **74.24** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **111.35** psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **98.95** psf

Deflection for existing DL, Δ_{DL} = 0.078"
Deflection for existing DL, $\Delta_{DL} = \frac{L}{2154}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **74.24** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 65.08 psf

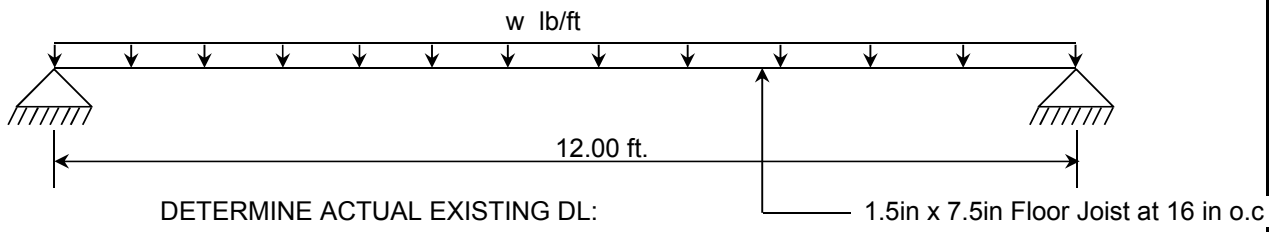
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Brick House - South Portion		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Eastern Hemlock, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	25.6	lb/ft^3			
1'-0" Volume =	0.0781	ft^3			
⇨ Per ft. weight =	2.00	lb/ft	Spaced at	16"	o.c.
Per Sq. ft. weight =	1.50	psf			

Assume board, wt. =	3	psf
Misc. Dead load, wt. =	5	psf
Total existing floor DL (Factored) =	**11.40**	psf

A) *FLEXURE ANALYSIS*

Joist Span, L =	12.00	ft
Joist Spacing =	16"	o.c.
Joist Width, b =	1.5"	
Joist Depth, d =	7.5"	
Area, b.d =	11.25"	in^2
Section Modulus, Sx =	14.063	in^3
Moment of Inertia, I_x =	52.734	in^4
F_b =	575	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.2	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1.15	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1371}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 19{,}273.12$ lb.in

$= 1{,}606.09$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 1{,}606.09$ lb.ft

$\Rightarrow$ $w = 89.23$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **66.92** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **34.70** psf

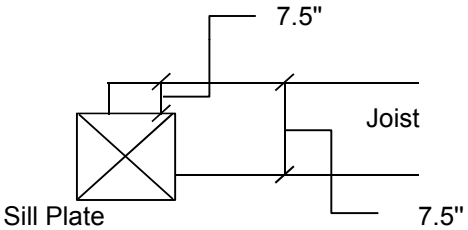
B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

F_v =	170	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor
K_F =	2.88	Format Conversion Factor
Φ =	0.75	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 293.76$ psi



Joist Width, b = 1.5"

Joist Depth, d = 7.5"

Depth of remaining at notch, d_n = 7.5"

$V'_r = \left[\frac{F'_v\, bd_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 2203.200$ lb

$V = \frac{w L}{2}$

$w L/2 = 2203.200$ lb

$\Rightarrow$ $w = 367.20$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **275.40** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **165.00** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E =	1,100,000	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor

$E' = E\, C_M\, C_t\, C_i$

$= 1{,}100{,}000$ psi

Joist Width, b = 1.5"

Joist Depth, d = 7.5"

Moment of Inertia, I_x = 52.734 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$ = 0.4000 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$ = 0.6000 inch

⇨ 0.40" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 49.732 lb/ft

w_{TL} = 74.599 lb/ft

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w_{LL} = 49.73235 lb/ft

w_{TL} = 74.599 lb/ft

JOIST SPACING IS 16" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **37.30** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **55.95** psf

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **44.55** psf

Deflection for existing DL, Δ_{DL} = 0.122"

Deflection for existing DL, $\Delta_{DL} = \frac{L}{1178}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **37.30** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 34.70 psf

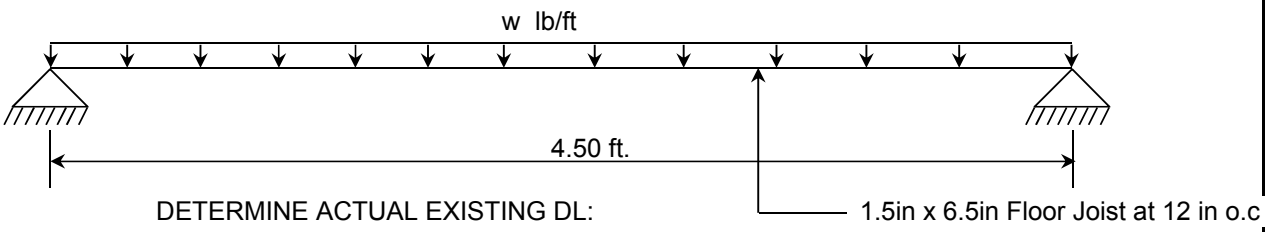
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Two Story Log - Beam at Stairs		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Eastern White Pine, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	22.5	lb/ft^3			
1'-0" Volume =	0.0677	ft^3			
⇨ Per ft. weight =	1.52	lb/ft	Spaced at	12"	o.c.
Per Sq. ft. weight =	1.52	psf			
Assume board, wt. =	3	psf			
Tongue and Groove floor, wt. =	1	psf			
Misc. Dead load, wt. =	200	psf	(Hewn Logs)		
Total existing floor DL (Factored) =	**246.63**	psf			

A) *FLEXURE ANALYSIS*

Joist Span, L =	4.50	ft
Joist Spacing =	12"	o.c.
Joist Width, b =	1.5"	
Joist Depth, d =	6.5"	
Area, b.d =	9.75"	in^2
Section Modulus, Sx =	10.563	in^3
Moment of Inertia, I_x =	34.328	in^4
F_b =	575	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.2	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1.15	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1371}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 14{,}476.26$ lb.in

$= 1{,}206.35$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 1{,}206.35$ lb.ft

$\Rightarrow$ $w = 476.58$ lb/ft

JOIST SPACING IS 12" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **476.58** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **143.72** psf

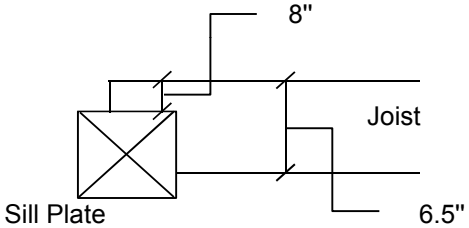
B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

F_v =	140	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor
K_F =	2.88	Format Conversion Factor
Φ =	0.75	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 241.92$ psi



Joist Width, b = 1.5"

Joist Depth, d = 6.5"

Depth of remaining at notch, d_n = 8"

$V'_r = \left[\frac{F'_v\, bd_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 2931.670$ lb

$V = \frac{w L}{2}$

$w L/2 = 2931.670$ lb

$\Rightarrow$ $w = 1302.96$ lb/ft

JOIST SPACING IS 12" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **1302.96** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **660.21** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E =	1,100,000	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor

$E' = E\, C_M\, C_t\, C_i$

$= 1{,}100{,}000$ psi

Joist Width, b = 1.5"

Joist Depth, d = 6.5"

Moment of Inertia, I_x = 34.328 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$

$=$ 0.1500 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$

$=$ 0.2250 inch

⇨ 0.15" $= \frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 613.905 lb/ft

w_{TL} = 920.858 lb/ft

---

w_{LL} = 613.9054 lb/ft

w_{TL} = 920.858 lb/ft

JOIST SPACING IS 12" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **613.91** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **920.86** psf

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **674.23** psf

Deflection for existing DL, Δ_{DL} = 0.060"

Deflection for existing DL, $\Delta_{DL} = \frac{L}{896}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **613.91** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 143.72 psf

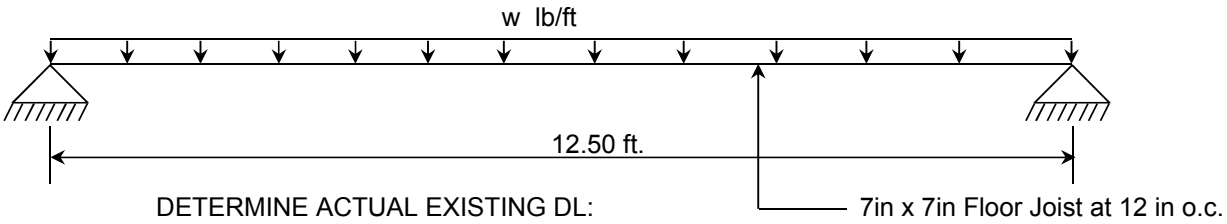
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Two Story Log - Hewn Beam		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Eastern White Pine, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	22.5	lb/ft^3			
2" x 8" x 1'-0" Volume =	0.3403	ft^3			
⇨ Per ft. weight =	7.64	lb/ft	Spaced at	12"	o.c.
Per Sq. ft. weight =	7.64	psf			
Assume board, wt. =	3	psf			
Tongue and Groove floor, wt. =	1	psf			
Misc. Dead load, wt. =	5	psf			
Total existing floor DL (Factored) =	**19.97**	psf			

A) *FLEXURE ANALYSIS*

Joist Span, L =	12.50	ft
Joist Spacing =	22"	o.c.
Joist Width, b =	7"	
Joist Depth, d =	7"	
Area, b.d =	49"	in^2
Section Modulus, Sx =	57.167	in^3
Moment of Inertia, I_x =	200.083	in^4
F_b =	575	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.5	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1490}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 85{,}161.76$ lb.in

$= 7{,}096.81$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 7{,}096.81$ lb.ft

$\Rightarrow$ $w = 363.36$ lb/ft

JOIST SPACING IS 12" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **363.36** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **214.62** psf

B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

$F_v = 140$ psi

$C_M = 1.00$ Wet service factor (Refer NDS Table 4A, Page #30)

$C_t = 1.0$ Temperature factor

$C_i = 1.0$ Incising factor

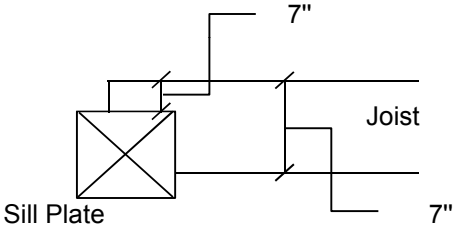
$K_F = 2.88$ Format Conversion Factor

$\Phi = 0.75$ Resistance Factor

$\lambda = 0.80$ Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 241.92$ psi



Joist Width, b = 7"

Joist Depth, d = 7"

Depth of remaining at notch, d_n = 7"

$V'_r = \left[\frac{F'_v b d_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 7902.720$ lb

$V = \frac{w L}{2}$

$w L/2 = 7902.720$ lb

$\Rightarrow$ $w = 1264.44$ lb/ft

JOIST SPACING IS 12" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **1264.44** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **777.79** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E =	1,100,000	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor

$E' = E\, C_M\, C_t\, C_i$

$= 1{,}100{,}000$ psi

Joist Width, b = 7"

Joist Depth, d = 7"

Moment of Inertia, I_x = 200.083 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$

$=$ 0.4167 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$

$=$ 0.6250 inch

⇨ 0.42" $= \frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 166.944 lb/ft

w_{TL} = 250.415 lb/ft

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w_{LL} = 166.9436 lb/ft

w_{TL} = 250.415 lb/ft

JOIST SPACING IS 12" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **166.94** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **250.42** psf

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **230.44** psf

Deflection for existing DL, Δ_{DL} = 0.050"

Deflection for existing DL, $\Delta_{DL} = \frac{L}{3009}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **166.94** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 166.94 psf

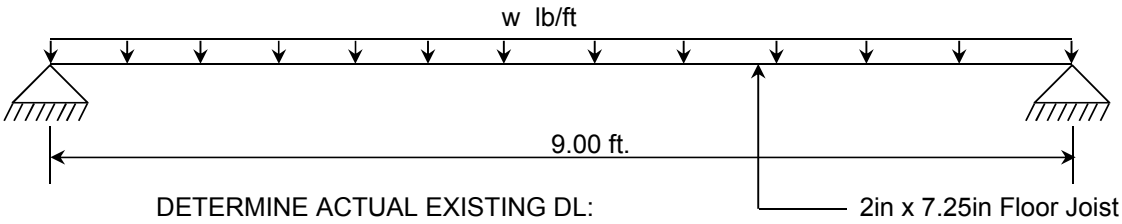
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Chapel		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Eastern White Pine, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	22.5	lb/ft^3			
2" x 8" x 1'-0" Volume =	0.1007	ft^3			
⇨ Per ft. weight =	2.26	lb/ft	Spaced at	16"	o.c.
Per Sq. ft. weight =	1.70	psf			

Assume board, wt. =	3	psf
Misc. Dead load, wt. =	5	psf
Total existing floor DL (Factored) =	**11.64**	psf

A) *FLEXURE ANALYSIS*

Joist Span, L =	9.00	ft
Joist Spacing =	16"	o.c.
Joist Width, b =	2"	
Joist Depth, d =	7.25"	
Area, b.d =	14.5"	in^2
Section Modulus, Sx =	17.521	in^3
Moment of Inertia, I_x =	63.513	in^4
F_b =	575	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.2	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1.15	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1371}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 24{,}012.88$ lb.in

$= 2{,}001.07$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 2{,}001.07$ lb.ft

$\Rightarrow$ $w = 197.64$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **148.23** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **85.37** psf

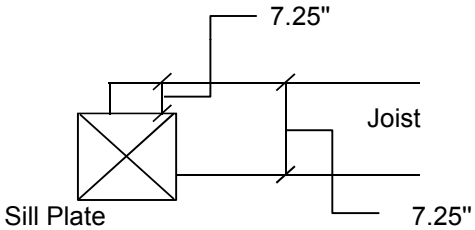
B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

F_v =	135	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor
K_F =	2.88	Format Conversion Factor
Φ =	0.75	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 233.28$ psi



Joist Width, b = 2"

Joist Depth, d = 7.25"

Depth of remaining at notch, d_n = 7.25"

$V'_r = \left[\frac{F'_v\, b d_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 2255.040$ lb

$V = \frac{w L}{2}$

$w L/2 = 2255.040$ lb

$\Rightarrow$ $w = 501.12$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **375.84** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **227.63** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E = 1,100,000 psi
C_M = 1.00 Wet service factor (Refer NDS Table 4A, Page #30)
C_t = 1.0 Temperature factor
C_i = 1.0 Incising factor

$E' = E\, C_M\, C_t\, C_i$
= 1,100,000 psi

Joist Width, b = 2"
Joist Depth, d = 7.25"
Moment of Inertia, I_x = 63.513 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$
= 0.3000 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$
= 0.4500 inch

⇨ 0.30" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 141.979 lb/ft
w_{TL} = 212.969 lb/ft

w_{LL} = 141.97901 lb/ft
w_{TL} = 212.969 lb/ft

JOIST SPACING IS 16" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **106.48** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **159.73** psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **148.09** psf

Deflection for existing DL, Δ_{DL} = 0.033"
Deflection for existing DL, $\Delta_{DL} = \frac{L}{3295}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **106.48** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 85.37 psf

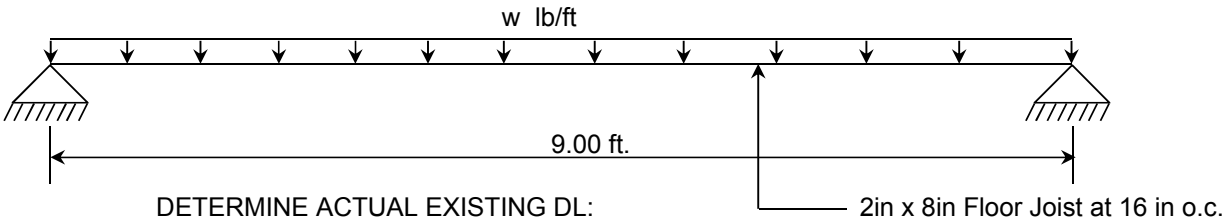
WOOD MEMBER DESIGN/ANALYSIS

Project:	NPS - Bailly Homestead	**Date:**	10/9/2017
Project #	2017065.00	**Engineer:**	PDS
Description:	Chapel		

1) DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

i) Wood Joist species is Eastern White Pine, No. 2



DETERMINE ACTUAL EXISTING DL:

Wood Density =	22.5	lb/ft^3			
2" x 8" x 1'-0" Volume =	0.1111	ft^3			
⇨ Per ft. weight =	2.50	lb/ft	Spaced at	16"	o.c.
Per Sq. ft. weight =	1.87	psf			

Assume board, wt. =	3	psf
Misc. Dead load, wt. =	5	psf
Total existing floor DL (Factored) =	**11.85**	psf

A) *FLEXURE ANALYSIS*

Joist Span, L =	9.00	ft
Joist Spacing =	16"	o.c.
Joist Width, b =	2"	
Joist Depth, d =	8"	
Area, b.d =	16"	in^2
Section Modulus, Sx =	21.333	in^3
Moment of Inertia, I_x =	85.333	in^4
F_b =	575	psi

FLEXURAL ADJUSTMENT FACTORS

C_M =	1.00	Wet service factor (Refer NDS Table 4A, footnote, Page #30)
C_t =	1.0	Temperature factor
C_L =	1.0	Beam stability factor (Joists braced by flooring)
C_F =	1.2	Size factor (Refer NDS Table 4A, Page #30)
C_i =	1.0	Incising factor
C_r =	1.15	Repetative member factor
K_F =	2.54	Format Conversion Factor
Φ =	0.85	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_b = C_M\ C_t\ C_L\ C_F\ C_i\ C_r\ K_F\ \Phi\ \lambda$

$= \underline{1371}$ psi

ULTIMATE MOMENT CAPACITY

$M = S_X F'_b$

$= 29{,}238.04$ lb.in

$= 2{,}436.50$ lb.ft

$M = \frac{w L^2}{8}$

$w L^2/8 = 2{,}436.50$ lb.ft

$\Rightarrow$ $w = 240.64$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **180.48** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = **105.40** psf

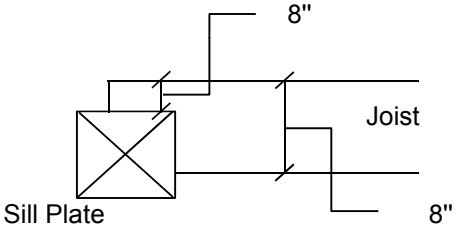
B) *SHEAR ANALYSIS*

SHEAR ADJUSTMENT FACTORS

F_v =	135	psi
C_M =	1.00	Wet service factor (Refer NDS Table 4A, Page #30)
C_t =	1.0	Temperature factor
C_i =	1.0	Incising factor
K_F =	2.88	Format Conversion Factor
Φ =	0.75	Resistance Factor
λ =	0.80	Time Effect Factor

$F'_v = F_v C_M C_t C_i K_F \Phi \lambda$

$= 233.28$ psi



Joist Width, b = 2"

Joist Depth, d = 8"

Depth of remaining at notch, d_n = 8"

$V'_r = \left[\frac{F'_v\, bd_n}{1.5}\right] \left[\frac{d_n}{d}\right]^2$ (NDS 3.4.3.2, Eq. 3.4-3)

$V'_r = 2488.320$ lb

$V = \frac{w L}{2}$

$w L/2 = 2488.320$ lb

$\Rightarrow$ $w = 552.96$ lb/ft

JOIST SPACING IS 16" O.C.

$\Rightarrow$ ULTIMATE TOTAL LOAD PER SQ. FT = **414.72** psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = **251.80** psf

C) *DEFLECTION ANALYSIS*

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

E = 1,100,000 psi
C_M = 1.00 Wet service factor (Refer NDS Table 4A, Page #30)
C_t = 1.0 Temperature factor
C_i = 1.0 Incising factor

$E' = E\, C_M\, C_t\, C_i$
= 1,100,000 psi

Joist Width, b = 2"
Joist Depth, d = 8"
Moment of Inertia, I_x = 85.333 in^4

Deflection, $\Delta = \frac{5\, w\, L^4}{384\, EI}$

Maximum allowable LL deflection, $\Delta_{LL} = \frac{L}{360}$
= 0.3000 inch

Maximum allowable total deflct, $\Delta_{TL} = \frac{L}{240}$
= 0.4500 inch

⇨ 0.30" = $\frac{5\, w\, L^4}{384\, EI}$

⇨ w_{LL} = 190.757 lb/ft
w_{TL} = 286.135 lb/ft

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w_{LL} = 190.75683 lb/ft
w_{TL} = 286.135 lb/ft

JOIST SPACING IS 16" O.C.

⇨ MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **143.07** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = **214.60** psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = **202.76** psf

Deflection for existing DL, Δ_{DL} = 0.025"
Deflection for existing DL, $\Delta_{DL} = \frac{L}{4348}$

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = **143.07** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 105.40 psf

STRUCTURAL ENGINEERING ASSOCIATES
1000 Walnut, Suite 1570
Kansas City, Missouri 64106
Phone: 816/421-1042
Fax: 816/421-1061

JOB 2017065-BAILEY
SHEET NO. ____ OF ____
CALCULATED BY PDS DATE 10/4/17
CHECKED BY ____ DATE ____
SCALE ____

3RD FLOOR FRAMING PLAN

SPAN OF EXISTING HEWN LOGS TO BE REDUCED TO ~8 FT

DEAD LOAD

LOGS:	2.5 PSF	
FLOORING:	1.0 PSF	
SUBFLOOR	3.0 PSF	
CEILING	1.0 PSF	
MISC.	5.0 PSF	(MECH, PLUMB, ELEC)
ADDL. JOIST	2.5 PSF	(EXISTING)
	15 PSF	15 × 8 = 120 PLF

LIVE LOAD

PER IBC 40 PSF 40 × 8 = 320 PLF

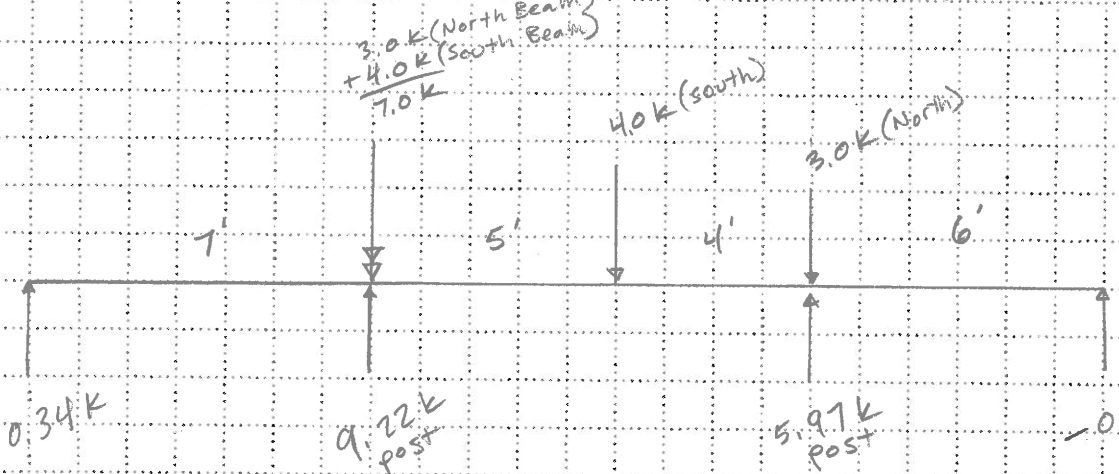
NEW BEAM NORTH SOUTH WITH 8FT(15 PSF + 40 PSF) = 440 PLF

PER RISA, W 6 × 15 WORKS FOR 13' SPAN, 8' TRIB

2.96 k REACTION

PER RISA, W8 × 21 WORKS FOR 17' SPAN, 8' TRIB

3.92 k REACTION



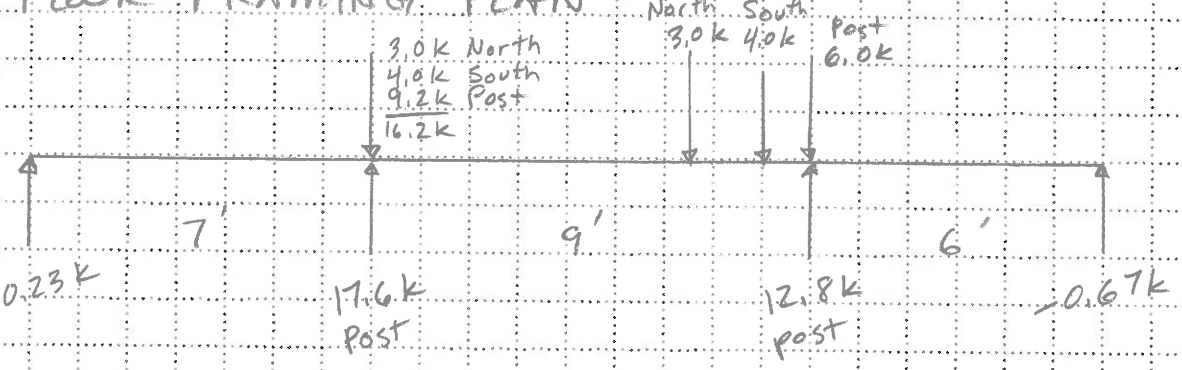
REACTIONS PER RISA WITH W6X15

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1000 Walnut, Suite 1570
Kansas City, Missouri 64106
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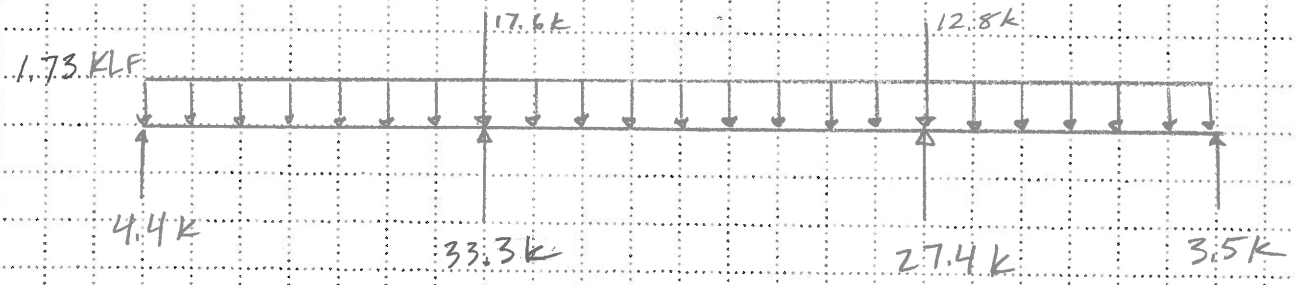
JOB 2017065-BAILLY
SHEET NO. ____ OF ____
CALCULATED BY PDS DATE 10/4/17
CHECKED BY ____ DATE ____
SCALE ____

2ND FLOOR FRAMING PLAN



REACTIONS PER RISA WITH W 6x15

1ST FLOOR FRAMING PLAN



TRIBUTARY WIDTH ≈ 15 FT

DEAD LOAD	15 PSF	225 PLF
LIVE LOAD	100 PSF	1500 PLF
		1725 PLF

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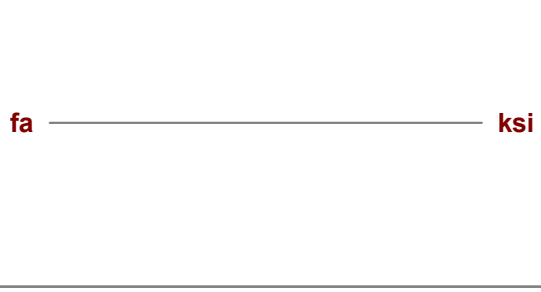
WARNING: Detail Report Based On Less Than 10 Sections!

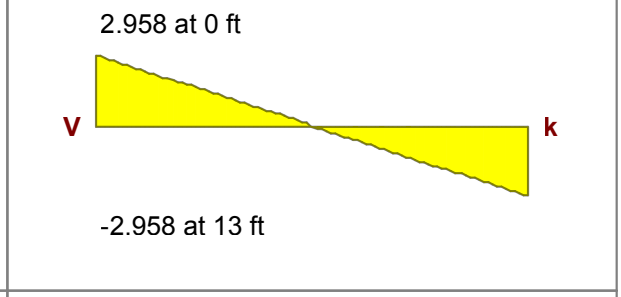
Typical North/South beam on north half of structure

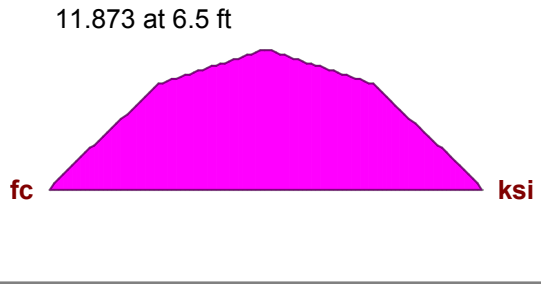
Beam: ***M1***

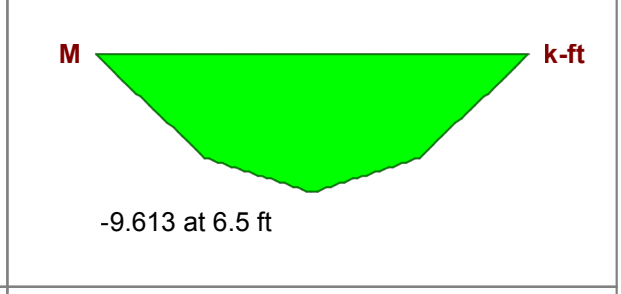
Shape: **W6x15**
Material: **A992**
Length: **13 ft**
I Joint: **N1**
J Joint: **N2**
LC 1: LC1
Code Check: **0.423 (bending)**
Report Based On 5 Sections

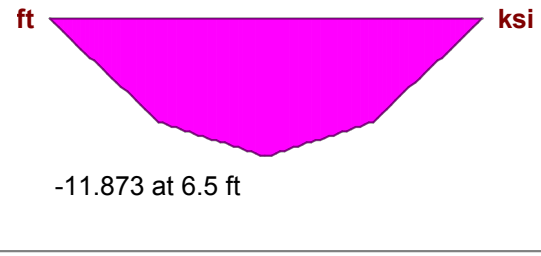


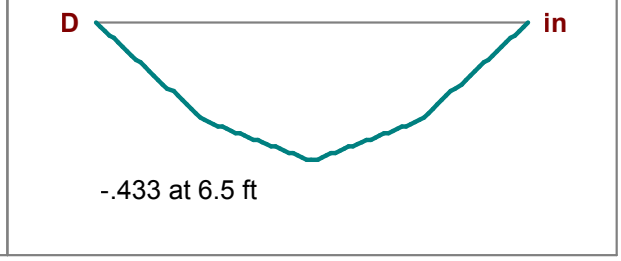












AISC 14th(360-10): ASD Code Check

Direct Analysis Method

Max Bending Check	**0.423**	Max Shear Check	**0.107**
Location	**6.5 ft**	Location	**0 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/360**
Bending Flange	**Non-Compact**	Compression Flange	**Non-Slender**
Bending Web	**Compact**	Compression Web	**Non-Slender**

Fy	**50 ksi**
Pnc/om	**56.93 k**
Pnt/om	**132.635 k**
Mn/om	**22.744 k-ft**
Vn/om	**27.554 k**
Cb	**1.136**

	Out Plane	In Plane
Lb	**13 ft**	**13 ft**
KL/r	**107.552**	**60.867**

L Comp Flange	**13 ft**
L-torque	**13 ft**
Tau_b	**1**

WARNING: Detail Report Based On Less Than 10 Sections!

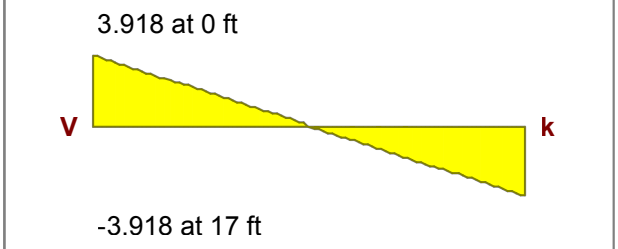
Typical North/South beam on south half of structure

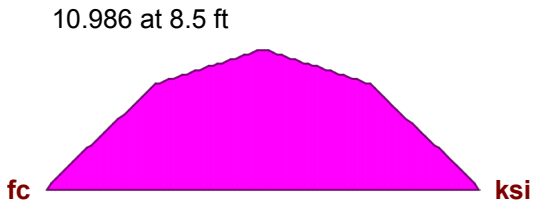
Beam: ***M1***

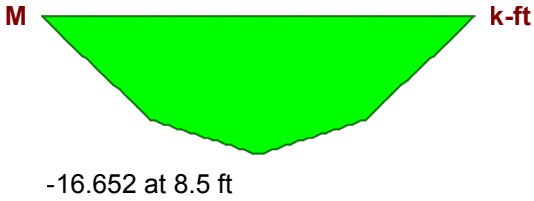
Shape: **W8x21**
Material: **A992**
Length: **17 ft**
I Joint: **N1**
J Joint: **N2**
LC 1: LC1
Code Check: **0.553 (bending)**
Report Based On 5 Sections

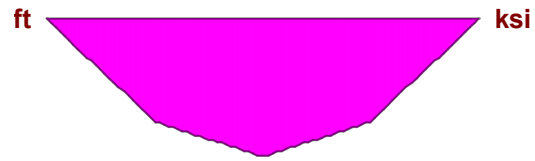


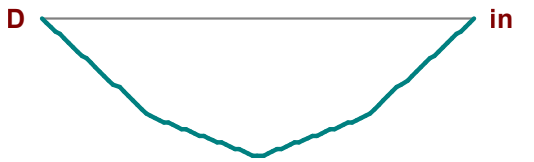












AISC 14th(360-10): ASD Code Check

Direct Analysis Method

Max Bending Check	**0.553**	Max Shear Check	**0.095**
Location	**8.5 ft**	Location	**0 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/411**
Bending Flange	**Compact**	Compression Flange	**Non-Slender**
Bending Web	**Compact**	Compression Web	**Non-Slender**

Fy	**50 ksi**
Pnc/om	**35.287 k**
Pnt/om	**184.431 k**
Mn/om	**30.112 k-ft**
Vn/om	**41.4 k**
Cb	**1.136**

	Out Plane	In Plane
Lb	**17 ft**	**17 ft**
KL/r	**161.984**	**58.348**

L Comp Flange	**17 ft**
L-torque	**17 ft**
Tau_b	**1**

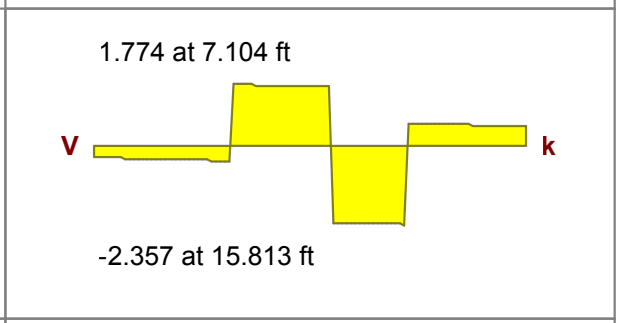
East/West beam at 3rd floor framing

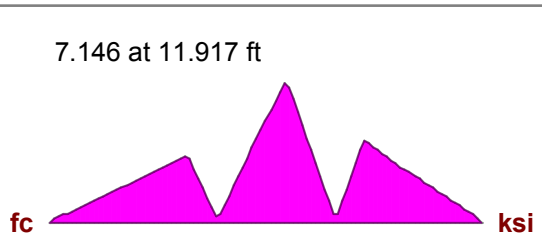
Beam: ***M1***

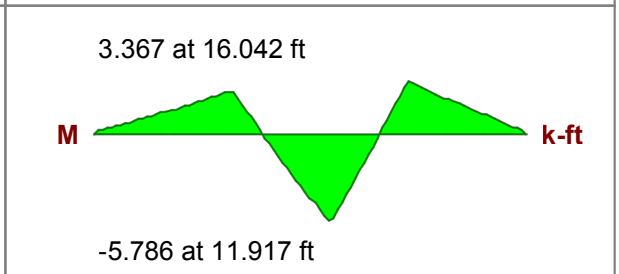
Shape: **W6x15**
Material: **A992**
Length: **22 ft**
I Joint: **N1**
J Joint: **N2**
LC 1: LC1
Code Check: **0.320 (bending)**
Report Based On 97 Sections

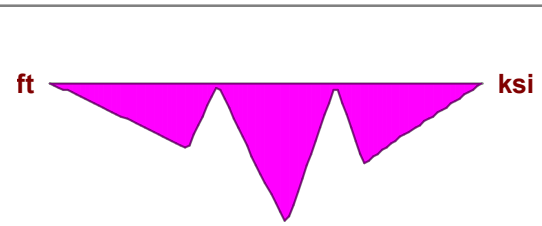


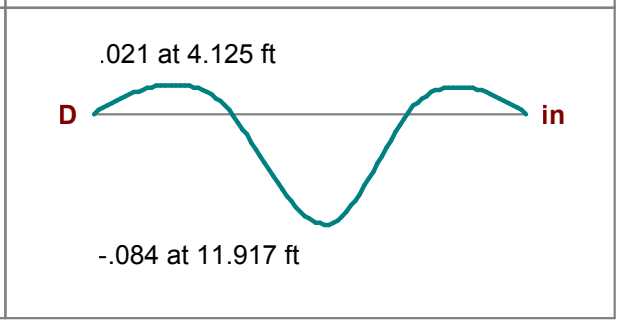












AISC 14th(360-10): ASD Code Check

Direct Analysis Method

Max Bending Check	**0.320**	Max Shear Check	**0.086**
Location	**11.917 ft**	Location	**15.813 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/3130**
Bending Flange	**Non-Compact**	Compression Flange	**Non-Slender**
Bending Web	**Compact**	Compression Web	**Non-Slender**

Fy	**50 ksi**
Pnc/om	**20.1 k**
Pnt/om	**132.635 k**
Mn/om	**18.061 k-ft**
Vn/om	**27.554 k**
Cb	**1.541**

	Out Plane	In Plane
Lb	**22 ft**	**22 ft**
KL/r	**182.011**	**103.005**

L Comp Flange	**22 ft**
L-torque	**22 ft**
Tau_b	**1**

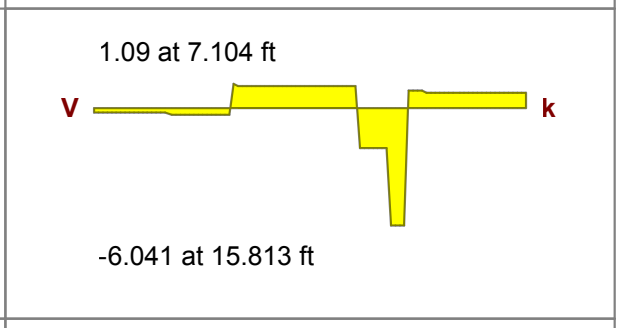
East/West beam at 2nd floor framing

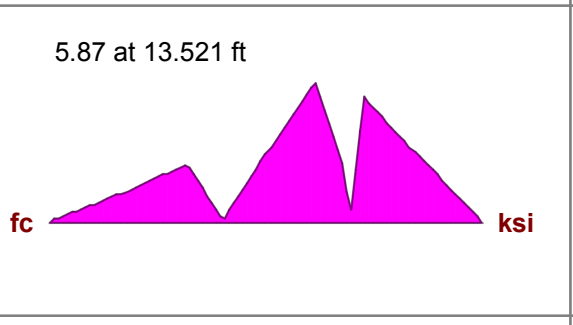
Beam: ***M1***

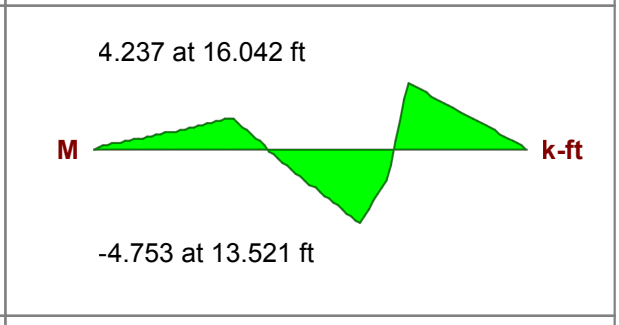
Shape: **W6x15**
Material: **A992**
Length: **22 ft**
I Joint: **N1**
J Joint: **N2**
LC 1: LC1
Code Check: **0.253 (bending)**
Report Based On 97 Sections

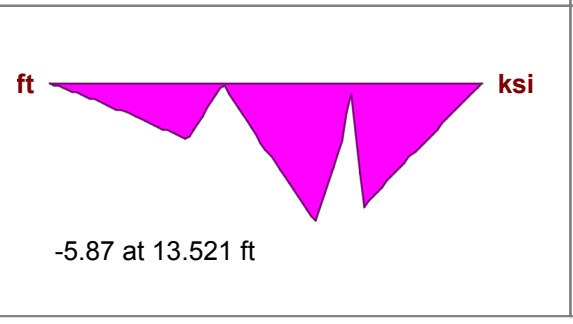


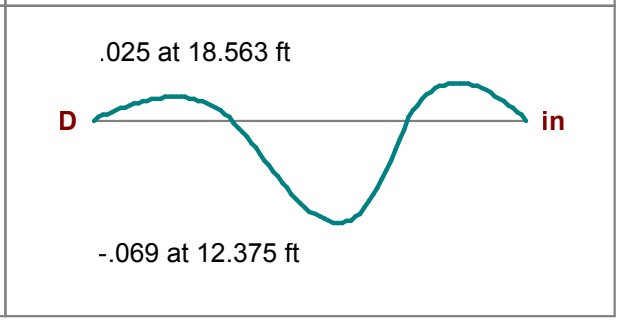












AISC 14th(360-10): ASD Code Check

Direct Analysis Method

Max Bending Check	**0.253**	Max Shear Check	**0.219**
Location	**13.521 ft**	Location	**15.813 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/3800**
Bending Flange	**Non-Compact**	Compression Flange	**Non-Slender**
Bending Web	**Compact**	Compression Web	**Non-Slender**

Fy	**50 ksi**
Pnc/om	**20.1 k**
Pnt/om	**132.635 k**
Mn/om	**18.771 k-ft**
Vn/om	**27.554 k**
Cb	**1.601**

	Out Plane	In Plane
Lb	**22 ft**	**22 ft**
KL/r	**182.011**	**103.005**

L Comp Flange	**22 ft**
L-torque	**22 ft**
Tau_b	**1**

WARNING: Detail Report Based On Less Than 10 Sections!

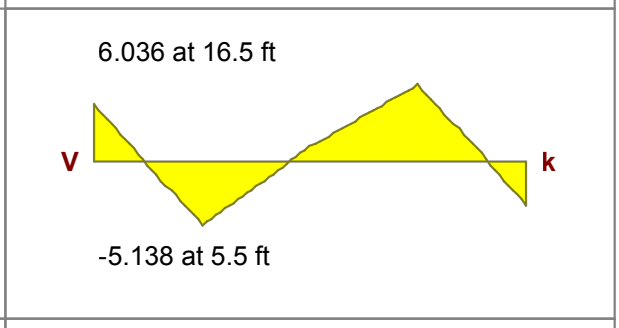
East/West beam at 1st floor framing

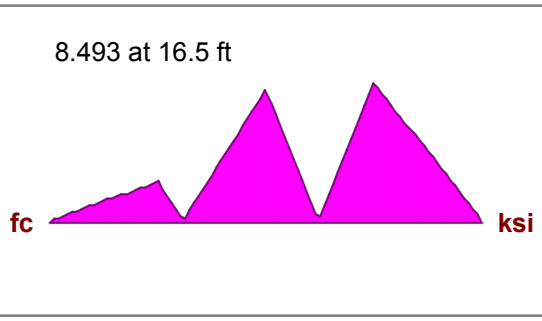
Beam: ***M1***

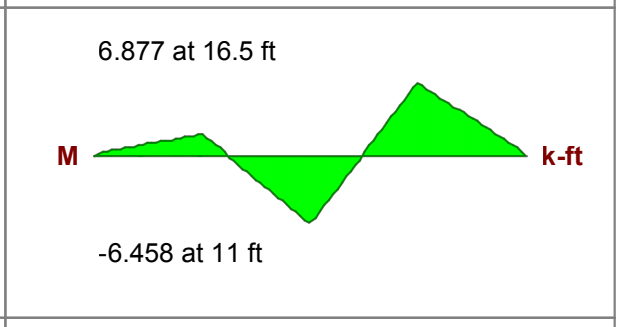
Shape: **W6x15**
Material: **A36 Gr.36**
Length: **22 ft**
I Joint: **N1**
J Joint: **N2**
LC 1: LC1
Code Check: **0.565 (bending)**
Report Based On 5 Sections

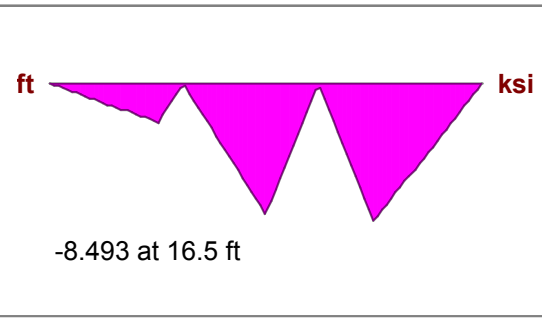


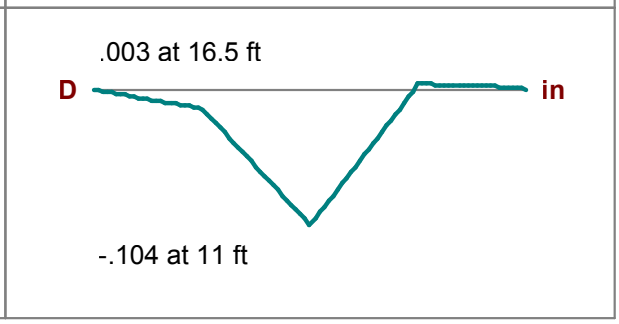












AISC 14th(360-10): ASD Code Check

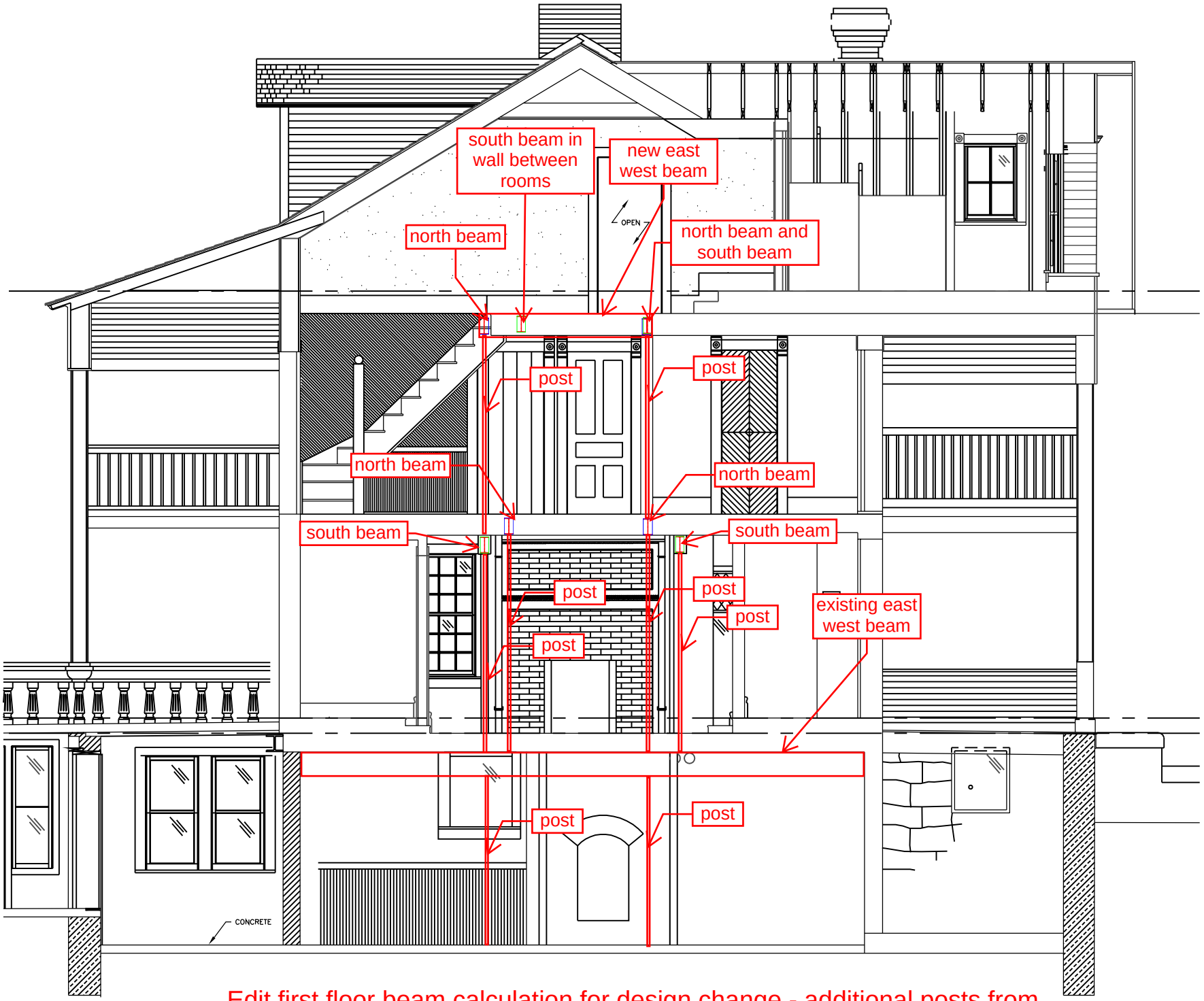
Direct Analysis Method

Max Bending Check	**0.565**	Max Shear Check	**0.394**
Location	**7.104 ft**	Location	**7.104 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/2534**
Bending Flange	**Non-Compact**	Compression Flange	**Non-Slender**
Bending Web	**Compact**	Compression Web	**Non-Slender**

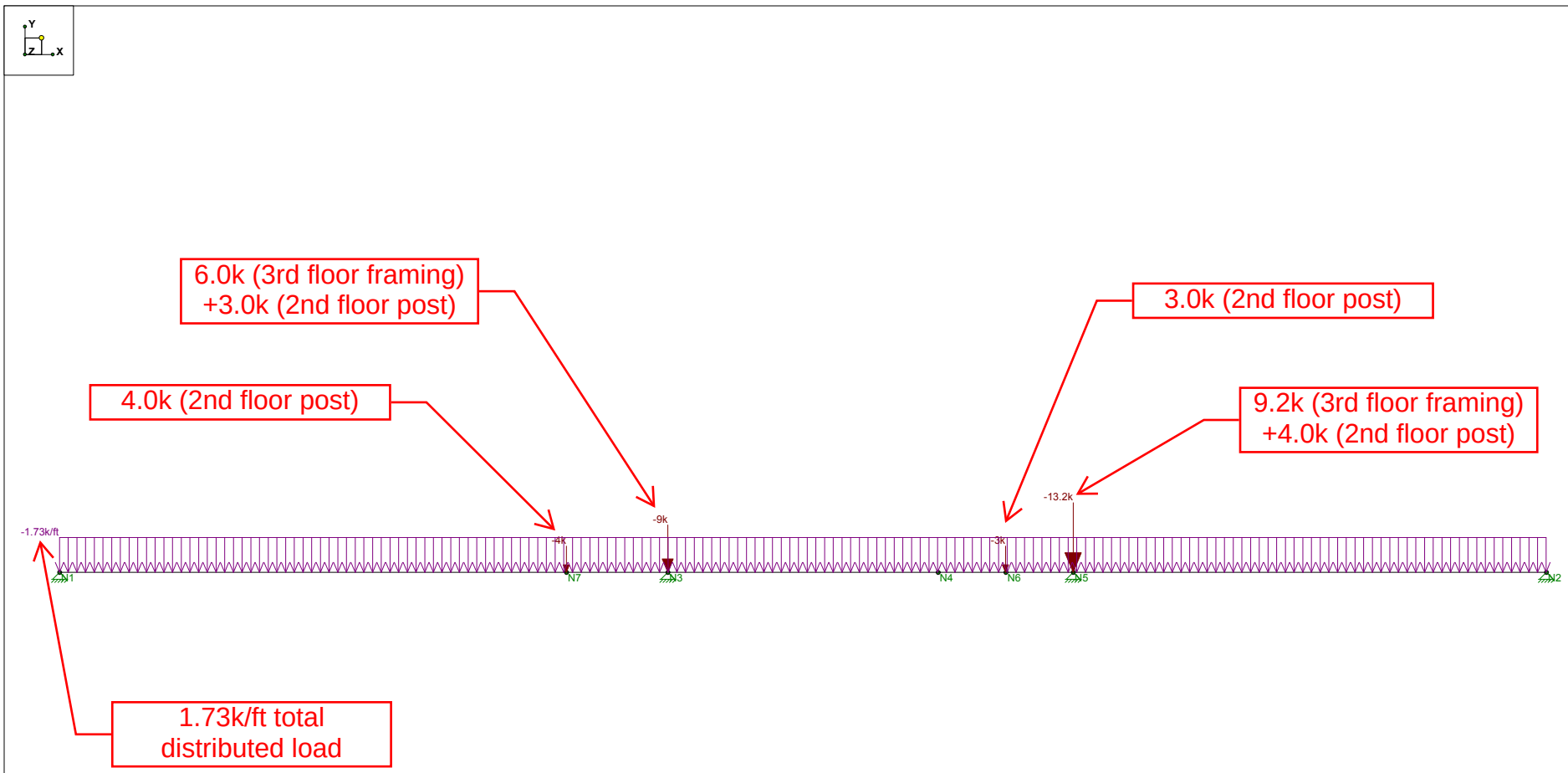
Fy	**36 ksi**
Pnc/om	**20.1 k**
Pnt/om	**95.497 k**
Mn/om	**19.102 k-ft**
Vn/om	**19.839 k**
Cb	**1.701**

	Out Plane	In Plane
Lb	**22 ft**	**22 ft**
KL/r	**182.011**	**103.005**

L Comp Flange	**22 ft**
L-torque	**22 ft**
Tau_b	**1**



Edit first floor beam calculation for design change - additional posts from 2nd floor framing rather than a transfer beam at the 2nd floor level.



Edit first floor beam calculation for design change - additional posts from 2nd floor framing rather than a transfer beam at the 2nd floor level.
Note - loading diagram is reverse of schematic drawing.

Loads: BLC 1,
Results for LC 1, LC1

Structural Engineering Associates, I..		SK - 1
Philip Steed, PE		May 25, 2018 at 2:46 PM
		1st Floor East West Beam 2018.05.24.r2d

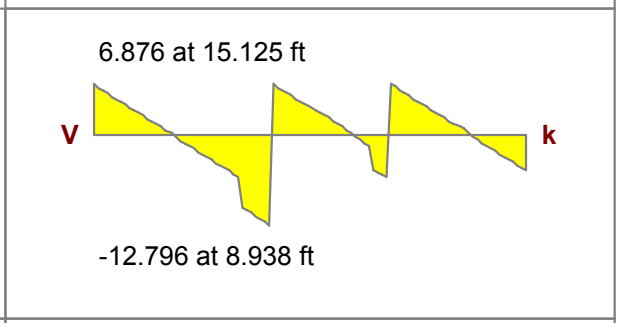
Revised East/West beam at 1st floor framing

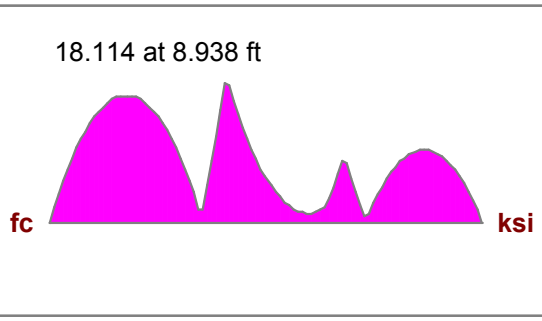
Beam: ***M1***

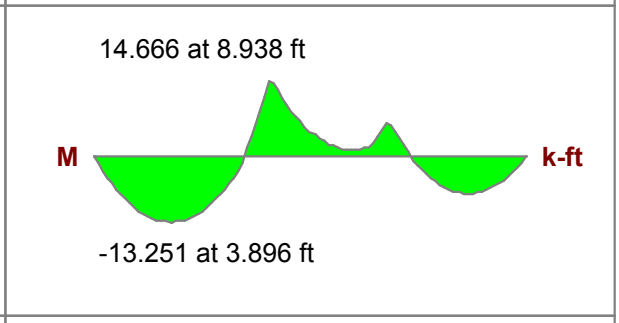
Shape: **W6x15**
Material: **A36 Gr.36**
Length: **22 ft**
I Joint: **N1**
J Joint: **N2**
LC 1: LC1
Code Check: **0.768 (bending)**
Report Based On 97 Sections

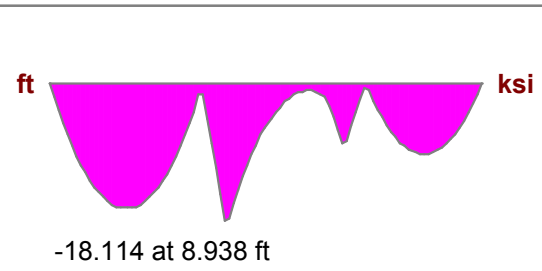


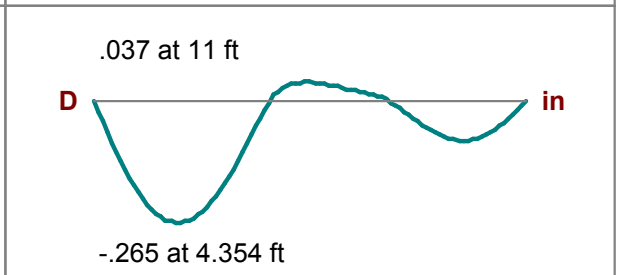












AISC 14th(360-10): ASD Code Check

Direct Analysis Method

Max Bending Check	**0.768**	Max Shear Check	**0.645**
Location	**8.938 ft**	Location	**8.938 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/996**
Bending Flange	**Non-Compact**	Compression Flange	**Non-Slender**
Bending Web	**Compact**	Compression Web	**Non-Slender**

Fy	**36 ksi**
Pnc/om	**20.1 k**
Pnt/om	**95.497 k**
Mn/om	**19.102 k-ft**
Vn/om	**19.839 k**
Cb	**1.96**

	Out Plane	In Plane
Lb	**22 ft**	**22 ft**
KL/r	**182.011**	**103.005**

L Comp Flange	**22 ft**
L-torque	**22 ft**
Tau_b	**1**

01: Main House - First Floor			
Member Name	**Results**	**Current Solution**	**Comments**
11 ft span	Passed	1 Piece(s) 2 x 8 Douglas Fir-Larch No. 2 @ 16" OC	
16 ft span	Passed	1 Piece(s) 3 1/2" x 8" 2.0E Parallam® PSL @ 16" OC	
Post	Passed	1 Piece(s) 3 1/2" x 3 1/2" 1.3E TimberStrand® LSL	
02: Main House - Second Level			
Member Name	**Results**	**Current Solution**	**Comments**
New Joist - Room 201	Passed	1 Piece(s) 2 x 8 Hem-Fir No. 2 @ 19.2" OC	

Forte Software Operator	Job Notes
Philip Steed Structural Engineering Associates (816) 421-1042 psteed@seassociates.com	

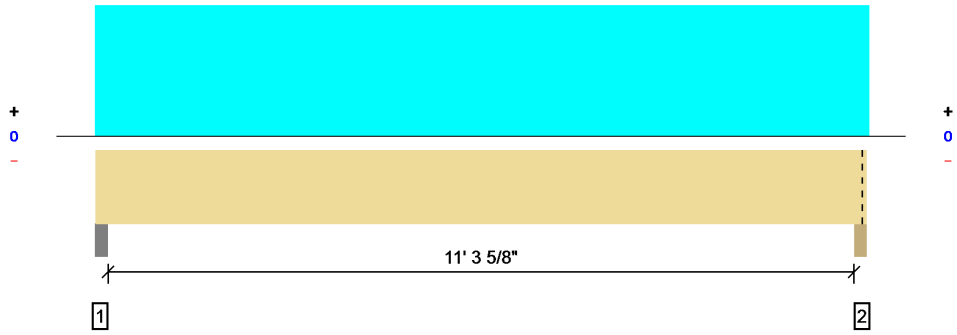
FORTE®

MEMBER REPORT *Main House - First Floor, 11 ft span*

PASSED

1 piece(s) 2 x 8 Douglas Fir-Larch No. 2 @ 16" OC

Overall Length: 11' 10 5/8"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	329 @ 11' 8 1/8"	2231 (3.50")	Passed (15%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	279 @ 10 3/4"	1305	Passed (21%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	909 @ 5' 11 5/16"	1360	Passed (67%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.255 @ 5' 11 5/16"	0.382	Passed (L/539)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.282 @ 5' 11 5/16"	0.573	Passed (L/487)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	--	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 11' 11" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 11' 11" o/c unless detailed otherwise.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Pocket in masonry - concrete	3.50"	3.50"	1.50"	32	297	329	None
2 - Beam - SPF	3.50"	3.50"	1.50"	32	297	329	Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 11' 10 5/8"	16"	4.0	37.5	Public rooms and corridors serving them

Member Notes

Additional joists needed north of existing W6 beam. Existing joists will work for 100 psf if spaced at 10" o.c. but they are currently spaced at 16" o.c.
Check additional joists for 37.5 psf at 16" o.c.

Weyerhaeuser Notes

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
Philip Steed Structural Engineering Associates (816) 421-1042 psteed@seassociates.com	

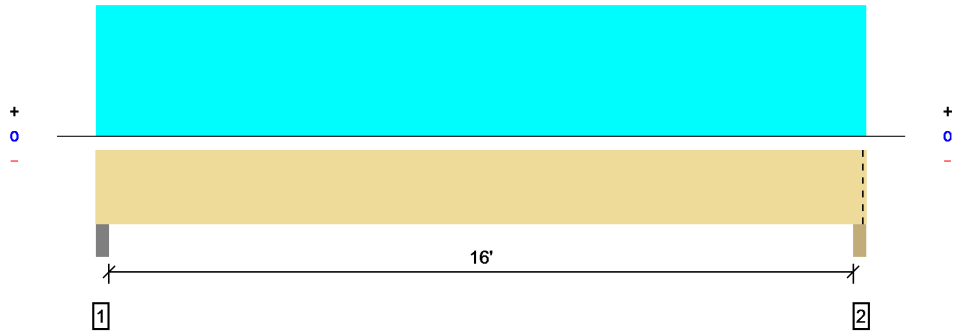
FORTE®

MEMBER REPORT *Main House - First Floor, 16 ft span*

PASSED

1 piece(s) 3 1/2" x 8" 2.0E Parallam® PSL @ 16" OC

Overall Length: 16' 7"



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	907 @ 16' 4 1/2"	5206 (3.50")	Passed (17%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	802 @ 11 1/2"	5413	Passed (15%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3572 @ 8' 3 1/2"	9815	Passed (36%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.488 @ 8' 3 1/2"	0.539	Passed (L/397)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.534 @ 8' 3 1/2"	0.808	Passed (L/363)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	45	Any	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 16' 7" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 16' 7" o/c unless detailed otherwise.
- A 4% increase in the moment capacity has been added to account for repetitive member usage.
- Resawn products must maintain manufacturing stamps.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 19/32" Panel (20" Span Rating) that is nailed down.
- Additional considerations for the TJ-Pro™ Rating include: 1/2" Gypsum ceiling, bridging or blocking at max. 8' o.c..

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Pocket in masonry - concrete	3.50"	3.50"	1.50"	77	829	906	None
2 - Beam - SPF	3.50"	3.50"	1.50"	77	829	906	Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 16' 7"	16"	7.0	75.0	Residential - Living Areas

Member Notes

Additional joists needed south of existing W6 beam. Existing joists will work for 100 psf if spaced at 4" o.c. but they are currently spaced at 16" o.c.
Check additional joists for 75 psf at 16" o.c.

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

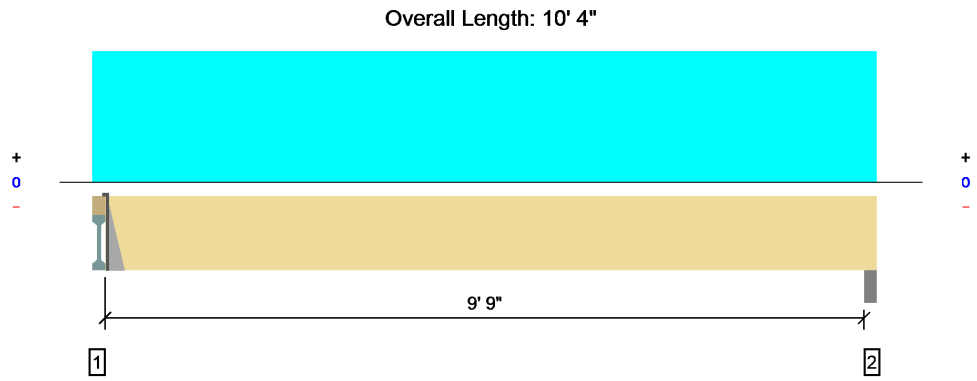
SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
Philip Steed Structural Engineering Associates (816) 421-1042 psteed@seassociates.com	

MEMBER REPORT *Main House - Second Level, New Joist - Room 201*

PASSED

1 piece(s) 2 x 8 Hem-Fir No. 2 @ 19.2" OC



All locations are measured from the outside face of left support (or left cantilever end).All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	409 @ 3 1/2"	911 (1.50")	Passed (45%)	--	1.0 D + 1.0 L (All Spans)
Shear (lbs)	359 @ 10 3/4"	1088	Passed (33%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	1006 @ 5' 2 1/2"	1284	Passed (78%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.217 @ 5' 2 1/2"	0.328	Passed (L/543)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.283 @ 5' 2 1/2"	0.492	Passed (L/417)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	N/A	N/A	--	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2015
Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 8' 9" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 10' 1" o/c unless detailed otherwise.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Hanger on Single 2X SPF plate	3.50"	Hanger[1]	1.50"	100	333	433	See note [1]
2 - Pocket in masonry - concrete	3.50"	3.50"	1.50"	98	328	426	None

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- [1] See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie Connectors						
Support	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
1 - Top Mount Hanger	LBV1.56X (H1= 7.25)	3.00"	6-10d x 1-1/2	4-10d x 1-1/2	2-10d x 1-1/2	

Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 10' 4"	19.2"	12.0	40.0	Residential - Living Areas

Member Notes

Design additional members between existing exposed beams in Room 201.

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

SUSTAINABLE FORESTRY INITIATIVE

Forte Software Operator	Job Notes
Philip Steed Structural Engineering Associates (816) 421-1042 psteed@seassociates.com	

FORTE®

MEMBER REPORT *Main House - First Floor, Post*

PASSED

1 piece(s) 3 1/2" x 3 1/2" 1.3E TimberStrand® LSL

Post Height: 8' 6"



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	29	50	Passed (58%)	--	--
Compression (lbs)	3740	7463	Passed (50%)	1.00	1.0 D + 1.0 L
Base Bearing (lbs)	3740	396900	Passed (1%)	--	1.0 D + 1.0 L
Bending/Compression	0.59	1	Passed (59%)	1.00	1.0 D + 1.0 L

- Axial load eccentricity for this design is 1/6 of applicable member side dimension.
- Applicable calculations are based on NDS.

Supports	Type	Material
Base	Plate	Steel

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Member Type : Free Standing Post

Building Code : IBC 2015

Design Methodology : ASD

Drawing is Conceptual

Vertical Load	Dead (0.90)	Floor Live (1.00)	Comments
1 - Point (lb)	660	3080	

Member Notes

Design replacement post for framing around stairs at basement to first level.
Dead Load is 5.5 ft x 4 ft x (15 psf +15 psf) = 660 lb
Live Load is 5.5 ft x 4 ft x (100 psf +40 psf) = 3080 lb

Weyerhaeuser Notes

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator

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Philip Steed Structural Engineering Associates (816) 421-1042 psteed@seassociates.com	

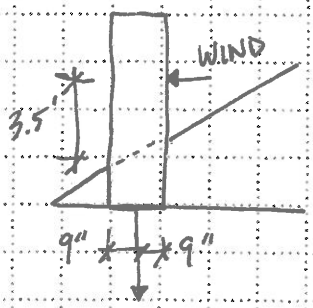
STRUCTURAL ENGINEERING ASSOCIATES
1000 Walnut, Suite 1570
Kansas City, Missouri 64106
Phone: 816/421-1042
Fax: 816/421-1061

JOB 2017065 - BAILLY
SHEET NO. _____ OF _____
CALCULATED BY PDS DATE 10/3/17
CHECKED BY _____ DATE _____
SCALE _____

CHECK BRICK CHIMNEY ON BRICK HOUSE FOR TIPPING IN WIND

5 FT (1.25 FT) = 6.25 FT^2 AREA SUBJ. TO WIND

120 PCF x 1.25 FT x 1.25 FT x 6.5 FT = 1219 LBS DEAD LOAD



$$\frac{1219\ LB\ (0.75\ FT)}{3.5\ FT} = \frac{261\ LB}{6.25\ FT^2} = 41.8\ PSF\ WIND$$

FOR 48 PSF WIND, BACK CALCULATE FORCE REQUIRED ON 3 LAG BOLTS

48 PSF (6.25 FT)(3.5 FT) WIND

− 1219 LB (0.75 FT) DL

= 3 LAG BOLTS (1.5 FT) x LB

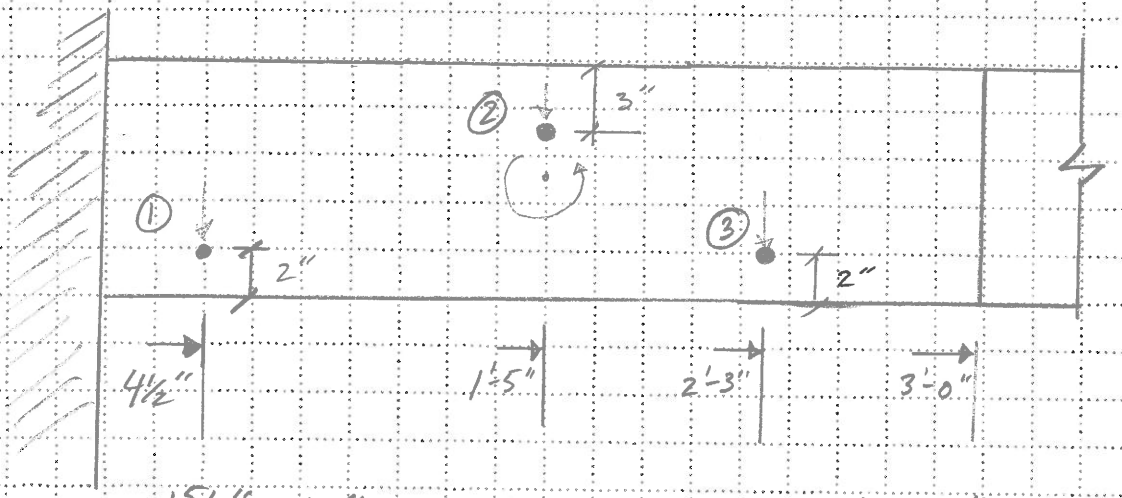
→ REQ LOAD PER BOLT = 30 LB OK

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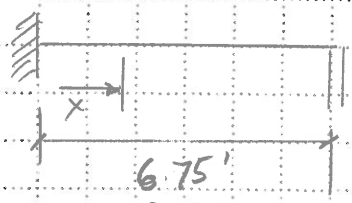
JOB 2017065 - BAILLY
SHEET NO. ____ OF ____
CALCULATED BY PDS DATE 10/9/17
CHECKED BY ____ DATE ____
SCALE ____

CHECK JOIST SPLICE FOR BRICK HOUSE



1⅝" x 10" SPLICE BOARD WITH (3) ½" ∅ ALL THREAD
ASSUME EASTERN WHITE PINE, No. 2

FROM EXISTING FLOOR JOIST CAPACITY CALCULATION
DL = 10 PSF
LL = 65 PSF
} 16" O.C. SPACING = 100 PLF



FIND SHEAR & MOMENT @ x = 1.5'
SIMPLY SUPPORTED

$V = w\left(\frac{l}{2} - x\right) = 100\,PLF\left(\frac{6.75}{2} - 1.5\right) = 187.5\ LB$

$M = \frac{wx}{2}(l - x) = \frac{100\,PLF(1.5)}{2}(6.75 - 1.5) = 394\ LB \cdot FT$

FROM TABLE 11A, NDS, FOR G = 0.36 $Z_{11} = 410$ LBS $Z_{\perp} = 160$ LBS

$M_1 + M_2 + M_3 = \frac{160\,LBS(1'\text{-}5" - 4\frac{1}{2}")}{12"/FT} + \frac{410\,LBS(2")}{12"/FT} + \frac{160\,LBS(2'\text{-}3" - 1'\text{-}5")}{12"/FT}$

$= 166\ LB \cdot FT + 68.3\ LB \cdot FT + 133.3\ LB\ FT$

$= 368\ LB \cdot FT < 394\ LB \cdot FT$ NG

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Two-Story Log House, log detail. (STRATA 2017)

F MATERIAL ANALYSIS
WOOD SPECIES TESTING

Regis B. Miller, PhD
EIN: 20-5521373

Information Specialist
Wood Identification and Tropical Woods
23 Mountain Ash Trail
Madison, Wisconsin 53717-1508
Phone: (608) 833-4121
Email: rmiller1@wisc.edu

July 24, 2017

Philip D. Steed, PE
Structural Engineering Associates, INC.
1000 Walnut, Suite 1750
Kansas City, MO 64106

Dear Mr. Steed,

I received your letter and specimens reportedly taken from Bailly Homestead in the Indiana Dunes National Lakeshore. The seven wood specimens that you submitted for identification have been identified as follows:

1. HS-18 Main House, Northwest Post……redwood (*Sequoia* mostly likely *S. sempervirens*)
2. HS-18 Main House, First Floor Joist.....white pine (*Pinus*, mostly likely *P. strobus*)
3. HS-18 Main House, Hewn Beam, Second Floor Ceiling, SE Room .....species in the white oak group (*Quercus*)
4. HS-18 Main House, Roof Framing, Older (sample charred)……..red pine (*Pinus*, mostly like *P. resinosa)*
5. HS-18 Main House, Roof Framing, Newer……..western yellow pine (*Pinus*, mostly likely *P. ponderosa*)
6. HS-19 Two-Story Brick, North Portion Ground Floor Joist ….white pine (*Pinus*, mostly likely *P. strobus*)
7. HS-19 Two-Story Brick, South Portion Ground Floor Joist (sample with pin holes due to insects)……eastern hemlock (*Tsuga canadensis*)

I examined each of the specimens with a 14X hand lens and light microscope at various magnifications. Initially I smooth the transverse surface of the specimens with a microtome, razor blade or utility knife. I examine the surface with the hand lens, observed several features, and oriented the pieces to cut thin sections from the radial and tangential surfaces. The thin sections were placed on a glass slide, a few drops of glycerine/alcohol solution added, and covered with a cover slip. The slide was placed on a hot plate and brought to a boil to remove the air from the cells. The hand sections were observed under a light microscope. After observing various features with the naked eye, hand lens and light microscope, I identified the specimens.

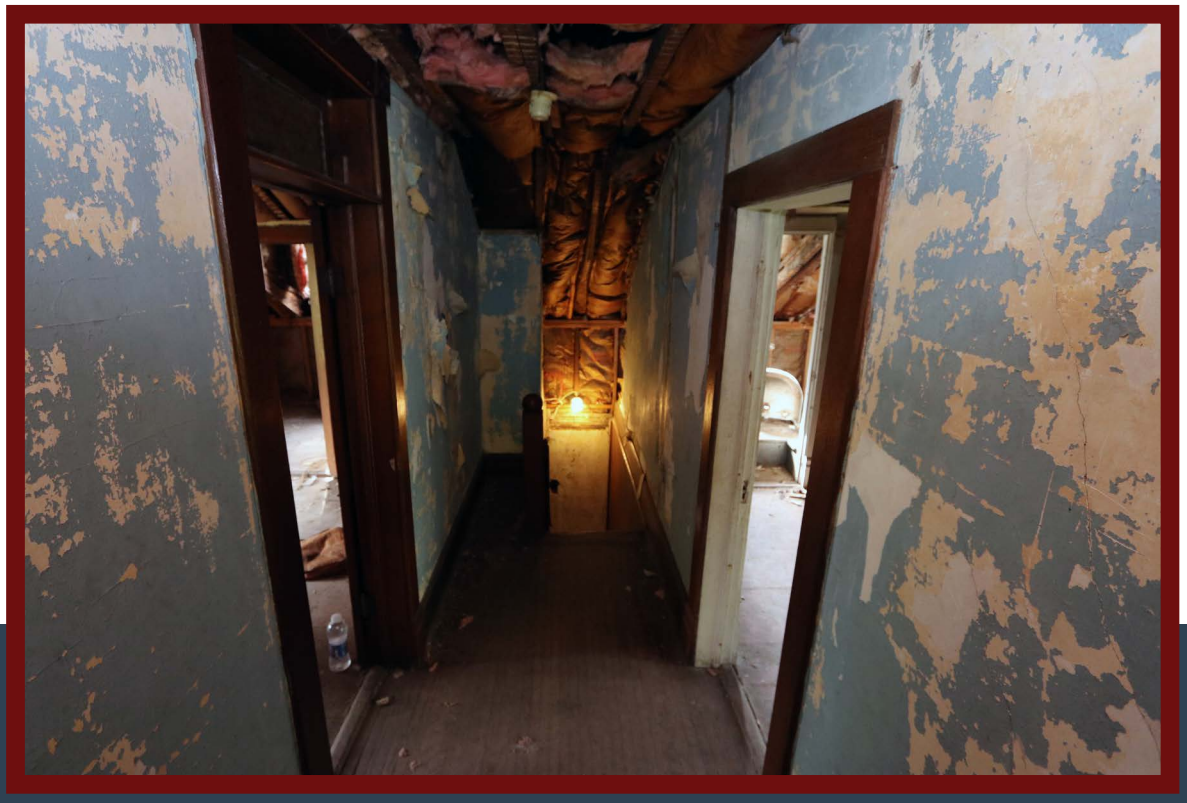
Best regards,

Best regards.

/s/ *Regis B. Miller*

Regis B. Miller, Ph.D.
Wood Identification & Information Specialist
23 Mountain Ash Trail
Madison, WI 53717-1508

Phone: 608-833-4121
Mobile: 608-213-3217
Email: rmiller1@wisc.edu



Main House Hall 300. (STRATA 2017)

G ASBESTOS AND LEAD-BASED PAINT SURVEY REPORT

Asbestos and Lead-Based Paint Survey Report

Bailly Homestead

Indiana Dunes National Lakeshore

Main House (HS-18) and Brick Home (HS-19)

Porter, Indiana

August 25, 2017

Terracon Project No. 11177119





Prepared for:

STRATA Architecture + Preservation

Kansas City, Missouri

Prepared by:

Terracon Consultants, Inc.

Naperville, Illinois

August 25, 2017

STRATA Architecture + Preservation
1701 Oak Street, Suite 100
Kansas City, Missouri 64108

Attn: Ms. Angie Geist Gaebler, AIA
Principal
P: (816) 474-0900
E: angie@strata-arch.com

Re: Asbestos and Lead-Based Paint Survey Report
Main House (HS-18) and Brick House (HS-19)
Bailly Homestead
Indiana Dunes National Lakeshore
Porter, Indiana
NPS IDQ # P14PC00446 / Project # P17PD00598
Terracon Project No. 11177119

Dear Ms. Gaebler:

Terracon Consultants, Inc. (Terracon) is pleased to submit the attached Asbestos and Lead-Based Paint Survey report for the above-referenced site. The services were conducted in general accordance with Terracon Proposal No. P11177119 dated March 28, 2017.

Based on sampling and analysis performed for this survey, the presence of asbestos-containing materials (ACM), lead-based paint (LBP) and lead in soil were identified. Pease refer to the attached report for details.

Terracon appreciates the opportunity to provide this service to STRATA Architecture + Preservation. If you have any questions regarding this report, or if you need further environmental consulting assistance during the redevelopment of this property, please contact our office.

Sincerely,
Terracon Consultants, Inc.

Heather E. Eckard
Senior Staff Industrial Hygienist

Brendan J. Quealy
Senior Associate
Group Manager- IH/Asbestos Services

TABLE OF CONTENTS

Page No.

1.0 INTRODUCTION 1
1.1 Project Objective 1
1.2 Reliance 2
2.0 SITE DESCRIPTION 2
3.0 FIELD ACTIVITIES - ASBESTOS 2
3.1 Visual Assessment 2
3.2 Physical Assessment 3
3.3 Sample Collection 3
3.4 Sample Analysis 3
3.5 Regulatory Overview 3
4.0 FIELD ACTIVITIES - LEAD 4
4.1 Visual Assessment 5
4.2 XRF Testing 5
4.3 Paint Chip Sample Collection 5
4.5 Lead in Soil Sample Collection 5
4.4 Sample Analysis 5
4.5 Regulatory Overview 6
5.0 FINDINGS AND RECOMMENDATIONS 7
5.1 ACM Findings and Recommendations 7
5.2 Lead Paint Findings and Recommendations 9
5.2 Lead in Soil Findings and Recommendations 12
6.0 LIMITATIONS/GENERAL COMMENTS 13

APPENDICES

Appendix A **CONFIRMED ASBESTOS-CONTAINING MATERIALS**

Appendix B **ASBESTOS SURVEY SAMPLE SUMMARY**

Appendix C **ASBESTOS LABORATORY ANALYTICAL REPORT(S)**

Appendix D **LEAD PAINT XRF SUMMARY AND LABORATORY RESULTS**

Appendix E **XRF PERFORMANCE CHARACTERISTICS SHEETS**

Appendix F **LEAD SOIL LABORATORY ANALYTICAL REPORT(S)**

Appendix G **PERSONNNEL & LABORATORY LICENSES/CERTIFICATIONS**

ASBESTOS AND LEAD-BASED PAINT SURVEY REPORT
MAIN HOUSE (HS-18) AND BRICK HOUSE (HS-19)
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA
NPS IDIQ # P14PC00446 / PROJECT # P17PD00598

TERRACON PROJECT NO. 11177119

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) conducted an asbestos-containing materials (ACM), lead paint and lead in soil survey of the Bailly Homestead Main House (HS-18) and the Brick House (HS-19) located at the Indiana Dunes National Lakeshore, Porter, Indiana (the site). The survey was conducted on June 14, 2017 in general accordance with Terracon Proposal No. P11177119 dated March 28, 2017.

Interior and exterior building components were surveyed and homogeneous areas of suspect ACM were visually identified and documented. Although reasonable effort was made to survey accessible suspect materials, additional suspect but unsampled materials could be located in walls, in voids, or in other concealed areas. Suspect ACM samples were collected in general accordance with the sampling protocols outlined in United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) 763.86. Samples were delivered to an accredited laboratory for analysis by polarized light microscopy (PLM).

In conjunction with the asbestos survey, Terracon conducted a lead paint survey where building components were inspected and unique sampling combinations of paint were visually identified and documented. This survey was not intended to meet the requirements of the US Department of Housing and Urban Development (HUD) Guidelines. Although reasonable effort was made to inspect the substrates for unique painting combinations, additional suspect but untested paint could be located at the site due to an undetected change in the paints or variations in lead concentrations in homogeneous paint combinations.

Terracon also conducted lead in soil sampling from bare soil in the dripline/foundation area of the buildings.

1.1 Project Objective

Terracon understands this survey was requested due to possible renovation in the future. USEPA regulation 40 CFR 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP), prohibits the release of asbestos fibers to the atmosphere during demolition or renovation activities. The asbestos NESHAP requires that potentially regulated ACM be identified, classified, and quantified prior to demolition or renovation activities.

1.2 Reliance

This report is for the exclusive use of STRATA Architecture + Preservation for the project being discussed. Reliance by any other party on this report is prohibited without written authorization of Terracon and STRATA Architecture + Preservation. Reliance on this report by STRATA Architecture + Preservation and all authorized parties will be subject to the terms, conditions, and limitations stated in the Agreement for Services, this report, and the Reliance Agreement. The limitations of liability defined in the Agreement for Services is the aggregate limit of Terracon's liability to STRATA Architecture + Preservation.

2.0 SITE DESCRIPTION

The site is located at the Indiana Dunes National Lakeshore, Porter, Indiana and consists of two vacant residential structures as further described below.

- **Main House (HS-18):** The house is a three-and one-half story structure topped with a gabled roof that dates to around 1834.
- **Brick House (HS-19)** The two-story Brick House has an overall footprint of 16-feet by 33-feet with just over 1,500 square feet of interior area and was built around 1874. The primary gable and addition hipped roofs are covered by wood shingles.

3.0 FIELD ACTIVITIES - ASBESTOS

The ACM survey was conducted by Mr. Joseph T. Keca, a State of Indiana licensed asbestos inspector (license number 19A005978). A copy of the asbestos inspector license is attached in Appendix G. The survey was conducted in general accordance with the sample collection protocols established in USEPA 40 CFR 763.86.

3.1 Visual Assessment

The survey activities began with visual observation of the interior and exterior of the site buildings to identify homogeneous areas of materials suspected of containing asbestos (suspect ACM). A homogeneous area consists of materials that appear similar throughout in terms of color and texture with consideration given to the date of application. Materials identified as concrete, glass, wood, masonry, metal, or rubber were not considered suspect ACM. Homogeneous areas of suspect ACM were visually identified and documented. Although reasonable effort was made to survey accessible suspect materials, additional suspect, but unsampled, materials could be located in walls, voids or in other concealed areas.

3.2 Physical Assessment

A physical assessment of each homogeneous area of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the USEPA as a material which can be crumbled, pulverized or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

3.3 Sample Collection

Based on results of the visual assessment, bulk samples of suspect ACM were collected in general accordance with USEPA sampling protocols. Random samples of suspect materials were collected in each homogeneous area. Bulk samples were collected using wet methods as applicable to reduce the potential for fiber release. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker.

Terracon collected 104 bulk samples from 28 homogeneous areas of suspect ACM. A summary of suspect ACM samples collected during the survey is included as Appendix B.

3.4 Sample Analysis

Bulk samples were submitted under chain of custody (COC) to Steve Moody Micro Services, LLC (SMMS) of Farmers Branch, Texas and STAT Analysis Corporation (STAT), Chicago, Illinois for analysis by PLM with dispersion staining techniques in accordance with USEPA's Method for the Determination of Asbestos in Bulk Building Materials (600/R-93-116). The percentage of asbestos, where applicable, was determined by microscopic visual estimation. SMMS and STAT are accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) Accreditation No. 200721-0 and 101202-0, respectively. A copy their accreditations are included in Appendix G. The percentage of asbestos, where applicable, was determined by microscopic visual estimation.

Laboratory analytical reports are included in Appendix C.

3.5 Regulatory Overview

The asbestos NESHAP (40 CFR Part 61, Subpart M) regulates asbestos fiber emissions and asbestos waste disposal practices. It also requires the identification and classification of suspect materials prior to demolition or renovation activity. Under NESHAP, ACM are classified as either friable, Category I nonfriable, or Category II nonfriable ACM. Friable materials are those that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure. Category I nonfriable ACM includes packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1% asbestos. Category II nonfriable ACMs are any materials other than Category I materials that contain more than 1% asbestos. Friable ACM and Category I and Category II nonfriable ACMs which are in poor condition and have become friable; which will be subjected to

drilling, sanding, grinding, cutting or abrading; or which could be crushed or pulverized during anticipated renovation or demolition activities are considered regulated ACM (RACM).

The Occupational Safety and Health Administration (OSHA) asbestos standard for construction (29 CFR 1926.1101) regulates workplace exposure to asbestos. The OSHA standard requires that employee exposure to airborne asbestos fibers be maintained below 0.1 asbestos fibers per cubic centimeter of air (0.1 f/cc) as an eight-hour time-weighted average (TWA). The OSHA standard classifies construction and maintenance activities which could disturb ACM, and specifies work practices and precautions which employers must follow when engaging in each class of regulated work.

In the State of Indiana, asbestos activities are regulated by Indiana Department of Environmental Management (IDEM). IDEM requires that any asbestos-related activity conducted in a public building be performed by personnel licensed by IDEM. All facilities (except residential buildings that have four or fewer dwelling units) must be inspected by an IDEM-licensed asbestos inspector prior to the commencement of demolition or renovation activities. Any identified RACM must be removed prior to renovation or demolition activities which will disturb the materials. The owner or operator must provide the IDEM with written notification of planned removal activities at least 10 working days prior to the commencement of asbestos abatement activities. There is a $50 asbestos demolition/renovation fee for those projects involving less than 2,600 linear feet (LF) of friable ACM on pipes, or 1,600 square feet (SF), or 400 cubic feet (CF) of friable ACM on other facility components. Demolition or renovation projects involving greater than these amounts of friable asbestos must pay a fee of $150. IDEM bills owners/operators who submit asbestos demolition/renovation notifications on a quarterly basis. Removal of RACM must be conducted by an IDEM-licensed asbestos abatement contractor under the supervision of an Indiana-licensed project supervisor. Third-party air monitoring is recommended, but not required by IDEM, during the abatement activities.

The above overview is not intended to be inclusive of all potentially pertinent regulatory information. The relevant state, USEPA, and OSHA standards should be consulted prior to undertaking activities involving the demolition, renovation, or maintenance of ACMs.

4.0 FIELD ACTIVITIES - LEAD

In conjunction with the asbestos survey, Terracon conducted a survey of representative site building components in representative areas to identify, test, and assess the condition of accessible painted building components suspected of containing lead (suspect paint). The survey was conducted by Ms. Terri Lewis. As this survey is for the purpose of future renovation, it was not intended to meet the requirements of the HUD Guidelines. Painted surfaces that contain greater than or equal to 1.0 milligram per square centimeter (mg/cm^2) of lead or 0.5% (5,000 milligram

per kilogram [mg/kg]) of lead by weight are defined as LBP by the USEPA, HUD, and State of Indiana regulations.

4.1 Visual Assessment

The survey activities began with visual observation of the interior and exterior of the site buildings to identify suspect paint. An inventory of suspect paint was compiled that documented the general location of the materials. A visual assessment of suspect paint was conducted to assess the condition of the paint and assign a condition of intact, fair or poor. Areas of damaged, peeling, or flaking paint were documented.

4.2 XRF Testing

Based on results of the visual assessment, randomly selected locations of representative suspect paint were tested using an x-ray fluorescence analyzer (XRF). The instrument was used in general accordance with HUD inspection guidelines and the procedures detailed in the manufacturer's XRF performance characteristics sheet (PCS) contained in Appendix E. Calibration checks were performed prior to commencement of testing and again at the completion of testing. The instrument was determined to be properly calibrated during the testing.

A total of 355 XRF readings were collected during the survey. A complete list of the tested locations and results from the survey is included as Appendix D.

4.3 Paint Chip Sample Collection

Lead chip samples were to be collected from surfaces where XRF readings were impractical. Chip samples, if collected, were to be placed in sealable containers and labeled with unique sample numbers using an indelible marker.

Lead chip samples were not collected because all surfaces were tested using an XRF.

4.5 Lead in Soil Sample Collection

Lead soil samples were collected from bare soil in the dripline/foundation area of the buildings. Two composite soil samples, consisting of three subsamples from the top ½ inch of surface soil, were collected using a coring tool on each side of the buildings. Subsamples were collected no closer to each other than one foot and no farther apart than three feet. A total of 16 lead soil samples were collected.

4.4 Sample Analysis

Soil samples were submitted under COC to STAT Analysis Corporation, Chicago, Illinois, for analysis by flame atomic absorption spectroscopy (AAS) in accordance with National Institute for

Occupational Safety and Health (NIOSH) Method 7082. STAT is accredited under the AIHA Laboratory Accreditation Programs, LLC under the Environmental Lead Laboratory Accreditation Program (ELLAP) Accreditation No. 101160. Laboratory analytical results are provided in Appendix D and a copy of STAT's accreditation is provided in Appendix G.

4.5 Regulatory Overview

The USEPA action level for lead-based painted surfaces is 1.0 mg/cm^2 using the XRF method or 0.5% (5,000 mg/kg) dry weight using the atomic absorption analytical method. The USEPA definition of LBP is directed at protecting the general population from exposure to lead in the residential setting. By contrast, the duty of OSHA is to protect workers during construction activities that may generate elevated airborne lead concentrations. OSHA states that construction work (which includes renovation, maintenance, and demolition) carried out on structures coated with paint that has lead concentrations lower than the USEPA regulatory limits can still result in airborne lead concentrations in excess of regulatory limits.

The OSHA Lead Standard for Construction (29 CFR 1926.62) applies to all construction work where an employee may be occupationally exposed to lead. All work related to construction, alteration or repair (including painting and decorating) is included. The lead-in-construction standard applies to any detectable concentration of lead in paint (lead-containing paint (LCP)), as even small concentrations of lead can result in unacceptable employee exposures depending upon the method of removal and other workplace conditions. Under this standard, construction includes, but is not limited to, the following:

- Demolition or salvage of structures where lead or materials containing lead are present
- Removal or encapsulation of materials containing lead
- New construction, alteration, repair, or renovation of structures, substrates, or portions containing lead, or materials containing lead
- Installation of products containing lead
- Lead contamination/emergency clean-up
- Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed
- Maintenance operations associated with construction activities described above

Employers must assure that no employee will be exposed to lead at concentrations greater than 50 micrograms per cubic meter (µg/m^3) averaged over an eight-hour period without adequate protection. The OSHA standard also establishes an action level of 30 µg/m^3, which if exceeded, triggers certain requirements, including periodic exposure monitoring and medical monitoring.

USEPA regulates disposal of hazardous materials. The USEPA has stated that components removed with intact LBP that is not delaminating from the substrate may be disposed as general

demolition debris. If the LBP is stripped from components, or if it is delaminating from the substrate, the waste may be subject to hazardous waste rules [i.e., TCLP].

5.0 FINDINGS AND RECOMMENDATIONS

5.1 ACM Findings and Recommendations

Based on sampling and analysis performed for this survey, the presence of ACM (asbestos in concentrations of more than one percent {1%}) was identified as shown in the table below.

HA No.	Material Description	Material Location	% and Type Asbestos	NESHAP Classification	Condition	Estimated Quantity*
Main House (HS-18)						
2	Drywall joint compound	Basement ceiling and furnace room, 1st floor ceiling living room 101	2% Chrysotile	Friable RACM	Damaged	700 SF
6	Roofing felt paper	Main roof	30% Chrysotile	Category I Non-friable	Damaged	3,000 SF
7	Plaster walls	Basement	Base and top plaster- 2% Chrysotile	Friable RACM	Damaged	1,500 SF
8	Texture on plaster ceilings	Ceilings throughout 1st and 3rd floors	3% Chrysotile	Friable RACM	Damaged	6,000 SF
10	HVAC duct tape	Around HVAC duct work, in walls and at floor vents	60% Chrysotile	Friable RACM	Damaged	600 SF[1]
Brick House (HS-19)						
1	Tan mastic on 12”x12” yellow floor tile	Kitchen 100	2% Chrysotile	Category I Non-friable	Damaged	80 SF
3	9”x9” wood pattern (dark) floor tile and black mastic	Living room 101 (stair landing) and 2nd floor addition 202	Floor Tile and mastic- 5% Chrysotile	Category I Non-friable	Damaged	40 SF
4	9”x9” wood pattern (light) floor tile and black mastic	2nd floor addition 202	Floor Tile and mastic- 5% Chrysotile	Category I Non-friable	Damaged	40 SF
5	9”x9” dark red floor tile and black mastic	Bedroom 200	Floor Tile and mastic- 5% Chrysotile	Category I Non-friable	Damaged	140 SF
7	Tan mastic on 12”x12” multicolored floor tile	Bathroom 201	2% Chrysotile	Category I Non-friable	Damaged	40 SF
8	Tan mastic on white linoleum sheet flooring	Closet 201A	2% Chrysotile	Category I Non-friable	Damaged	25 SF

[1] *Quantity reflects visible insulation and estimated quantity located inside walls.*

HA No.	Material Description	Material Location	% and Type Asbestos	NESHAP Classification	Condition	Estimated Quantity*
9	12”x12” white floor tile and black mastic	Addition 102	Floor Tile-3% Chrysotile Mastic-5% Chrysotile	Category I Non-friable	Damaged	15 SF
10	12”x12” tan floor tile and black mastic	Addition 102	Floor Tile-3% Chrysotile Mastic-5% Chrysotile	Category I Non-friable	Damaged	15 SF
11	12”x12” wood pattern floor tile and black mastic	Addition 102	Floor Tile-5% Chrysotile Mastic-5% Chrysotile	Category I Non-friable	Damaged	15 SF
13	Plaster wall skim coat	Throughout on walls	Skim coat-2% Chrysotile	Friable RACM	Damaged	4,500 SF
15	Roof felt paper	Under shingles	50% Chrysotile	Friable RACM	Damaged	1,500 SF

*Estimated quantities are based on a cursory field evaluation, and actual quantities may vary.

HA = homogeneous area
SF = square feet
LF = linear feet
RACM = Includes friable ACM, category I nonfriable ACM that has become friable, Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.
Category I: Includes asbestos-containing packings, gaskets, asphaltic roofing products, resilient flooring, pliable sealants and pliable mastics.

Based on the findings of the survey, Terracon recommends the following:

- Terracon recommends the identified ACM be removed and disposed by an IDEM-licensed asbestos abatement contractor prior to any activity that will disturb it in accordance with NESHAP regulations. Though not required by regulation, Terracon recommends the work be performed in accordance with a site-specific asbestos project design, prepared by an IDEM-licensed asbestos project designer. Further, it is recommended that an IDEM-licensed asbestos professional represent the Owner on-site during abatement activities to insure that all project activities are conducted in accordance with the asbestos project design and applicable rules and regulations.
- Following removal, final air clearance should be performed.
- Any suspect ACM not previously identified should be treated as assumed ACM until laboratory analysis confirms the presence or absence of asbestos.

5.2 Lead Paint Findings and Recommendations

Based on the results of XRF testing, LBP was detected during the course of the survey. XRF readings determined to be LBP are shown in the table below. XRF data sheets are included in Appendix D.

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm²)
Main House (HS-18)					
Exterior south	Window frame	Wood	Brown	Fair	1.3
Exterior 111-south wall	Window frame	Wood	Brown	Fair	6.3
Exterior 111-south wall	Window trim	Wood	Brown	Fair	4.3
Exterior 111-south wall	Window sill	Wood	Brown	Fair	2.8
Exterior 105-east wall	Window trim	Wood	Brown	Fair	4.2
Exterior 105-east wall	Window sill	Wood	Brown	Fair	2.3
Exterior 105-east wall	1st floor window frame	Wood	Brown	Fair	4.1
Exterior 105-east wall	Window trim	Wood	Brown	Fair	2.7
Exterior 105-east wall	Window sill	Wood	Brown	Fair	3.2
Exterior 104-north wall	Window frame	Wood	Brown	Fair	1.5
Exterior 104-north wall	Window trim	Wood	Brown	Fair	3.4
Exterior 104-north wall	Window sill	Wood	Brown	Fair	4.2
Exterior 103-west wall	Window frame	Wood	Brown	Fair	1.8
Exterior 102-west wall	Window trim	Wood	Brown	Fair	9.8
Exterior 102-west wall	Window sill	Wood	Brown	Fair	4.0
Exterior Basement 101-west wall	Door frame	Wood	Brown	Fair	1.4
Exterior Basement 101-west wall	Threshold	Wood	Brown	Poor	32.5
Exterior south wall	Siding	Wood	Peach	Poor	9.6
Exterior south wall	Ledge	Wood	Brown	Poor	1.1
Exterior south wall	Window frame	Wood	Brown	Poor	1.8
Exterior south wall	Window trim	Wood	Brown	Poor	4.9
Exterior south wall	Window sill	Wood	Brown	Poor	6.8
Room 303-north wall	Wire covering	Wood	White	Poor	2.1
Room 301	Door frame	Wood	White	Poor	7.8
Room 301	Corner cabinet	Wood	White	Poor	13.7
Room 301	Corner cabinet shelf	Wood	White	Poor	6.6
Room 301	Baseboard	Wood	White	Poor	9.8
Room 302	Sink	Cast iron	White	Poor	16.4
Room 302	South wall	Plaster	White	Poor	3.6
Room 302	West wall	Plaster	White	Poor	2.5
Room 302	Door	Wood	White	Poor	4.7
Room 302	Door frame	Wood	White	Poor	10.5
Room 302	Window frame	Wood	White	Poor	6.6
Room 302	Window trim	Wood	White	Poor	11.8

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm^2)
Room 302	Window sill	Wood	Brown	Poor	1.3
Room 302	Toilet	Wood	White	Poor	2.9
Exterior 2nd floor porch east 203	Window frame	Wood	Brown	Poor	1.5
Exterior 2nd floor porch east 204	Window frame	Wood	Brown	Poor	3.2
Exterior 2nd floor porch east 204	Window trim	Wood	Brown	Poor	3.4
Exterior 2nd floor porch east 204	Window sill	Wood	Brown	Poor	4.8
Exterior 2nd floor porch east 204	Screen door	Wood	Brown	Poor	2.0
Exterior 2nd floor porch east 204	Screen door trim	Wood	Brown	Poor	1.3
Room 303A	Window frame	Wood	Brown	Poor	5.5
Room 303A	Window sill	Wood	Brown	Poor	5.4
Room 303B	Window frame	Wood	Brown	Poor	4.9
Room 303B	Window sill	Wood	Brown	Poor	4.5
Room 301A	Window frame	Wood	White	Poor	18.2
Room 301A	Window trim	Wood	White	Poor	8.4
Room 301A	Window sill	Wood	White	Poor	13.1
Tub room 301A	Window frame	Wood	White	Poor	8.5
Tub room 301A	Window trim	Wood	White	Poor	10.9
Tub room 301A	Window sill	Wood	White	Poor	13.0
Room 201A	Window frame	Wood	White	Poor	4.0
Room 201A	Window sill	Wood	White	Poor	9.5
Room 201A	Baseboard	Wood	White	Poor	9.0
Room 201A	Door frame	Wood	White	Poor	13.1
Room 201A	Door trim	Wood	White	Poor	22.6
Room 201A	Threshold	Wood	White	Poor	13.2
Room 201	Floor	Wood	Grey	Poor	1.9
Room 201	Window frame	Wood	White	Fair	10.1
Room 201	Window trim	Wood	White	Fair	22.7
Room 201	Window sill	Wood	White	Fair	21.3
Room 201	Baseboard	Wood	Gray	Fair	23.5
Room 201	Door frame	Wood	Gray	Fair	7.3
Room 202A	Window trim	Wood	Brown	Poor	3.1
Room 202A	Ceiling	Plaster	White	Poor	2.3
Room 202	Window trim	Wood	Brown	Poor	3.8
Room 202	Window sill	Wood	Brown	Poor	1.0
Room 203	Window trim	Wood	Brown	Poor	3.0
Room 202	Window trim	Wood	Brown	Poor	1.6
Room 208	Window frame	Wood	Brown	Poor	3.7
Room 208	Floor vent	Metal	Black	Poor	4.2
Room 208	Wire cover	Wood	White	Poor	1.6
West Porch 2nd floor	Door frame	Wood	Brown	Fair	2.4

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm^2)
Room 104	Fireplace surround	Brick	Brown	Poor	1.7
Room 104	Fireplace tile floor	Ceramic	Brown	Poor	2.3
Room 104	Wall vent	Metal	White	Poor	3.7
Room 104	Painted board behind paneling	Wood	Green	Poor	8.7
Room 003	Door frame	Wood	White	Poor	2.5
Room 003	Door	Wood	Mustard	Poor	14.3
Room 003	Door trim	Wood	White	Poor	3.8
Room 002	Door	Wood	White	Poor	3.0
Room 002	Door frame	Wood	White	Poor	4.7
Room 002	Door trim	Wood	White	Poor	3.8
Room 001	North wall	Brick	Yellow	Poor	2.5
Room 001	West wall	Plaster	White	Poor	4.6
Room 001	Beam (S)	Metal	Brown	Fair	11.3
Room 001	Beam (N)	Metal	Brown	Fair	5.9
Stairs	West wall	Plaster	Tan	Poor	13.6
Stairs	Wire cover	Wood	Tan	Poor	5.3
Brick House (HS-19)					
Exterior west	Left window trim	Wood	Gray	Poor	2.7
Exterior west	Right window trim	Wood	Gray	Poor	3.6
Room 105-south wall	Window trim	Wood	Gray	Poor	3.1
Room 104-south wall	Window trim	Wood	Gray	Poor	4.1
Room 103-south wall	Window trim	Wood	Gray	Poor	1.7
Room 200	Window trim	Wood	Gray	Poor	2.9
Room 200	Railing	Wood	White	Poor	4.9
Room 200-north wall	Window frame	Wood	Gray	Poor	7.5
Room 200-north wall	Window trim	Wood	Gray	Poor	2.0
Room 200-north wall	Window frame	Wood	Gray	Poor	6.4
Room 200-north wall	Window trim	Wood	Gray	Poor	1.9
Room 200-north wall	Baseboard	Wood	White	Poor	9.4
Room 200-north wall	Window trim	Wood	White	Poor	1.2
Room 200-north wall	Window sill	Wood	White	Poor	3.0
Room 201	Tub	Cast iron	White	Poor	13.4
Room 201	Toilet	Cast iron	White	Poor	3.3
Room 201	Sink	Cast iron	White	Poor	13.5
Room 201	Ceiling	Plaster	Green	Poor	1.9
Room 201-north wall	Window frame	Wood	Gray	Poor	3.8
Room 201-north wall	Window trim	Wood	Gray	Poor	2.7
Room 201-north wall	Window trim	Wood	Green	Poor	2.7
Room 201-north wall	Window sill	Wood	Green	Poor	1.6
Room 201A	Door frame	Wood	Green	Poor	2.9
Room 201A	Door trim	Wood	Green	Poor	4.6
Room 102-west wall	Window trim	Wood	Gray	Poor	3.0
Room 102-south wall	Window trim	Wood	Gray	Poor	2.7
Room 102-south wall	Window trim	Wood	Gray	Poor	3.0

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm^2)
Room 101-west wall	Window trim	Wood	Gray	Poor	2.1
Room 100-east wall	Window trim	Wood	Gray	Poor	1.6
Room 101-east wall	Window trim	Wood	White	Poor	9.2
Room 101-east wall	Window sill	Wood	White	Poor	3.0

Based on the findings of the survey, Terracon recommends the following:

- All contractors working in the buildings should be informed of their duties regarding lead under the OSHA Lead in Construction Standard (29 CFR 1926.62), which considers paint with any concentration of lead to be covered under this standard.
- Renovation work should be performed using Lead Safe Work Practices.
- Where the LBP or LCP is to be disturbed or removed, lead-containing wastes should be evaluated for hazardous constituents prior to disposal. Waste with a TCLP concentration of lead greater than 5.0 parts per million (ppm) is considered hazardous. However, metal components coated with LBP may be disposed as scrap metal without performing TCLP testing.

5.2 Lead in Soil Findings and Recommendations

Based on the results of lead soil sampling, lead was detected above the USEPA action level and the IDEM Office of Land Quality (OLQ) Recreational Soil Direct Contact Screening level during the course of the survey as shown in the table below.

Sample Number	Sample Location	Results (mg/Kg)	Above USEPA Action Level (1,200 mg/Kg)	Above IDEM OLQ RSDCS[2] Level (800 mg/Kg)
Main House (HS-18)				
A1	South side dripline/foundation -southwest	1,000	No	**Yes**
A2	South side dripline/foundation -southeast	1,300	**Yes**	**Yes**
B1	East side dripline/foundation -southeast	640	No	No
B2	East side dripline/foundation -northeast	1,100	No	**Yes**
C1	North side dripline/foundation -northeast	860	No	**Yes**
C2	North side dripline/foundation -northwest	360	No	No
D1	West side dripline/foundation -southwest	540	No	No
D2	West side dripline/foundation -northwest	2,900	**Yes**	**Yes**
Brick House (HS-19)				
A1	West side dripline/foundation-southwest	50	No	No

[2] *OLQ RSDCS=Office of Land Quality Recreational Soil Direct Contact Screening*

Sample Number	Sample Location	Results (mg/Kg)	Above USEPA Action Level (1,200 mg/Kg)	Above IDEM OLQ RSDCS[2] Level (800 mg/Kg)
A2	West side dripline/foundation -southeast	58	No	No
B1	South side dripline/foundation -southeast	71	No	No
B2	South side dripline/foundation -northeast	68	No	No
C1	East side dripline/foundation -northeast	78	No	No
C2	East side dripline/foundation -northwest	82	No	No
D1	North side dripline/foundation -southwest	54	No	No
D2	North sid dripline/foundation e-northwest	53	No	No

Based on the findings of the survey, Terracon recommends the following:

- Bare soil should be covered with grass, mulch or other suitable surface covering.
- If soil disturbance is required, further sampling and regulatory reporting may be required.

6.0 LIMITATIONS/GENERAL COMMENTS

This survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions, and recommendations expressed in this report are based on conditions observed during our survey. The information contained in this report is relevant to the dates on which this survey was performed and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by the client for specific application to their project as discussed. This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories, or other third parties supplying information which may have been used in the preparation of this report. No warranty, express or implied is made.

The results, findings, conclusions, and recommendations expressed in the report are based only on conditions that were noted during Terracon's survey. Reasonable efforts to access suspect materials within known areas of restricted access (e.g., crawl spaces) were made; however, confined spaces or areas which may pose a health or safety risk to Terracon personnel were not sampled. Sampling did not include suspect materials which could not be safely reached with available ladders/man-lifts. The selection of sample locations and frequency of sampling was based on Terracon's observations and the assumption that like materials in the same area are homogeneous in content. Concealed hazardous building materials may exist in concealed areas not investigated or identified.

OSHA does not define the amount of lead in paint that constitutes a potential lead exposure hazard, therefore if detectable levels of lead are present in painted surfaces, construction work that disturbs those surfaces would need to be conducted in accordance with the OSHA lead standard for construction (29 CFR 1926.62).

APPENDIX A

CONFIRMED ASBESTOS-CONTAINING MATERIALS
MAIN HOUSE (HS-18) AND BRICK HOUSE (HS-19)
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA
NPS IDIQ # P14PC00446 / PROJECT # P17PD00598

TERRACON PROJECT NO. 11177119

HA No.	Material Description	Material Location	% and Type Asbestos	NESHAP Classification	Condition	Estimated Quantity*
Main House (HS-18)						
2	Drywall joint compound	Basement ceiling and furnace room, 1st floor ceiling living room 101	2% Chrysotile	Friable RACM	Damaged	700 SF
6	Roofing felt paper	Main roof	30% Chrysotile	Category I Non-friable	Damaged	3,000 SF
7	Plaster walls	Basement	Base and top plaster- 2% Chrysotile	Friable RACM	Damaged	1,500 SF
8	Texture on plaster ceilings	Ceilings throughout 1st and 3rd floors	3% Chrysotile	Friable RACM	Damaged	6,000 SF
10	HVAC duct tape	Around HVAC duct work, in walls and at floor vents	60% Chrysotile	Friable RACM	Damaged	600 SF[3]
Brick House (HS-19)						
1	Tan mastic on 12”x12” yellow floor tile	Kitchen 100	2% Chrysotile	Category I Non-friable	Damaged	80 SF
3	9”x9” wood pattern (dark) floor tile and black mastic	Living room 101 (stair landing) and 2nd floor addition 202	Floor Tile and mastic- 5% Chrysotile	Category I Non-friable	Damaged	40 SF
4	9”x9” wood pattern (light) floor tile and black mastic	2nd floor addition 202	Floor Tile and mastic- 5% Chrysotile	Category I Non-friable	Damaged	40 SF
5	9”x9” dark red floor tile and black mastic	Bedroom 200	Floor Tile and mastic- 5% Chrysotile	Category I Non-friable	Damaged	140 SF
7	Tan mastic on 12”x12” multicolored floor tile	Bathroom 201	2% Chrysotile	Category I Non-friable	Damaged	40 SF
8	Tan mastic on white linoleum sheet flooring	Closet 201A	2% Chrysotile	Category I Non-friable	Damaged	25 SF
9	12”x12” white floor tile and black mastic	Addition 102	Floor Tile-3% Chrysotile Mastic-5% Chrysotile	Category I Non-friable	Damaged	15 SF

[3] *Quantity reflects visible insulation and estimated quantity located inside walls.*

APPENDIX A CONTINUED

HA No.	Material Description	Material Location	% and Type Asbestos	NESHAP Classification	Condition	Estimated Quantity*
10	12”x12” tan floor tile and black mastic	Addition 102	Floor Tile-3% Chrysotile Mastic-5% Chrysotile	Category I Non-friable	Damaged	15 SF
11	12”x12” wood pattern floor tile and black mastic	Addition 102	Floor Tile-5% Chrysotile Mastic-5% Chrysotile	Category I Non-friable	Damaged	15 SF
13	Plaster wall skim coat	Throughout on walls	Skim coat-2% Chrysotile	Friable RACM	Damaged	4,500 SF
15	Roof felt paper	Under shingles	50% Chrysotile	Friable RACM	Damaged	1,500 SF

*Estimated quantities are based on a cursory field evaluation, and actual quantities may vary.

HA = homogeneous area
SF = square feet
LF = linear feet
PC = point count
RACM = Includes friable ACM, category I nonfriable ACM that has become friable, Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.
Category I Non-friable: Includes asbestos-containing packings, gaskets, asphaltic roofing products, resilient flooring, pliable sealants and pliable mastics.
Category II Non-friable: Non-friable materials excluding Category I Non-friable.

APPENDIX B

ASBESTOS SURVEY SAMPLE SUMMARY
MAIN HOUSE (HS-18) AND BRICK HOUSE (HS-19)
BAILLY HOMESTEAD
INDIANA DUNES NATIONAL LAKESHORE
PORTER, INDIANA
NPS IDIQ # P14PC00446 / PROJECT # P17PD00598

TERRACON PROJECT NO. 11177119

Sample Number	Material Description	Material Location	Sample Location	Lab Results
Main House (HS-18)				
1-MG4-01	Black stair tread and black mastic	Basement stairs and stairs to 2nd floor	Basement stairs	Floor Felt- ND[4] Black Mastic- ND
1-MG4-02			Basement stairs	Floor Felt- ND Black Mastic-ND
1-MG4-03			Stairs to 2nd floor	Floor Felt- ND Black Mastic-ND
2-WB1-04	**Drywall and joint compound**	**Basement ceiling and furnace room, 1st floor ceiling living room 101**	**Basement ceiling**	Drywall- ND **Joint Compound-2% Chrysotile**
2-WB1-05			**1st floor living room**	Drywall- ND **Joint Compound-2% Chrysotile**
2-WB1-06			**Furnace room**	Drywall- ND **Joint Compound-2% Chrysotile**
3-FC1-07	Pink flower pattern linoleum sheet flooring	3rd floor room 301	3rd floor room 301	Sheet Flooring- ND Fiber Backing- ND
3-FC1-08			3rd floor room 301	Sheet Flooring- ND Fiber Backing- ND
3-FC1-09			3rd floor room 301	Sheet Flooring- ND Fiber Backing- ND
4-FC1-10	Red linoleum sheet flooring	3rd floor room 305 closet and 304	3rd floor room 305	Sheet Flooring- ND Fiber Backing- ND
4-FC1-11			3rd floor room 305	Sheet Flooring- ND Fiber Backing- ND
4-FC1-12			3rd floor room 304	Sheet Flooring- ND Fiber Backing- ND
5-WP6-13	Cloth-coated electrical wiring	Various areas throughout the house in walls	Basement furnace room	ND
5-WP6-14			Stairs from basement	ND
5-WP6-15			Stairs from 1st floor	ND
6-RF2-16	**Roofing felt paper**	**Main roof**	**Main roof**	Top Roofing Felt- ND **Bottom Roofing Felt- 30% Chrysotile**

[4] ND= Asbestos Not Detected

APPENDIX B CONTINUED

Sample Number	Material Description	Material Location	Sample Location	Lab Results
6-RF2-17			**Main roof**	Top Roofing Felt- ND **Bottom Roofing Felt-30% Chrysotile**
6-RF2-18			**Main roof**	Top Roofing Felt- ND **Bottom Roofing Felt-30% Chrysotile**
7-HP1-19	**Wall plaster**	**Plaster walls throughout house**	**Basement**	**Base Plaster-2% Chrysotile** **Top Plaster-2% Chrysotile**
7-HP1-20			**Basement**	**Base Plaster-2% Chrysotile** **Top Plaster-2% Chrysotile**
7-HP1-21			1st floor room 101	Base Plaster-ND Top Plaster-ND
7-HP1-22			1st floor room 101	Base Plaster-ND Top Plaster-ND
7-HP1-23			2nd floor room 203	Base Plaster-ND Top Plaster-ND
7-HP1-24			2nd floor room 201	Base Plaster-ND Top Plaster-ND
7-HP1-25			3rd floor room 301	Base Plaster-ND Top Plaster-ND
7-HP1-26			3rd floor room 303	Base Plaster-ND Top Plaster-ND
7-HP1-27			3rd floor room 304	Base Plaster-ND Top Plaster-ND
8-HP3-28	**Ceiling Plaster**	**Ceiling throughout 1st and 3rd floors plaster**	1st floor room 101	ND
8-HP3-29			1st floor room 101	ND
8-HP3-30			2nd floor room 203	ND
8-HP3-31			2nd floor room 201	Base Plaster-ND Top Plaster-ND
8-HP3-32			2nd floor room 201	Base Plaster-ND Top Plaster-ND
8-HP3-33			3rd floor 303	Base Plaster-ND Top Plaster-ND
8-HP3-34			3rd floor 303	Base Plaster-ND Top Plaster-ND
8-HP3-35			**3rd floor 302**	Base Plaster-ND Middle Plaster-ND Top Plaster-ND **Texture-3% Chrysotile**
8-HP3-36			3rd floor 302	Base Plaster-ND Top Plaster-ND
9-SC4-37	Ceiling texture	Living room 101	Living room 101	ND
9-SC4-38			Living room 101	ND
9-SC4-39			Living room 101	ND
10-MI4-40	**HVAC duct tape**	**Around HVAC duct work, in walls and at floor vents**	**At duct room 104**	**60% Chrysotile**
10-MI4-41			**At duct room 104**	**60% Chrysotile**
10-MI4-42			**At duct room 104**	**60% Chrysotile**

APPENDIX B CONTINUED

Sample Number	Material Description	Material Location	Sample Location	Lab Results
11-MA3-43	Gray grout associated with blue/green stone pattern floor tile	In front of fireplace in living room 101	Living room 101 at fireplace	ND
11-MA3-44			Living room 101 at fireplace	ND
11-MA3-45			Living room 101 at fireplace	ND
12-SC1-46	Exterior window glazing	Exterior window	Exterior window NE	ND
12-SC1-47			Exterior window NW	ND
12-SC1-48			Exterior window SE	ND
001-SC6-001	Brown door membrane	Threshold of north basement door	North basement door	ND
001-SC6-002			North basement door	ND
001-SC6-003			North basement door	ND
Brick House (HS-19)				
1-FT2-01	**12”x12” yellow floor tile and tan mastic**	**Kitchen 100**	**Kitchen 100**	Floor Tile- ND **Tan Mastic- 2% Chrysotile**
1-FT2-02			**Kitchen 100**	Floor Tile- ND **Tan Mastic- 2% Chrysotile**
1-FT2-03			**Kitchen 100**	Floor Tile- ND
2-MG5-04	Grout and adhesive on 4”x4” yellow ceramic wall tile	Kitchen 100	Kitchen 100	Grout- ND Adhesive- ND
2-MG5-05			Kitchen 100	Grout- ND Adhesive- ND
2-MG5-06			Kitchen 100	Grout- ND Adhesive- ND
3-FT1-07	**9”x9” wood pattern (dark) floor tile and black mastic**	**Living room 101 (stair landing) and 2nd floor addition 202**	**Living room 101**	**Floor Tile- 5% Chrysotile Mastic- 5% Chrysotile**
3-FT1-08			**Living room 101**	**Floor Tile- 5% Chrysotile Mastic- 5% Chrysotile**
3-FT1-09			**2nd floor addition 202**	**Floor Tile- 5% Chrysotile Mastic- 5% Chrysotile**
4-FT1-10	**9”x9” wood pattern (light) floor tile and black mastic**	**2nd floor addition 202**	**Addition 202**	**Floor Tile- 5% Chrysotile Mastic- 5% Chrysotile**
4-FT1-11			**Addition 202**	**Floor Tile- 5% Chrysotile Mastic- 5% Chrysotile**
4-FT1-12			**Addition 202**	**Floor Tile- 5% Chrysotile Mastic- 5% Chrysotile**
5-FT1-13	**9”x9” dark red floor tile and black mastic**	**Bedroom 200**	**Bedroom 200**	**Floor Tile- 5% Chrysotile Mastic- 5% Chrysotile**

APPENDIX B CONTINUED

Sample Number	Material Description	Material Location	Sample Location	Lab Results
5-FT1-14			**Bedroom 200**	**Floor Tile- 5% Chrysotile** **Mastic- 5% Chrysotile**
5-FT1-15			**Bedroom 200**	**Floor Tile- 5% Chrysotile** **Mastic- 5% Chrysotile**
6-MG7-16	Yellow carpet	Living room 101 stairs	Living room 101 stairs	ND
6-MG7-17			Living room 101 stairs	ND
6-MG7-18			Living room 101 stairs	ND
7-FT2-19	**12”x12” multicolored floor tile and tan mastic**	**Bathroom 201**	**Bathroom 201**	Floor Tile- ND **Mastic- 2% Chrysotile**
7-FT2-20			**Bathroom 201**	Floor Tile- ND **Mastic- 2% Chrysotile**
7-FT2-21			**Bathroom 201**	Floor Tile- ND **Mastic- 2% Chrysotile**
8-FC1-22	**White linoleum sheet flooring**	**Closet 201A**	**Closet 201A**	Sheet Flooring-ND Fiber Backing-ND **Tan Mastic- 2% Chrysotile**
8-FC1-23			**Closet 201A**	Sheet Flooring-ND Fiber Backing-ND **Tan Mastic- 2% Chrysotile**
8-FC1-24			**Closet 201A**	Sheet Flooring-ND Fiber Backing-ND **Tan Mastic- 2% Chrysotile**
9-FT2-25	**12”x12” white floor tile and black mastic**	**Addition 102**	**Addition 102**	**Floor Tile- 3% Chrysotile** **Mastic- 5% Chrysotile**
9-FT2-26			**Addition 102**	**Floor Tile- 3% Chrysotile** **Mastic- 5% Chrysotile**
9-FT2-27			**Addition 102**	**Floor Tile- 3% Chrysotile** **Mastic- 5% Chrysotile**
10-FT2-28	**12”x12” tan floor tile and black mastic**	**Addition 102**	**Addition 102**	**Floor Tile- 3% Chrysotile** **Mastic- 5% Chrysotile**
10-FT2-29			**Addition 102**	**Floor Tile- 3% Chrysotile** **Mastic- 5% Chrysotile**
10-FT2-30			**Addition 102**	**Floor Tile- 3% Chrysotile** **Mastic- 5% Chrysotile**
11-FT2-31	**12”x12” wood pattern floor tile and black mastic**	**Addition 102**	**Addition 102**	**Floor Tile- 5% Chrysotile** **Mastic- 5% Chrysotile**

APPENDIX B CONTINUED

Sample Number	Material Description	Material Location	Sample Location	Lab Results
11-FT2-32			**Addition 102**	**Floor Tile- 5% Chrysotile** **Mastic- 5% Chrysotile**
11-FT2-33			**Addition 102**	**Floor Tile- 5% Chrysotile** **Mastic- 5% Chrysotile**
12-SC1-34	White exterior window pane glazing	Exterior of window panes	Exterior window NW	ND
12-SC1-35			Exterior window SW	ND
12-SC1-36			Exterior window NE	ND
13-HP1-37	**Plaster wall with skim coat**	**Throughout on walls**	**Kitchen 100**	Plaster- ND **Skim Coat- 2% Chrysotile**
13-HP1-38			Living room 101	Plaster- ND Skim Coat- ND
13-HP1-39			Addition102	Plaster- ND Skim Coat- ND
13-HP1-40			Bathroom 200	Base Plaster- ND Top Plaster- ND
13-HP1-41			Bedroom 200	Base Plaster- ND Top Plaster- ND Skim Coat- ND
13-HP1-42			Bedroom 200	Plaster- ND Skim Coat- ND
13-HP1-43			Addition 202	Plaster- ND Skim Coat- ND
14-HP3-44	Plaster ceiling with skim coat	Throughout ceilings	Kitchen 100	Base Plaster- ND Top Plaster- ND Skim Coat- ND
14-HP3-45			Living room 101	Base Plaster- ND Top Plaster- ND Skim Coat- ND
14-HP3-46			Addition102	Plaster- ND Skim Coat- ND
14-HP3-47			Bathroom 200	Plaster- ND Skim Coat- ND
14-HP3-48			Bedroom 200	Plaster- ND Skim Coat- ND
14-HP3-49			Bedroom 200	Plaster- ND Skim Coat- ND
14-HP3-50			Addition 202	Base Plaster- ND Top Plaster- ND Skim Coat- ND
15-RF1-51	**Roof felt paper and tar paper**	**Under shingles**	**Attic**	**Felt Paper- 50% Chrysotile** Tar Paper-ND
15-RF1-52			**Attic**	**Felt Paper- 50% Chrysotile** Tar Paper-ND

APPENDIX B CONTINUED

Sample Number	Material Description	Material Location	Sample Location	Lab Results
15-RF1-53			**Attic**	**Felt Paper- 50% Chrysotile** Tar Paper-ND

APPENDIX C

ASBESTOS LABORATORY ANALYTICAL REPORTS

PLM Summary Report

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

Lab Job No. : 17B-06940
Report Date : 06/22/2017
Sample Date :06/14/2017

On 6/15/2017, forty eight (48) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
1-MG4-01	Stair Tread (Black), Basement Stairs	None Detected - Floor Felt None Detected - Black Mastic No Stair Tread
1-MG4-02	Stair Tread (Black), Basement Stairs	None Detected - Floor Felt None Detected - Black Mastic No Stair Tread
1-MG4-03	Stair Tread (Black), Stairs to 2nd Floor	None Detected - Floor Felt None Detected - Black Mastic No Stair Tread
2-WB1-04	Drywall / Tape / Joint Compound, Basement Ceiling	None Detected - Drywall Material 2% Chrysotile - Joint Compound
2-WB1-05	Drywall / Tape / Joint Compound, 1st Floor Living Room 101	None Detected - Drywall Material 2% Chrysotile - Joint Compound
2-WB1-06	Drywall / Tape / Joint Compound, Furnace Room	None Detected - Drywall Material 2% Chrysotile - Joint Compound
3-FC1-07	Linoleum Sheet Flooring (Pink Flower Pattern), 3rd Floor Room 301	None Detected - Sheet Flooring None Detected - Fiber Backing
3-FC1-08	Linoleum Sheet Flooring (Pink Flower Pattern), 3rd Floor Room 301	None Detected - Sheet Flooring None Detected - Fiber Backing
3-FC1-09	Linoleum Sheet Flooring (Pink Flower Pattern), 3rd Floor Room 301	None Detected - Sheet Flooring None Detected - Fiber Backing
4-FC1-10	Linoleum Sheet Flooring (Red), 3rd Floor Room 305	None Detected - Sheet Flooring None Detected - Fiber Backing
4-FC1-11	Linoleum Sheet Flooring (Red), 3rd Floor Room 305	None Detected - Sheet Flooring None Detected - Fiber Backing
4-FC1-12	Linoleum Sheet Flooring (Red), 3rd Floor Room 304	None Detected - Sheet Flooring None Detected - Fiber Backing
5-WP6-13	Cloth Coated Electrical Wiring, Basement Furnace Room	None Detected - Wrap
5-WP6-14	Cloth Coated Electrical Wiring, Stairs from Basement	None Detected - Wrap

PLM Summary Report

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

Lab Job No. : 17B-06940
Report Date : 06/22/2017
Sample Date :06/14/2017

On 6/15/2017, forty eight (48) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
5-WP6-15	Cloth Coated Electrical Wiring, Stairs from 1st Floor	None Detected - Wrap
6-RF2-16	Roofing Felt Paper	None Detected - Top Roofing Felt 30% Chrysotile - Bottom Roofing Felt
6-RF2-17	Roofing Felt Paper	None Detected - Top Roofing Felt 30% Chrysotile - Bottom Roofing Felt
6-RF2-18	Roofing Felt Paper	None Detected - Top Roofing Felt 30% Chrysotile - Bottom Roofing Felt
7-HP1-19	Wall Plaster, Basement	2% Chrysotile - Base Plaster 2% Chrysotile - Top Plaster
7-HP1-20	Wall Plaster, Basement	2% Chrysotile - Base Plaster 2% Chrysotile - Top Plaster
7-HP1-21	Wall Plaster, 1st Floor Room 101	None Detected - Base Plaster None Detected - Top Plaster
7-HP1-22	Wall Plaster, 1st Floor Room 101	None Detected - Base Plaster None Detected - Top Plaster
7-HP1-23	Wall Plaster, 2nd Floor Room 203	None Detected - Base Plaster None Detected - Top Plaster
7-HP1-24	Wall Plaster, 2nd Floor Room 201	None Detected - Base Plaster None Detected - Top Plaster
7-HP1-25	Wall Plaster, 3rd Floor Room 301	None Detected - Base Plaster None Detected - Top Plaster
7-HP1-26	Wall Plaster, 3rd Floor Room 303	None Detected - Base Plaster None Detected - Top Plaster
7-HP1-27	Wall Plaster, 3rd Floor Room 304	None Detected - Base Plaster None Detected - Top Plaster
8-HP3-28	Ceiling Plaster, 1st Floor Room 101	None Detected - Plaster
8-HP3-29	Ceiling Plaster, 1st Floor Room 101	None Detected - Plaster

PLM Summary Report

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

Lab Job No. : 17B-06940
Report Date : 06/22/2017
Sample Date :06/14/2017

On 6/15/2017, forty eight (48) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
8-HP3-30	Ceiling Plaster, 2nd Floor Room 203	None Detected - Plaster
8-HP3-31	Ceiling Plaster, 2nd Floor Room 201	None Detected - Base Plaster None Detected - Top Plaster
8-HP3-32	Ceiling Plaster, 2nd Floor Room 201	None Detected - Base Plaster None Detected - Top Plaster
8-HP3-33	Ceiling Plaster, 3rd Floor 303	None Detected - Base Plaster None Detected - Top Plaster
8-HP3-34	Ceiling Plaster, 3rd Floor 303	None Detected - Base Plaster None Detected - Top Plaster
8-HP3-35	Ceiling Plaster, 3rd Floor 302	None Detected - Base Plaster None Detected - Middle Plaster None Detected - Top Plaster 3% Chrysotile - Texture
8-HP3-36	Ceiling Plaster, 3rd Floor 302	None Detected - Base Plaster None Detected - Top Plaster
9-SC4-37	Ceiling Texture, Living Room 101	None Detected - Acoustic Plaster
9-SC4-38	Ceiling Texture, Living Room 101	None Detected - Acoustic Plaster
9-SC4-39	Ceiling Texture, Living Room 101	None Detected - Acoustic Plaster
10-MI4-40	HVAC Duct Tape, At Duct Room 104	60% Chrysotile - Asbestos Tape
10-MI4-41	HVAC Duct Tape, At Duct Room 104	60% Chrysotile - Asbestos Tape
10-MI4-42	HVAC Duct Tape, At Duct Room 104	60% Chrysotile - Asbestos Tape
11-MA3-43	Grout (Gray) Associated with Floor Tile (Blue / Green Stone Pattern), Living Room 101 at Fireplace	None Detected - Grout
11-MA3-44	Grout (Gray) Associated with Floor Tile (Blue / Green Stone Pattern), Living Room 101 at Fireplace	None Detected - Grout
11-MA3-45	Grout (Gray) Associated with Floor Tile (Blue / Green Stone Pattern), Living Room 101 at Fireplace	None Detected - Grout

PLM Summary Report

2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

NVLAP Lab Code 102056-0
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Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

Lab Job No. : 17B-06940
Report Date : 06/22/2017
Sample Date :06/14/2017

On 6/15/2017, forty eight (48) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
12-SC1-46	Exterior Window Caulking, Exterior Window Northeast	None Detected - Caulking
12-SC1-47	Exterior Window Caulking, Exterior Window Northwest	None Detected - Caulking
12-SC1-48	Exterior Window Caulking, Exterior Window Southeast	None Detected - Caulking

These samples were analyzed by layers. Quantification, unless otherwise noted, is performed by calibrated visual estimate. The test report shall not be reproduced, except in full, without written approval of the laboratory. The results relate only to the items tested. These test results do not imply endorsement by NVLAP or any agency of the U.S. Government. Accredited by the National Voluntary Laboratory Accreditation Program for Bulk Asbestos Fiber Analysis under Lab Code 102056-0.

NVLAP LAB #102056-0

Analyst(s): Willie Pruitt
Lab Manager : Heather Lopez
Lab Director : Bruce Crabb

Approved Signatory : Heather Lopez
Approved Signatory : Bruce Crabb

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119

Lab Job No. : 17B-06940
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
1-MG4-01	Floor Felt (Black)	75%	Cellulose Fibers	85%	06/22	WP
			Tar Binders	15%		
	Black Mastic (Black)	25%	Tar Binders	100%		
	No Stair Tread					
1-MG4-02	Floor Felt (Black)	75%	Cellulose Fibers	85%	06/22	WP
			Tar Binders	15%		
	Black Mastic (Black)	25%	Tar Binders	100%		
	No Stair Tread					
1-MG4-03	Floor Felt (Black)	75%	Cellulose Fibers	85%	06/22	WP
			Tar Binders	15%		
	Black Mastic (Black)	25%	Tar Binders	100%		
	No Stair Tread					
2-WB1-04	Drywall Material (White)	85%	Glass Wool Fibers	2%	06/22	WP
			Cellulose Fibers	1%		
			Gypsum / Binders	97%		
	DW Paper / Tape (Tan / White)	5%	Cellulose Fibers	100%		
	Joint Compound (White)	10%	Chrysotile	2%		
			Calcite / Talc / Binders	98%		
2-WB1-05	Drywall Material (White)	90%	Glass Wool Fibers	2%	06/22	WP
			Cellulose Fibers	1%		
			Gypsum / Binders	97%		
	DW Paper / Tape (Tan / White)	5%	Cellulose Fibers	100%		
	Joint Compound (White)	5%	Chrysotile	2%		
			Calcite / Talc / Binders	98%		
2-WB1-06	Drywall Material (White)	90%	Glass Wool Fibers	2%	06/22	WP
			Cellulose Fibers	1%		
			Gypsum / Binders	97%		
	DW Paper / Tape (Tan / White)	5%	Cellulose Fibers	100%		
	Joint Compound (White)	5%	Chrysotile	2%		
			Calcite / Talc / Binders	98%		

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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119

Lab Job No. : 17B-06940
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
3-FC1-07	Sheet Flooring (Maroon)	3%	Calcite / Vinyl Binders	100%	06/22	WP
	Fiber Backing (Black)	97%	Cellulose Fibers	85%		
			Tar Binders	15%		
3-FC1-08	Sheet Flooring (Maroon)	3%	Calcite / Vinyl Binders	100%	06/22	WP
	Fiber Backing (Black)	97%	Cellulose Fibers	85%		
			Tar Binders	15%		
3-FC1-09	Sheet Flooring (Maroon)	3%	Calcite / Vinyl Binders	100%	06/22	WP
	Fiber Backing (Black)	97%	Cellulose Fibers	85%		
			Tar Binders	15%		
4-FC1-10	Sheet Flooring (Beige)	3%	Calcite / Vinyl Binders	100%	06/22	WP
	Fiber Backing (Black)	97%	Cellulose Fibers	85%		
			Tar Binders	15%		
4-FC1-11	Sheet Flooring (Beige)	3%	Calcite / Vinyl Binders	100%	06/22	WP
	Fiber Backing (Black)	97%	Cellulose Fibers	85%		
			Tar Binders	15%		
4-FC1-12	Sheet Flooring (Beige)	3%	Calcite / Vinyl Binders	100%	06/22	WP
	Fiber Backing (Black)	97%	Cellulose Fibers	85%		
			Tar Binders	15%		
5-WP6-13	Wrap (Brown)	100%	Cotton Fibers	100%	06/22	WP
5-WP6-14	Wrap (Brown)	100%	Cotton Fibers	100%	06/22	WP
5-WP6-15	Wrap (Brown)	100%	Cotton Fibers	100%	06/22	WP
6-RF2-16	Top Roofing Felt (Black)	50%	Cellulose Fibers	85%	06/22	WP
			Tar Binders	15%		
	Bottom Roofing Felt (Light Grey)	50%	Chrysotile	30%		
			Cellulose Fibers	40%		
			Tar Binders	30%		

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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119

Lab Job No. : 17B-06940
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
6-RF2-17	Top Roofing Felt (Black)	50%	Cellulose Fibers	85%	06/22	WP
			Tar Binders	15%		
	Bottom Roofing Felt (Light Grey)	50%	Chrysotile	30%		
			Cellulose Fibers	40%		
			Tar Binders	30%		
6-RF2-18	Top Roofing Felt (Black)	50%	Cellulose Fibers	85%	06/22	WP
			Tar Binders	15%		
	Bottom Roofing Felt (Light Grey)	50%	Chrysotile	30%		
			Cellulose Fibers	40%		
			Tar Binders	30%		
7-HP1-19	Base Plaster (Off-White)	70%	Chrysotile	2%	06/22	WP
			Hair Fibers	2%		
			Aggregate	61%		
			Calcite / Binders	35%		
	Top Plaster (White)	30%	Chrysotile	2%		
			Calcite / Binders	98%		
7-HP1-20	Base Plaster (Off-White)	70%	Chrysotile	2%	06/22	WP
			Hair Fibers	2%		
			Aggregate	61%		
			Calcite / Binders	35%		
	Top Plaster (White)	30%	Chrysotile	2%		
			Calcite / Binders	98%		
7-HP1-21	Base Plaster (Light Tan)	90%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	10%	Calcite / Binders	100%		
7-HP1-22	Base Plaster (Light Tan)	95%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	5%	Calcite / Binders	100%		

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119

Lab Job No. : 17B-06940
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
7-HP1-23	Base Plaster (Light Tan)	97%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	3%	Calcite / Binders	100%		
7-HP1-24	Base Plaster (Light Tan)	98%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	2%	Calcite / Binders	100%		
7-HP1-25	Base Plaster (Light Tan)	95%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	5%	Calcite / Binders	100%		
7-HP1-26	Base Plaster (Light Tan)	97%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	3%	Calcite / Binders	100%		
7-HP1-27	Base Plaster (Light Tan)	98%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	2%	Calcite / Binders	100%		
8-HP3-28	Plaster (Off-White)	100%	Plastic	65%	06/22	WP
			Calcite / Binders	35%		
8-HP3-29	Plaster (Off-White)	100%	Plastic	65%	06/22	WP
			Calcite / Binders	35%		
8-HP3-30	Plaster (Off-White)	100%	Plastic	65%	06/22	WP
			Calcite / Binders	35%		
8-HP3-31	Base Plaster (Light Tan)	98%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	2%	Calcite / Binders	100%		

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Farmers Branch, TX 75234 Phone: (972) 241-8460

PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119

Lab Job No. : 17B-06940
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
8-HP3-32	Base Plaster (Light Tan)	98%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	2%	Calcite / Binders	100%		
8-HP3-33	Base Plaster (Light Tan)	98%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	2%	Calcite / Binders	100%		
8-HP3-34	Base Plaster (Light Tan)	98%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	2%	Calcite / Binders	100%		
8-HP3-35	Base Plaster (Light Grey)	55%	Calcite / Gypsum Binders	100%	06/22	WP
	Middle Plaster (Light Tan)	30%	Hair Fibers	2%		
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	10%	Calcite / Binders	100%		
	Texture (White)	5%	Chrysotile	3%		
			Calcite / Talc / Binders	97%		
8-HP3-36	Base Plaster (Light Tan)	98%	Hair Fibers	2%	06/22	WP
			Aggregate	63%		
			Calcite / Binders	35%		
	Top Plaster (White)	2%	Calcite / Binders	100%		
9-SC4-37	Acoustic Plaster (Grey)	100%	Perlite	65%	06/22	WP
			Calcite / Binders	35%		
9-SC4-38	Acoustic Plaster (Grey)	100%	Perlite	65%	06/22	WP
			Calcite / Binders	35%		
9-SC4-39	Acoustic Plaster (Grey)	100%	Perlite	65%	06/22	WP
			Calcite / Binders	35%		

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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Houses, 578 Howe, Chesterton, IN, Main House
Project # : 11177119

Lab Job No. : 17B-06940
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
10-MI4-40	Asbestos Tape (Light Grey)	100%	Chrysotile	60%	06/22	WP
			Cellulose Fibers	35%		
			Binders / Fillers	5%		
10-MI4-41	Asbestos Tape (Light Grey)	100%	Chrysotile	60%	06/22	WP
			Cellulose Fibers	35%		
			Binders / Fillers	5%		
10-MI4-42	Asbestos Tape (Light Grey)	100%	Chrysotile	60%	06/22	WP
			Cellulose Fibers	35%		
			Binders / Fillers	5%		
11-MA3-43	Grout (Grey)	100%	Aggregate	65%	06/22	WP
			Cement Binders	35%		
11-MA3-44	Grout (Grey)	100%	Aggregate	65%	06/22	WP
			Cement Binders	35%		
11-MA3-45	Grout (Grey)	100%	Aggregate	65%	06/22	WP
			Cement Binders	35%		
12-SC1-46	Caulking (Off-White)	100%	Calcite	40%	06/22	WP
			Binders / Fillers	60%		
12-SC1-47	Caulking (Off-White)	100%	Calcite	40%	06/22	WP
			Binders / Fillers	60%		
12-SC1-48	Caulking (Off-White)	100%	Calcite	40%	06/22	WP
			Binders / Fillers	60%		

Terracon

Asbestos Bulk Sample Log & Chain of Custody Form

Lab Use Only: 17B-06940 PLM 4B

Lab Location:

Naperville: 135 Ambassador Dr., Naperville, IL 60540 (630) 717 4263

Page 1 of 3

Project Name:	Historic Houses	Project Number:	11177119	Project Manager:	Joseph T. Keca
Project Address:	578 Howe Road	City/State / Zip:	Chesterton, IN	Email Results To:	heather.Eckard@terracon.com; Joe.keca@terracon.com
Site/Building:	Main House				

Sample Identification HA # – BS Code – Sample #	Written location where bulk sample is collected	HA General Location	Material Description (Color/Texture/Etc.)	Quantity (SF, LF, CF, Units)	NESHAP Category[1]	Condition[2]/ Notes
1 – MG4 – 01	Basement Stairs	Basement stairs; stairs to 2nd flr	Black stair tread	36SF	F C1 C2	G D SD
– – 02	↓					
– – 03	Stairs to 2nd flr.					
2 – WB1 – 04	Basement ceiling	Basement ceiling; furnace room 1st flr ceiling, living rm 101	Drywall / Tape / Joint Compound	700SF	F C1 C2	G D SD
– – 05	1st flr living rm 101					
– – 06	furnace room					
3 – FC1 – 07	3rd floor rm 301	3rd floor 301	pink flower pattern linoleum sheet flooring	150SF	F C1 C2	G D SD
– – 08	↓					
– – 09	↓					
4 – FC1 – 10	3rd floor rm 305	3rd floor closet 305; 3rd flr 304	red linoleum sheet flooring	250SF	F C1 C2	G D SD
– – 11						
– – 12	3rd floor rm 304					
5 – WP6 – 13	Basement furnace room	Various areas throughout the house - in walls	Cloth-coated electrical wiring	100LF +/-	F C1 C2	G D SD
– – 14	Stairs from basement					
– – 15	Stairs from 1st flr					

Sampling Date: 6/14/17 Collected by (print): Joseph T. Keca Inspector's Signature: [signature]

Relinquished by: [signature] Date/Time: 6/14/17 Received by: [signature] via FedEx Date/Time 6-15-17 10:04 AM

Analysis: PLM EPA 600/R-93/116 ☒ PLM 400 Point Count ☐ TEM ☐ Other _____ Instructions:

Turnaround Time: 6 Hrs ☐ 24 Hrs ☐ 2 Days ☐ 3 Days ☐ 5 Days ☒ Other _____ Terracon ARMS: ☒ Stop Positive: ☐ Number of samples: _____

[1] F = Friable; C1 = Category I Nonfriable: packings, gaskets, resilient floor covering, and asphalt roofing products; C2 = Category II Nonfriable: any nonfrible material other than Category I Nonfriable

[2] G = Good (no damage); D = Damaged (<10% distributed or <25% localized); or SD = Significantly Damaged (>10% distributed or >25% localized)

Terracon

Asbestos Bulk Sample Log & Chain of Custody Form

Lab Use Only: 17A-06940

Lab Location:

Naperville: 135 Ambassador Dr., Naperville, IL 60540 (630) 717 4263

Site/Building:		Project Number:	

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Color/Texture/Etc.)	Quantity (SF, LF, CF, Units)	NESHAP Category[1]	Condition[2]/ Notes
6 - RF2 - 16		Main roof	Roofing felt paper	3,000SF	F C1 C2	G D SD
- - 17						
- - 18						
7 - HP1 - 19	Basement		Wall plaster	12,000SF	F C1 C2	G D SD
- - 20	1					
- - 21	1st flr rm 101				F C1 C2	G D SD
- - 22	"					
- - 23	2nd flr rm 203				F C1 C2	G D SD
- - 24	" 201					
- - 25	3rd flr rm. 301				F C1 C2	G D SD
- - 26	303					
- - 27	304					
8 - HP3 - 28	1st floor rm 101		Ceiling plaster	6,000SF	F C1 C2	G D SD
- - 29	"					
- - 30	2nd flr rm 203				F C1 C2	G D SD
- - 31	rm 201					
- - 32	"					
- - 33	3rd floor 303				F C1 C2	G D SD
34	"					

Terracon

Asbestos Bulk Sample Log & Chain of Custody Form

Lab Use Only: 17B-06940

Lab Location:

Naperville: 135 Ambassador Dr., Naperville, IL 60540 (630) 717 4263

Site/Building:

Project Number:

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Color/Texture/Etc.)	Quantity (SF, LF, CF, Units)	NESHAP Category[1]	Condition[2]/ Notes
8 - HP3 - 35	3rd floor 302		Plaster ceiling		F C1 C2	G D SD
- - 36	↓					
9 - SC4 - 37	living rm 101		ceiling texture	350SF		
- - 38	↓				F C1 C2	G D SD
- - 39						
10 - MI4 - 40	@ duct rm 104	around HVAC Duct work	HVAC Duct tape			
- - 41	↓	In walls and @ floor vents	(Asbestos)	600SF +/-	F C1 C2	G D SD
- - 42	↓					
11 - MA3 - 43	living room 101 @ fireplace	in front of fire place	Grey grout associated w/ Blue/Green stone pattern floor tile	40SF	F C1 C2	G D SD
- - 44	↓					
- - 45	↓					
12 - SC1 - 46	Exterior Window N.E		Exterior window	200LF		
- - 47	↓ N.W		Glazing		F C1 C2	G D SD
- - 48	↓ S.E					
- -						
- -					F C1 C2	G D SD
- -						
- -						

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com

NVLAP Lab Code 101202-0

ASBESTOS ANALYSIS BY POLARIZED LIGHT MICROSCOPY

Method: EPA/600/R-93/116

Terracon Consultants, Inc.
135 Ambassador Drive
Naperville, IL 60540
Phone: (630) 357-7228
Fax: (630) 357-9489

Reference: 11177119
Location: Bailly's Homestead Main House
Batch No.: 330856
Customer No.: 507

Date Received: 06/15/2017
Date Analyzed: 06/16/2017
Date Reported: 06/16/2017
Turn Around Time: 5 Days

Laboratory Sample	Customer Sample Number	Asbestos Components (%)	Non-Asbestos Components (%)
330856001	001-SC6-001	ND	Binder 99-100%
330856002	001-SC6-002	ND	Binder 99-100%
330856003	001-SC6-003	ND	Binder 99-100%

ND = Asbestos Not Detected (Not Present) NA = Not Analyzed NS = Not Submitted

Components of inhomogeneous samples are analyzed per our Standard Operating Procedure, or per customer request.

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The information contained in this report and any attachments is confidential information intended only for the use of the individual or entities named above. The results of this report relate only to the samples tested. If you have received this report in error, please notify us immediately by phone.This report shall not be reproduced, except in its entirety, unless written approval has been obtained from the laboratory. This report remains property of STAT Analysis until payment is received in full (see invoice).

Analyzed by Name : Henry Robatean / Microscopist

Date: 06/16/2017

STAT Analysis Corporation
2242 W. Harrison, Suite 200, Chicago, Illinois 60612 Phone: (312) 733-0551 Fax: (312) 733-2386
e-mail address: STATinfo@STATAnalysis.com

CHAIN OF CUSTODY RECORD

Page : 1 of ____

Client: Terracon
Street Address: 135 Ambassador
City, State, Zip: Naperville, IL
Phone: 815-483-9493
Fax:
e-mail/Alt. Fax: Joe.Keca@terracon.com
Project Number: 11177119
Project Name: Baillys Homestead
Project Location: Main House
Project Manager: Brendan Qualy
P.O. Number:

Turn Around: Immediate: ☐ 4 Hrs: ☐ 8 Hrs: ☐ 24 Hrs: ☐ 1 Day: ☐ 2 Days: ☐ 3 Days: ☐ 5 Days: ☒
Date Due: ____ Time Due: ____ Note: Not all turn around times are available for all analysis.

OFFICE USE ONLY BELOW:
Batch No.: 330856
Samples Acceptable: Yes: ☒ No: ☐
Checked by (Initial/Date): 6/14/17
QC by (Initial/Date): 6/14/17
Reported By (Initial/Date/Time/Method):
Comments:

Relinquished by: [signature] Date/Time: 6/14/17
Received by: 670741919472 Date/Time: FedEx
Relinquished by: FedEx Date/Time:
Received by: [signature] Date/Time: 6/14/17 1647
Relinquished by: Date/Time:
Received by: Date/Time:

Client Sample Number/Description:	Date Taken	Time On	Time Off	Rate (lpm)	Volume (Liters)	Area Wiped (ft^2)	Laboratory Sample No.	PCM Asbestos	PLM Asbestos (Bulk)	PLM Point Count	PLM Gravimetric	TEM Air Asbestos	TEM Bulk Asbestos	TEM Gravimetric Asb.	TEM Microvac Asb.	TEM Water	Other:
001-SC6-001	6/14/17					3 SF	- damaged		X								
↓ ↓ 002	↓					Threshold of N. basement			↓								
↓ ↓ 003	↓					door - membrane - brown			↓								

Comments: ____

PLM Summary Report

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

Lab Job No. : 17B-06936
Report Date : 06/22/2017
Sample Date :06/14/2017

On 6/15/2017, fifty three (53) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
1-FT2-01	12" x 12" Floor Tile (Yellow), Kitchen 100	None Detected - Floor Tile 2% Chrysotile - Tan Mastic
1-FT2-02	12" x 12" Floor Tile (Yellow), Kitchen 100	None Detected - Floor Tile 2% Chrysotile - Tan Mastic
1-FT2-03	12" x 12" Floor Tile (Yellow), Kitchen 100	None Detected - Floor Tile No Mastic
2-MG5-04	4" x 4" Ceramic Wall Tile (Yellow), Adhesive (Brown), Kitchen 100	None Detected - Grout None Detected - Adhesive
2-MG5-05	4" x 4" Ceramic Wall Tile (Yellow), Adhesive (Brown), Kitchen 100	None Detected - Grout None Detected - Adhesive
2-MG5-06	4" x 4" Ceramic Wall Tile (Yellow), Adhesive (Brown), Kitchen 100	None Detected - Grout None Detected - Adhesive
3-FT1-07	9" x 9" Floor Tile (Wood Pattern, Dark), Living Room 101	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
3-FT1-08	9" x 9" Floor Tile (Wood Pattern, Dark), Living Room 101	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
3-FT1-09	9" x 9" Floor Tile (Wood Pattern, Dark), 2nd Floor Addition 202	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
4-FT1-10	9" x 9" Floor Tile (Wood Pattern, Light), Addition 202	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
4-FT1-11	9" x 9" Floor Tile (Wood Pattern, Light), Addition 202	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
4-FT1-12	9" x 9" Floor Tile (Wood Pattern, Light), Addition 202	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
5-FT1-13	9" x 9" Floor Tile (Dark Red), Bedroom 200	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
5-FT1-14	9" x 9" Floor Tile (Dark Red), Bedroom 200	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic

PLM Summary Report

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460
NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

Lab Job No. : 17B-06936
Report Date : 06/22/2017
Sample Date :06/14/2017

On 6/15/2017, fifty three (53) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
5-FT1-15	9" x 9" Floor Tile (Dark Red), Bedroom 200	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
6-MG7-16	Carpet (Yellow), Living Room 101, Stairs	None Detected - Carpet
6-MG7-17	Carpet (Yellow), Living Room 101, Stairs	None Detected - Carpet
6-MG7-18	Carpet (Yellow), Living Room 101, Stairs	None Detected - Carpet
7-FT2-19	12" x 12" Floor Tile (Multi-Colored), Bathroom 201	None Detected - Floor Tile 2% Chrysotile - Tan Mastic
7-FT2-20	12" x 12" Floor Tile (Multi-Colored), Bathroom 201	None Detected - Floor Tile 2% Chrysotile - Tan Mastic
7-FT2-21	12" x 12" Floor Tile (Multi-Colored), Bathroom 201	None Detected - Floor Tile 2% Chrysotile - Tan Mastic
8-FC1-22	Linoleum Sheet Flooring (White), Closet 201A	None Detected - Sheet Flooring None Detected - Fiber Backing 2% Chrysotile - Tan Mastic
8-FC1-23	Linoleum Sheet Flooring (White), Closet 201A	None Detected - Sheet Flooring None Detected - Fiber Backing 2% Chrysotile - Tan Mastic
8-FC1-24	Linoleum Sheet Flooring (White), Closet 201A	None Detected - Sheet Flooring None Detected - Fiber Backing 2% Chrysotile - Tan Mastic
9-FT2-25	12" x 12" Floor Tile (White), Addition 102	3% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
9-FT2-26	12" x 12" Floor Tile (White), Addition 102	3% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
9-FT2-27	12" x 12" Floor Tile (White), Addition 102	3% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
10-FT2-28	12" x 12" Floor Tile (Tan), Addition 102	3% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic

PLM Summary Report

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119
Identification : Asbestos, Bulk Sample Analysis
Test Method : Polarized Light Microscopy / Dispersion Staining (PLM/DS)
EPA Method 600 / R-93 / 116

Lab Job No. : 17B-06936
Report Date : 06/22/2017
Sample Date :06/14/2017

On 6/15/2017, fifty three (53) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
10-FT2-29	12" x 12" Floor Tile (Tan), Addition 102	3% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
10-FT2-30	12" x 12" Floor Tile (Tan), Addition 102	3% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
11-FT2-31	12" x 12" Floor Tile (Wood Pattern), Addition 102	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
11-FT2-32	12" x 12" Floor Tile (Wood Pattern), Addition 102	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
11-FT2-33	12" x 12" Floor Tile (Wood Pattern), Addition 102	5% Chrysotile - Floor Tile 5% Chrysotile - Black Mastic
12-SC1-34	Exterior Window Pane Glazing (White), Exterior Window, Northwest	None Detected - Window Glazing
12-SC1-35	Exterior Window Pane Glazing (White), Exterior Window, Southwest	None Detected - Window Glazing
12-SC1-36	Exterior Window Pane Glazing (White), Exterior Window, Northeast	None Detected - Window Glazing
13-HP1-37	Plaster Wall with Skim Coat, Kitchen	None Detected - Plaster 2% Chrysotile - Skim Coat
13-HP1-38	Plaster Wall with Skim Coat, Living Room 101	None Detected - Plaster None Detected - Skim Coat
13-HP1-39	Plaster Wall with Skim Coat, Addition 102	None Detected - Plaster None Detected - Skim Coat
13-HP1-40	Plaster Wall with Skim Coat, Bathroom 200	None Detected - Plaster None Detected - Skim Coat
13-HP1-41	Plaster Wall with Skim Coat, Bedroom 200	None Detected - Base Plaster None Detected - Top Plaster None Detected - Skim Coat
13-HP1-42	Plaster Wall with Skim Coat, Bedroom 200	None Detected - Plaster None Detected - Skim Coat

PLM Summary Report

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
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Lab Job No. : 17B-06936
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Sample Date :06/14/2017

On 6/15/2017, fifty three (53) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content
13-HP1-43	Plaster Wall with Skim Coat, Addition 202	None Detected - Plasters None Detected - Skim Coat
14-HP3-44	Plaster Ceiling with Skim Coat, Kitchen 100	None Detected - Base Plaster None Detected - Top Plaster None Detected - Skim Coat
14-HP3-45	Plaster Ceiling with Skim Coat, Living Room 101	None Detected - Base Plaster None Detected - Top Plaster None Detected - Skim Coat
14-HP3-46	Plaster Ceiling with Skim Coat, Addition 102	None Detected - Plaster None Detected - Skim Coat
14-HP3-47	Plaster Ceiling with Skim Coat, Bathroom 200	None Detected - Plaster None Detected - Skim Coat
14-HP3-48	Plaster Ceiling with Skim Coat, Bedroom 200	None Detected - Plaster None Detected - Skim Coat
14-HP3-49	Plaster Ceiling with Skim Coat, Bedroom 200	None Detected - Plaster None Detected - Skim Coat
14-HP3-50	Plaster Ceiling with Skim Coat, Addition 202	None Detected - Base Plaster None Detected - Top Plaster None Detected - Textured Paint
15-RF1-51	Roof Felt Paper with Tar Paper, Attic	50% Chrysotile - Felt Paper None Detected - Tar Paper
15-RF1-52	Roof Felt Paper with Tar Paper, Attic	50% Chrysotile - Felt Paper None Detected - Tar Paper
15-RF1-53	Roof Felt Paper with Tar Paper, Attic	50% Chrysotile - Felt Paper None Detected - Tar Paper

PLM Summary Report

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client :	Terracon - Naperville	Lab Job No. :	17B-06936
Project :	Historic Building, 578 Howe Rd., Chesterton, IN	Report Date :	06/22/2017
Project # :	11177119	Sample Date :	06/14/2017
Identification :	Asbestos, Bulk Sample Analysis		
Test Method :	Polarized Light Microscopy / Dispersion Staining (PLM/DS) EPA Method 600 / R-93 / 116		

On 6/15/2017, fifty three (53) bulk material samples were submitted by Joseph Keca of Terracon - Naperville for asbestos analysis by PLM/DS. The PLM Detail Report is attached; additional information may be found therein. The results are summarized below:

Sample Number	Client Sample Description / Location	Asbestos Content

These samples were analyzed by layers. Quantification, unless otherwise noted, is performed by calibrated visual estimate. The test report shall not be reproduced, except in full, without written approval of the laboratory. The results relate only to the items tested. These test results do not imply endorsement by NVLAP or any agency of the U.S. Government. Accredited by the National Voluntary Laboratory Accreditation Program for Bulk Asbestos Fiber Analysis under Lab Code 102056-0.

NVLAP® LAB #102056-0

Analyst(s): Ashley Chambers

Lab Manager : Heather Lopez — Approved Signatory : Heather Lopez

Lab Director : Bruce Crabb — Approved Signatory : Bruce Crabb

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Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119

Lab Job No. : 17B-06936
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
1-FT2-01	Floor Tile (Off-White)	95%	Calcite / Vinyl Binders	100%	06/22	AC
	Tan Mastic (Tan)	5%	Chrysotile	2%		
			Glue Binders	98%		
1-FT2-02	Floor Tile (Off-White)	95%	Calcite / Vinyl Binders	100%	06/22	AC
	Tan Mastic (Tan)	5%	Chrysotile	2%		
			Glue Binders	98%		
1-FT2-03	Floor Tile (Off-White)	100%	Calcite / Vinyl Binders	100%	06/22	AC
	No Mastic					
2-MG5-04	Grout (White)	50%	Calcite / Binders	100%	06/22	AC
	Adhesive (Brown)	50%	Glue Binders	100%		
2-MG5-05	Grout (White)	50%	Calcite / Binders	100%	06/22	AC
	Adhesive (Brown)	50%	Glue Binders	100%		
2-MG5-06	Grout (White)	50%	Calcite / Binders	100%	06/22	AC
	Adhesive (Brown)	50%	Glue Binders	100%		
3-FT1-07	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
3-FT1-08	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
3-FT1-09	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		

Moody Labs
2051 Valley View Lane
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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119

Lab Job No. : 17B-06936
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
4-FT1-10	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
4-FT1-11	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
4-FT1-12	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
5-FT1-13	Floor Tile (Brown)	99%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	1%	Chrysotile	5%		
			Tar Binders	95%		
5-FT1-14	Floor Tile (Brown)	99%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	1%	Chrysotile	5%		
			Tar Binders	95%		
5-FT1-15	Floor Tile (Brown)	99%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	1%	Chrysotile	5%		
			Tar Binders	95%		
6-MG7-16	Carpet (Tan)	100%	Cellulose Fibers	80%	06/22	AC
			Cotton Fibers	20%		
6-MG7-17	Carpet (Tan)	100%	Cellulose Fibers	80%	06/22	AC
			Cotton Fibers	20%		
6-MG7-18	Carpet (Tan)	100%	Cellulose Fibers	80%	06/22	AC
			Cotton Fibers	20%		

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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119

Lab Job No. : 17B-06936
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
7-FT2-19	Floor Tile (Blue)	98%	Calcite / Vinyl Binders	100%	06/22	AC
	Tan Mastic (Tan)	2%	Chrysotile	2%		
			Glue Binders	98%		
7-FT2-20	Floor Tile (Blue)	98%	Calcite / Vinyl Binders	100%	06/22	AC
	Tan Mastic (Tan)	2%	Chrysotile	2%		
			Glue Binders	98%		
7-FT2-21	Floor Tile (Blue)	98%	Calcite / Vinyl Binders	100%	06/22	AC
	Tan Mastic (Tan)	2%	Chrysotile	2%		
			Glue Binders	98%		
8-FC1-22	Sheet Flooring (Off-White)	20%	Calcite / Vinyl Binders	100%	06/22	AC
	Fiber Backing (Black)	75%	Cellulose Fibers	85%		
			Tar Binders	15%		
	Tan Mastic (Tan)	5%	Chrysotile	2%		
			Glue Binders	98%		
8-FC1-23	Sheet Flooring (Off-White)	20%	Calcite / Vinyl Binders	100%	06/22	AC
	Fiber Backing (Black)	75%	Cellulose Fibers	85%		
			Tar Binders	15%		
	Tan Mastic (Tan)	5%	Chrysotile	2%		
			Glue Binders	98%		
8-FC1-24	Sheet Flooring (Off-White)	20%	Calcite / Vinyl Binders	100%	06/22	AC
	Fiber Backing (Black)	75%	Cellulose Fibers	85%		
			Tar Binders	15%		
	Tan Mastic (Tan)	5%	Chrysotile	2%		
			Glue Binders	98%		
9-FT2-25	Floor Tile (White)	98%	Chrysotile	3%	06/22	AC
			Calcite / Vinyl Binders	97%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		

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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119

Lab Job No. : 17B-06936
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
9-FT2-26	Floor Tile (White)	98%	Chrysotile	3%	06/22	AC
			Calcite / Vinyl Binders	97%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
9-FT2-27	Floor Tile (White)	98%	Chrysotile	3%	06/22	AC
			Calcite / Vinyl Binders	97%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
10-FT2-28	Floor Tile (Grey)	98%	Chrysotile	3%	06/22	AC
			Calcite / Vinyl Binders	97%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
10-FT2-29	Floor Tile (Grey)	98%	Chrysotile	3%	06/22	AC
			Calcite / Vinyl Binders	97%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
10-FT2-30	Floor Tile (Grey)	98%	Chrysotile	3%	06/22	AC
			Calcite / Vinyl Binders	97%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
11-FT2-31	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
11-FT2-32	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		

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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119

Lab Job No. : 17B-06936
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
11-FT2-33	Floor Tile (Brown)	98%	Chrysotile	5%	06/22	AC
			Calcite / Vinyl Binders	95%		
	Black Mastic (Black)	2%	Chrysotile	5%		
			Tar Binders	95%		
12-SC1-34	Window Glazing (Light Grey)	100%	Calcite	60%	06/22	AC
			Binders / Fillers	40%		
12-SC1-35	Window Glazing (Light Grey)	100%	Calcite	60%	06/22	AC
			Binders / Fillers	40%		
12-SC1-36	Window Glazing (Off-White)	100%	Calcite	60%	06/22	AC
			Binders / Fillers	40%		
13-HP1-37	Plaster (Grey)	95%	Aggregate	65%	06/22	AC
			Calcite / Binders	35%		
	Skim Coat (White)	5%	Chrysotile	2%		
			Calcite / Talc / Binders	98%		
13-HP1-38	Plaster (White)	98%	Calcite / Binders	100%	06/22	AC
	Skim Coat (Blue)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		
13-HP1-39	Plaster (Off-White)	98%	Hair Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Skim Coat (Light Pink)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		
13-HP1-40	Plaster (Tan)	98%	Hair Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Skim Coat (White)	2%	Calcite / Binders	100%		

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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119

Lab Job No. : 17B-06936
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
13-HP1-41	Base Plaster (Off-White)	88%	Hair Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Top Plaster (White)	10%	Calcite / Binders	100%		
	Skim Coat (Tan)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		
13-HP1-42	Plaster (Tan)	98%	Hair Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Skim Coat (White)	2%	Calcite / Binders	100%		
13-HP1-43	Plasters (Tan / Grey)	90%	Hair Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Skim Coat (White)	10%	Perlite	5%		
			Calcite / Binders	95%		
14-HP3-44	Base Plaster (Light Tan)	88%	Vermiculite	65%	06/22	AC
			Calcite / Binders	35%		
	Top Plaster (White)	10%	Calcite / Binders	100%		
	Skim Coat (Tan)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		
14-HP3-45	Base Plaster (Grey)	93%	Hair Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Top Plaster (White)	5%	Calcite / Binders	100%		
	Skim Coat (White)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		

Moody Labs
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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119

Lab Job No. : 17B-06936
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
14-HP3-46	Plaster (Tan)	98%	Hair Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Skim Coat (Tan)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		
14-HP3-47	Plaster (Light Tan)	98%	Cellulose Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Skim Coat (Green)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		
14-HP3-48	Plaster (Light Tan)	98%	Cellulose Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Skim Coat (Light Tan)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		
14-HP3-49	Plaster (Light Tan)	98%	Cellulose Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Skim Coat (Light Tan)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		
14-HP3-50	Base Plaster (Light Tan)	83%	Hair Fibers	<1%	06/22	AC
			Aggregate	65%		
			Calcite / Binders	35%		
	Top Plaster (White)	15%	Calcite / Binders	100%		
	Textured Paint (Off-White)	2%	Quartz Grains	2%		
			Pigment / Binders	98%		

Moody Labs
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PLM Detail Report

Supplement to PLM Summary Report

NVLAP Lab Code 102056-0
TDSHS License No. 30-0084

Client : Terracon - Naperville
Project : Historic Building, 578 Howe Rd., Chesterton, IN
Project # : 11177119

Lab Job No. : 17B-06936
Report Date : 06/22/2017

Sample Number	Layer	% Of Sample	Components	% of Layer	Analysis Date	Analyst
15-RF1-51	Felt Paper (Light Grey)	35%	Chrysotile	50%	06/22	AC
			Cellulose Fibers	40%		
			Binders / Fillers	10%		
	Tar Paper (Black)	65%	Cellulose Fibers	85%		
			Tar Binders	15%		
15-RF1-52	Felt Paper (Light Grey)	60%	Chrysotile	50%	06/22	AC
			Cellulose Fibers	40%		
			Binders / Fillers	10%		
	Tar Paper (Black)	40%	Cellulose Fibers	85%		
			Tar Binders	15%		
15-RF1-53	Felt Paper (Light Grey)	50%	Chrysotile	50%	06/22	AC
			Cellulose Fibers	40%		
			Binders / Fillers	10%		
	Tar Paper (Black)	50%	Cellulose Fibers	85%		
			Tar Binders	15%		

Terracon

Asbestos Bulk Sample Log & Chain of Custody Form

Lab Use Only: 17B-06936 PLM53

Lab Location:

Naperville: 135 Ambassador Dr., Naperville, IL 60540 (630) 717 4263

Page 1 of ____

Project Name:	Historic Building	Project Number:	11177119	Project Manager:	
Project Address:	578 Howe Road	City/State / Zip:	Chesterton, IN	Email Results To:	
Site/Building:	Brick House				

Sample Identification HA # - BS Code - Sample #	Written location where bulk sample is collected	HA General Location	Material Description (Color/Texture/Etc.)	Quantity (SF, LF, CF, Units)	NESHAP Category[1]	Condition[2]/ Notes
1 - FT2 - 01	Kitchen 100	Kitchen 100	12"x12" Yellow floor tile	80SF	F C1 C2	G D SD
- - 02	↓					
- - 03	↓					
2 - MG5 - 04	Kitchen 100	Kitchen 100	4"x4" Yellow ceramic wall tile brown Adhesive	80SF	F C1 C2	G D SD
- - 05	↓					
- - 06	↓					
3 - FT2 - 07	Living Room 101	Living Room 101 (stair landing); 2nd floor addition 202	9"x9" wood pattern (Dark) floor tile	40SF	F C1 C2	G D SD
- - 08	↓					
- - 09	2nd floor addition 202					
4 - FT1 - 10	Addition 202	2nd floor addition 202	9"x9" wood pattern (Light) floor tile	40SF	F C1 C2	G D SD
- - 11	↓					
- - 12	↓					
5 - FT1 - 13	Bedroom 200	Bedroom 200	9"x9" dark red floor tile	140SF	F C1 C2	G D SD
- - 14	↓					
- - 15	↓					

Sampling Date: 6/14/2017 Collected by (print): Joseph T. Keen Inspector's Signature:

Relinquished by: Date/Time: 6/14/2017 Received by: Date/Time 6.15.17 10:04AM

Analysis: PLM EPA 600/R-93/116 ☒ PLM 400 Point Count ☐ TEM ☐ Other _____

Turnaround Time: 6 Hrs ☐ 24 Hrs ☐ 2 Days ☐ 3 Days ☐ 5 Days ☒ Other _____

Instructions:

Terracon ARMS: ☒ Stop Positive: ☐ Number of samples: _____

[1] F = Friable; C1 = Category I Nonfriable: packings, gaskets, resilient floor covering, and asphalt roofing products; C2 = Category II Nonfriable: any nonfrible material other than Category I Nonfriable

[2] G = Good (no damage); D = Damaged (<10% distributed or <25% localized); or SD = Significantly Damaged (>10% distributed or >25% localized)

Terracon

Asbestos Bulk Sample Log & Chain of Custody Form

Lab Use Only: 17B-06936

Lab Location:

Naperville: 135 Ambassador Dr., Naperville, IL 60540 (630) 717 4263

Site/Building:		Project Number:	

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Color/Texture/Etc.)	Quantity (SF, LF, CF, Units)	NESHAP Category[1]	Condition[2]/ Notes
6 - M67 - 16	Living Room 101 stairs	Living Room 101 (Stairs)	Yellow carpet [redacted]	60SF	F C1 C2	G D SD
- - 17	↓					
- - 18	↓					
7 - FT2 - 19	Bathroom 201	Bathroom 201	12"x12" multicolored floor tile	40SF	F C1 C2	G D SD
- - 20	↓					
- - 21	↓					
8 - FC1 - 22	Closet 201A	Closet 201 A	White linoleum sheet flooring	25SF	F C1 C2	G D SD
- - 23	↓					
- - 24	↓					
9 - FT2 - 25	Addition 102	Addition 102	12"x12" white floor tile	15SF	F C1 C2	G D SD
- - 26	↓					
- - 27	↓					
10 - FT2 - 28	Addition 102	Addition 102	12"x12" Tan floor tile	15SF	F C1 C2	G D SD
- - 29	↓					
- - 30	↓					
11 - FT2 - 31	Addition 102	Addition 102	12"x12" wood pattern floor tile	15SF	F C1 C2	G D SD
- - 32	↓					
- - 33	↓					

Relinquished by:	Date/Time:	Received by:	Date/Time:

Terracon

Asbestos Bulk Sample Log & Chain of Custody Form

Lab Use Only: 17B-06936

Lab Location:

Naperville: 135 Ambassador Dr., Naperville, IL 60540 (630) 717 4263

Site/Building: | Project Number:

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Color/Texture/Etc.)	Quantity (SF, LF, CF, Units)	NESHAP Category[1]	Condition[2]/ Notes
12 - SC1 - 34	Exterior window N.W	Exterior of window panes	white exterior window pane glazing	180LF	F C1 C2	G D SD
- - 35	↓ S.W					
- - 36	↓ N.E					
13 - HP1 - 37	Kitchen 100		plaster Wall w/ skim coat	4,500SF ~~3,000SF~~	F C1 C2	G D SD
- - 38	Living room 101					
- - 39	Addition 102					
- - 40	Bathroom 200			↓	F C1 C2	G D SD
- - 41	Bedroom 200					
- - 42	↓					
- - 43	Addition 202		↓		F C1 C2	G D SD
14 - HP3 - 44	Kitchen 100		plaster ceiling w/ skim coat			
- - 45	Living Room 101					
- - 46	Addition 102			~~2,000SF~~ 3,000SF	F C1 C2	G D SD
- - 47	Bathroom 200					
- - 48	Bedroom 200					
- - 49	↓				F C1 C2	G D SD
- - 50	Addition 202					
- -						

Relinquished by: Date/Time: | Received by: Date/Time:

Terracon

Asbestos Bulk Sample Log & Chain of Custody Form

Lab Use Only: 17B-06936

Lab Location:

Naperville: 135 Ambassador Dr., Naperville, IL 60540 (630) 717 4263

Page _____ of _____

Site/Building: | Project Number:

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Color/Texture/Etc.)	Quantity (SF, LF, CF, Units)	NESHAP Category[1]	Condition[2]/ Notes
15 - RF1 - 51	Attic	Under shingles	Roof felt paper & tar paper	1,500SF	F C1 C2	G D SD
- - 52	"					
- - 53	"					
- -					F C1 C2	G D SD
- -						
- -						
- -					F C1 C2	G D SD
- -						
- -						
- -					F C1 C2	G D SD
- -						
- -						
- -					F C1 C2	G D SD
- -						
- -						
- -					F C1 C2	G D SD
- -						
- -						
- -					F C1 C2	G D SD

Date/Time: | Received by: | Date/Time:

APPENDIX D

LEAD PAINT XRF SUMMARY

XRF LEAD RESULTS

Inspector: Terri Lewis Project: Bailly Homestead Date: 6/14/17
Project #: 11177119 Location: Main House (HS-18) Brick House (HS-19)

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
SRM 2573	n/a	n/a	Red	n/a	1.0	
SRM 2573	n/a	n/a	Red	n/a	1.1	
SRM 2573	n/a	n/a	Red	n/a	1.1	
Exterior Brick Home 'A' wall	Left Window	Wood	Gray	Poor	2.7	Positive
	Window trim				.22	Negative
	Window sill				0	
	Window frame				3.6 ~~2.5~~	Positive
	Right Window trim				.24	Negative
	Window sill				.24	
	Window frame				0	
'C' wall	Covered window	Plywood			0	
'D' wall	Ext. Vent	Metal			.08	
'A' wall	Door frame (center)	Wood			0	
	Door				0	
	Threshold				0	
	Door frame (outer)				0	
Exterior Main House A wall	Window frame		Brown	Fair	1.3	Positive
	Window trim				.01	Negative
	Window sill				.01	
	Siding trim				0	
	Siding		Cream		.01	
	Porch flr apron		Gray	Poor	0	
	Porch floor		Brown		0	
	Porch Railing		Cream	Fair	0	
	Porch Columns				0	
	Screen door		Brown		.02	
	Door trim				.01	
	Door		Stain		0	

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
(Ext) Main House A Wall	Threshold	Wood	Brown	Poor	.12	Negative
(111) Porch	9 panel Window frame			Fair	6.3	Positive
	Window trim				4.3	Positive
	Window Sill				2.8	Positive
(105) B Wall	Basement Window frame				.30	Negative
	Window trim				4.2	Positive
	Window Sill				2.3	Positive
	1st floor Window frame				4.1	Pos
	Wind. trim				2.7	Pos
	Wind. Sill				3.2	Pos.
Basement	Door				0	Negative
	Door frame				0	↓
	Window frame				.01	
	Window trim				0	
	Window Sill				0	
(107) C Wall	Wind. frame				1.5	Pos.
	Wind trim				3.4	Pos.
	Wind Sill				4.2	Pos.
(103)	Wind frame				0	Negative
	Wind trim				.01	↓
	Wind Sill				.06	
D Wall	Door				0	
	Door frame				0	↓
	Window frame				1.8	Pos
	Window trim				0	Negative

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
(Ext) Main House D Wall	Wind. Sill	Wood	Brown	Fair	.02	Negative
(102)	Wind. Basement frame				.7	↓
	Wind trim				9.8	Pos.
	Wind Sill				4.0	Pos.
Basement (101)	Door				.30	Negative
	~~Door~~ frame				1.4	Pos.
	Threshold			Poor	32.5	Pos.
C Wall	Backdoor		Stain	Fair	0	Negative
	trim		Brown	Poor	.05	↓
	threshold		↓	↓	.04	↓
~~(303)~~ A Wall	Siding		Peach		9.6	Pos.
	Ledge		Brown		1.1	Pos
	Window frame				1.8	Pos
	trim				4.9	Pos
↓	Sill	↓	↓	↓	6.8	Pos
(303) B Wall C	B Wall	Plaster	White		.06	Negative
	C Wall				0	↓
	Wire Covering	Wood			2.1	Pos
↓	Door trim	~~Wood~~	Stain	Fair	.05	Negative
	Baseboard	↓	↓	↓	.04	↓
(301)	A Wall	~~Plaster~~ Drywall	Green	Poor	.13	
	B Wall	Plaster	↓	↓	.14	
	C Wall	↓			.8	
	D Wall	↓	↓		.7	↓
↓	Door frame	Wood	White	↓	7.8	Pos.

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Mainhouse (301)	Corner Cabinette	Wood	White	Poor	13.7	Pos
	Shelf	↓	↓	↓	6.6	Pos
	Baseboard	↓	↓	↓	9.8	Pos
	Pipe	Metal	↓	↓	.4	Negative
	Tub	Cast iron	↓	↓	.09	↓
(302)	Sink	↓	↓	↓	16.4	Pos.
(B+C wall plaster gone)	A Wall	Plaster	↓	↓	3.6	Pos.
	B Wall	↓	↓	↓	2.5	Pos.
	Door	Wood	↓	↓	4.7	Pos.
	Door frame	↓	↓	↓	10.5	Pos.
	Window frame	↓	↓	↓	6.6	Pos
	trim	↓	↓	↓	11.8	Pos
	Sill	↓	Brown	↓	1.3	Pos
	toilet	Cast iron	White	↓	2.9	Pos
	Pipe	Metal	↓	↓	.8	Negative
(304A)	A Wall	Plaster	Green	↓	.02	↓
	B Wall	↓	↓	↓	.01	↓
	C Wall	↓	↓	↓	0	↓
	D Wall	↓	↓	↓	.04	↓
(304A)	Closet trim	Wood	Stain	Fair	.03	↓
(304)	A Wall	Plaster	~~White~~ tan	Poor	.04	↓
↓	B Wall	↓	↓	↓	.01	↓
↓	C Wall	↓	White	↓	.01	↓
↓	Door	Wood	Stain	Fair	.06	↓
↓	Door frame	↓	↓	↓	.04	↓

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Main House (305)	A Wall	Plaster	White	Poor	.01	Negative
	Door	Wood	Stain	Fair	.04	
	trim				.03	
	Window frame		Brown	Poor	.05	
	Sill				.02	
	trim		Stain		.04	
(300)	A Wall	Plaster	Blue		.01	
	B Wall				.02	
	C Wall				.01	
	Wall				.02	
	Railing	Wood	Stain	Fair	.02	
2nd flr. porch east Exterior (203)	Window frame		Brown	Poor	1.5	Pos.
	trim				.4	Negative
	Sill				.6	
(204)	Window frame				3.2	Pos.
	trim				3.4	Pos.
	Sill				4.8	Pos.
	Railing				0	Negative
	Column		White	Fair	0	
	Siding			Poor	0	
	Ceiling				.02	
	Screen door		Brown		2.0	Pos
	trim				1.3	Pos
	threshold				.4	Negative
	Door		Stain	Fair	.03	

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Main house Interior (303A)	Window Frame	Wood	Brown	Poor	5.5	Pos.
	trim		Stain		.04	Negative
	sill		Brown		5.4	Pos.
Interior (303B)	Frame				4.9	Pos.
	trim		Stain		0	Negative
	sill		Brown		4.5	Pos.
Interior (301A)	Frame		White		18.2	Pos
	trim				8.4	Pos
	Sill				13.1	Pos
tub room	Frame				8.5	Pos
	trim				10.9	Pos.
	Sill				13.0	Pos.
(304)	Exterior Frame		Brown		.30	Negative
	trim		Stain		.05	
	Sill		Tan		.7	
(201A)	Frame		White		4.0	Pos
	trim				9.5	Pos
	Sill				.06	Negative
	A Wall	Plaster			.30	
	Baseboard	Wood			9.0	Pos
	Door frame				13.1	Pos
	trim				22.6	Pos
	Threshold				13.2	Pos.
	Ceiling	Plaster			.02	Negative
(201)	C Wall		Blue		.01	

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Main House (201)	D Wall	Wood	Stain	Fair	.02	Negative
	Floor	↓	Gray	Poor	1.9	Pos.
	Window frame		White	Fair	10.1	Pos
	trim		↓	↓	22.7	Pos.
	Sill	↓	↓	↓	21.3	Pos.
	Baseboard	↓	Gray	↓	23.5	Pos.
	~~Door~~ frame	↓	↓	↓	7.3	Pos
(202A)	B Wall	Plaster	↓	Poor	.01	Negative
	Window frame	Wood	Brown	↓	~~3.3~~ 3.1	Pos
	trim	↓	↓	↓	3.1	Negative
	Sill	↓	↓	↓	.16	↓
	Ceiling	Plaster	White	↓	2.3	~~Pos~~
(202)	A Wall	↓	Wall Paper	↓	.07	Negative
	Ceiling	↓	White	↓	.14	↓
	Window frame	Wood	Brown	↓	.10	↓
	trim	↓	↓	↓	3.8	Pos
	sill	↓	↓	↓	1.0	Pos
	Floor vent	Metal	Black	↓	.01	Negative
	Wire covering	Wood	White	↓	.19	↓
	Baseboard	↓	Stain	↓	.10	↓
(203)	A Wall	~~Plaster~~	Wall paper	↓	.30	↓
	Ceiling	plaster	Pink	↓	.26	↓
(201)	Window Frame	Wood	Brown	↓	.30	↓
	trim	↓	↓	↓	3.0	Pos
	Sill	↓	↓	↓	.01	Negative

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Main House (203)	(200) Window frame	Wood	Brown	Poor	.08	Negative
	trim				1.6	Pos
	Sill				.09	Negative
	(208) Window frame				.24	↓
	trim				3.7	Pos
	Sill				.01	Negative
	Floor vent	Metal	Black		4.2	Pos
	Wire Cover	Wood	White		1.6	Pos
West porch 2nd flr	Siding			Fair	.01	Negative
	~~Screw~~ door	Metal	Brown		0	↓
	Door frame	Wood			2.4	Pos
	Railing				.01	Negative
	Floor		~~Gray~~		0	
	Ceiling		White		0	
	Door trim		Brown		.02	
(203A)	B Wall		Stain	Intact	0	
	Ceiling				0	
(200)	A Wall	Plaster	Wall Paper	Poor	.04	
	Ceiling		White		.05	
	Wire cover	Wood			.26	
(101)	A Wall	~~Plaster~~ Plaster			.12	
	Ceiling	Drywall			.01	
	Fireplace mantle	Wood	Stain	Fair	.01	
	Fireplace tile (flr)	Ceramic	Glaze		.02	
	Waste Surround in SE corner	Plaster	White		.01	

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
(101) A Wall	Log inside of plaster wall	Wood	White	Poor	0	Negative
B Wall					0	
(104)	A Wall		Stain	Intact	.06	
	Ceiling				.19	
	Fireplace Mantle				.05	
	Fireplace Surround	Brick	~~Tan~~ Brown	Poor	1.7	Pos
	Fireplace tile (flr)	Ceramic			2.3	Pos
B Wall	Wall Vent	Metal	White	Poor	3.7	Pos
B Wall	Painted board behind paneling	Wood	Green		8.7	Pos
(100)	B Wall	Plaster	Tan		.07	Negative
	Ceiling	~~Ceiling~~	White		0	
	Door frame	Wood	Stain	Intact	.09	
(102)	B Wall	Plaster	Tan	Poor	.03	
	Ceiling		Blue		.02	
	Door frame	Wood	Stain	Intact	.08	
(003)	Door frame		White	Poor	2.5	Positive
	& ~~Door frame~~		Mustard		14.3	Positive
	Door trim		White		3.8	Positive
(002)	C Wall	Brick	Gray		.03	Negative
	D Wall	Rock	White		.05	
	Window Frame	Wood			.5	
	trim				.04	
	~~Door~~				3.0	Positive
	frame				4.7	Positive
	trim				3.8	Positive

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Main House (001)	A Wall	Brick	White	Poor	.06	Negative
	B Wall	Rock	Gray		.02	↓
	C Wall	Brick	Yellow		2.5	Pos.
	B Wall	Wood Wainscot	Tan		.14	Negative
	C Wall	↓	White		.09	↓
	D Wall	Plaster	↓		4.6	Pos.
	↓	Rock			.01	Negative
Fireplace →		Brick	Orange		.09	
(004)	A Wall	Drywall	White	Fair	0	
(001)	Beam (S) (Center)	Metal	Brown		11.3	Pos.
↓	↓	↓	Green		.01	Negative
↓	↓ (N)	↓	Brown	↓	5.9	Pos.
↓	Ceiling	Drywall	White	↓	0	Negative
Frame unpainted (005)	Door	Wood	↓	↓	.09	
↓	A Wall	Plaster	Gray	Poor	.26	
	Window trim	Wood	White	↓	.08	
↓	Sill	↓	↓	↓	.04	
↓	Arched Door frame	↓	↓	↓	.08	
↓	trim	↓	↓	↓	.15	
▽	A Wainscot Wall	↓	↓	↓	.11	↓
Stairs	D Wall	Plaster	Tan	↓	13.6	Pos
↓	Wire Cover	Wood	Tan	↓	5.3	Pos
Basement	Fireplace Mantle	↓	White	↓	.03	.01
N. side	Siding	↓	Tan	↓		

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Brick House (202) (106) A Wall	Window frame	Wood	Gray	Poor	.03	Negative
B Wall	trim	↓	↓	↓	2.5	Positive
	Sill	↓	↓	↓	.06	Negative
(105) B Wall	Frame	↓	↓	↓	.10	↓
	trim	↓	↓	↓	3.1	Pos
	Sill	↓	↓	↓	.10	Negative
(104)	Frame	↓	↓	↓	0	↓
	trim	↓	↓	↓	4.1	Pos
	Sill	↓	↓	↓	.06	Negative
(103) C Wall	Frame	↓	↓	↓	.03	↓
	trim	↓	↓	↓	1.7	Pos
	Sill	↓	↓	↓	.09	Negative
	A Wall	Plaster	White	↓	.15	↓
	Ceiling	↓	↓	↓	.03	↓
	Window trim	Wood	↓	↓	.09	↓
	Sill	↓	↓	↓	.04	↓
	Baseboard	↓	↓	↓	.06	↓
	heater	Metal	↓	↓	.02	↓
	Door frame	Wood	↓	↓	.10	↓
	trim	↓	↓	↓	.11	↓
(200)	A Wall	Plaster	Yellow	↓	.03	↓
	Ceiling	↓	White	↓	.04	↓
	Window frame	Wood	Gray		0	↓
	trim	↓	↓		2.9	Pos
	Sill	↓	↓		.10	Negative

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
(200)	Railing	Wood	White	Poor	4.9	Pos
D Wall	Window frame		Gray		7.5	Pos
	trim				2.0	Pos
	Sill				.21	Negative
	frame				6.4	Pos
	trim				1.9	Pos
	Sill				.27	Negative
	Baseboard		White		9.4	Pos
	Window trim				1.2	Pos
	Sill				3.0	Pos
(201)	tub	Cast iron			13.4	Pos
	toilet				3.3	Pos
	sink				13.5	Pos
B Wall		Plaster	Green		.05	Negative
Ceiling					1.9	Pos
D Wall	Window Frame	Wood	Gray		3.8	Pos
	trim				2.7	Pos
	Sill				.17	Negative
	Window trim		~~White~~ Green		2.7	Pos
	Sill				1.6	Pos
(201A)	Door frame				2.9	Pos
	trim				4.6	Pos
C Wall		Plaster			.19	Negative
Ceiling					.09	
Shelf Support		Wood			.06	

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Brick House (201A)	Shelf	Wood	Green	Poor	.09	Negative
(102)	A Wall	Plaster	Pink		.02	
	Ceiling		White		0	
A Wall	Window frame	Wood	Gray		.11	
	trim				3.0	Pos
	Sill				.25	Negative
B Wall	frame				.10	
	trim				2.7	Pos
	Sill				.30	Negative
	frame				.04	
	trim				3.0	Pos
	Sill				.20	Negative
	Window trim		White		.09	
	Sill				.13	
	Door frame				.07	
	trim				.06	
	Baseboard				.15	
	heater	Metal			.01	
(101)	A Wall	Plaster	Blue		.01	
	Ceiling		White		.02	
A Wall	Window frame	Wood	Gray		0	
	trim				2.1	Pos
	Sill				.16	Negative
	Stair Stringer		Tan		.14	
	riser				.26	

XRF LEAD RESULTS

Inspector: _____ Project: _____ Date: _____

Project #: _____ Location: _____

Sample Location (Room)	Component	Substrate	Color	Condition	Results (mg/cm2)	Classification Positive/Negative
Brick House (100)	A Wall	Plaster	Tan	Poor	.01	Negative
	Ceiling	↓	↓	↓	.03	↓
	Door frame	Wood	White		.12	
	↓ trim	↓	↓		.21	
C Wall	Window frame		Gray		0	
	trim		↓		1.6	Positive
	↓ sill		↓		.4	Negative
	Window trim		White		9.2	Positive
	↓ Sill		↓		3.0	↓
	Baseboard	↓			.11	Negative
	↓ heater	Metal	↓	↓	.11	↓
	C Wall	Plaster	Yellow	↓	.09	↓
Post	calibration				1.0	
	↓				1.0	
					0.9	

APPENDIX E

XRF PERFORMANCE CHARACTERISTICS SHEETS

Performance Characteristic Sheet

EFFECTIVE DATE: **September 24, 2004** **EDITION NO.: 1**

MANUFACTURER AND MODEL:

Make: *Niton LLC*
Tested Model: *XLp 300*
Source: ^{109}Cd
Note: This PCS is also applicable to the equivalent model variations indicated below, for the Lead-in-Paint K+L variable reading time mode, in the XLi and XLp series:

XLi 300A, XLi 301A, XLi 302A and XLi 303A.
XLp 300A, XLp 301A, XLp 302A and XLp 303A.
XLi 700A, XLi 701A, XLi 702A and XLi 703A.
XLp 700A, XLp 701A, XLp 702A, and XLp 703A.

Note: The XLi and XLp versions refer to the shape of the handle part of the instrument. The differences in the model numbers reflect other modes available, in addition to Lead-in-Paint modes. The manufacturer states that specifications for these instruments are identical for the source, detector, and detector electronics relative to the Lead-in-Paint mode.

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Lead-in-Paint K+L variable reading time mode.

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm^2 (inclusive)

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm^2 in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm^2 film).

If readings are outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instruments into control before XRF testing proceeds.

SUBSTRATE CORRECTION:

For XRF results using Lead-in-Paint K+L variable reading time mode, substrate correction is <u>not</u> needed for:

Brick, Concrete, Drywall, Metal, Plaster, and Wood

INCONCLUSIVE RANGE OR THRESHOLD:

K+L MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm^2)
Results not corrected for substrate bias on any substrate	Brick	1.0
	Concrete	1.0
	Drywall	1.0
	Metal	1.0
	Plaster	1.0
	Wood	1.0

BACKGROUND INFORMATION

EVALUATION DATA SOURCE AND DATE:

This sheet is supplemental information to be used in conjunction with Chapter 7 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* ("HUD Guidelines"). Performance parameters shown on this sheet are calculated from the EPA/HUD evaluation using archived building components. Testing was conducted in August 2004 on 133 testing combinations. The instruments that were used to perform the testing had new sources; one instrument's was installed in November 2003 with 40 mCi initial strength, and the other's was installed June 2004 with 40 mCi initial strength.

OPERATING PARAMETERS:

Performance parameters shown in this sheet are applicable only when properly operating the instrument using the manufacturer's instructions and procedures described in Chapter 7 of the HUD Guidelines.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Substrate correction is not needed for brick, concrete, drywall, metal, plaster or wood when using Lead-in-Paint K+L variable reading time mode, the normal operating mode for these instruments. If substrate correction is desired, refer to Chapter 7 of the HUD Guidelines for guidance on correcting XRF results for substrate bias.

EVALUATING THE QUALITY OF XRF TESTING:

Randomly select ten testing combinations for retesting from each house or from two randomly selected units in multifamily housing. Use the K+L variable time mode readings.

Conduct XRF retesting at the ten testing combinations selected for retesting.

Determine if the XRF testing in the units or house passed or failed the test by applying the steps below.

Compute the Retest Tolerance Limit by the following steps:

Determine XRF results for the original and retest XRF readings. Do not correct the original or retest results for substrate bias. In single-family housing a result is defined as the average of three readings. In multifamily housing, a result is a single reading. Therefore, there will be ten original and ten retest XRF results for each house or for the two selected units.

Calculate the average of the original XRF result and retest XRF result for each testing combination.

Square the average for each testing combination.

Add the ten squared averages together. Call this quantity C.

Multiply the number C by 0.0072. Call this quantity D.

Add the number 0.032 to D. Call this quantity E.

Take the square root of E. Call this quantity F.

Multiply F by 1.645. The result is the Retest Tolerance Limit.

Compute the average of all ten original XRF results.

Compute the average of all ten re-test XRF results.

Find the absolute difference of the two averages.

If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, this procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection should be considered deficient.

Use of this procedure is estimated to produce a spurious result approximately 1% of the time. That is, results of this procedure will call for further examination when no examination is warranted in approximately 1 out of 100 dwelling units tested.

TESTING TIMES:

For the Lead-in-Paint K+L variable reading time mode, the instrument continues to read until it is moved away from the testing surface, terminated by the user, or the instrument software indicates the reading is complete. The following table provides testing time information for this testing mode. The times have been adjusted for source decay, normalized to the initial source strengths as noted above. Source strength and type of substrate will affect actual testing times. At the time of testing, the instruments had source strengths of 26.6 and 36.6 mCi.

Testing Times Using K+L Reading Mode (Seconds)						
	All Data			Median for laboratory-measured lead levels (mg/cm^2)		
Substrate	25^{th} Percentile	Median	75^{th} Percentile	Pb < 0.25	0.25 ≤ Pb<1.0	1.0 ≤ Pb
Wood Drywall	4	11	19	11	15	11
Metal	4	12	18	9	12	14
Brick Concrete Plaster	8	16	22	15	18	16

CLASSIFICATION RESULTS:

XRF results are classified as positive if they are greater than or equal to the threshold, and negative if they are less than the threshold.

DOCUMENTATION:

A document titled *Methodology for XRF Performance Characteristic Sheets* provides an explanation of the statistical methodology used to construct the data in the sheets, and provides empirical results from using the recommended inconclusive ranges or thresholds for specific XRF instruments. For a copy of this document call the National Lead Information Center Clearinghouse at 1-800-424-LEAD.

This XRF Performance Characteristic Sheet was developed by the Midwest Research Institute (MRI) and QuanTech, Inc., under a contract between MRI and the XRF manufacturer. HUD has determined that the information provided here is acceptable when used as guidance in conjunction with Chapter 7, Lead-Based Paint Inspection, of HUD's *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

APPENDIX F

LEAD SOIL LABORATORY ANALYTICAL REPORT(S)

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations: IEPA ELAP 100445; ORELAP IL300001; AIHA-LAP, LLC 101160; NVLAP LabCode 101202-0

June 23, 2017

Terracon Consultants, Inc.
135 Ambassador Drive
Naperville, IL 60540
Telephone: (630) 717-4263
Fax: (630) 357-9489

Analytical Report for STAT Work Order: 17060497 Revision 0

RE: 11177119, Bailly Homestead, Main House

Dear Terri Lewis:

STAT Analysis received 8 samples for the referenced project on 6/15/2017 10:43:00 AM. The analytical results are presented in the following report.

All analyses were performed in accordance with the requirements of 35 IAC Part 186 / NELAC standards. Analyses were performed in accordance with methods as referenced on the analytical report. Those analytical results expressed on a dry weight basis are also noted on the analytical report.

All analyses were performed within established holding time criteria, and all Quality Control criteria met EPA or laboratory specifications except when noted in the Case Narrative or Analytical Report. If required, an estimate of uncertainty for the analyses can be provided. A listing of accredited methods/parameters can also be provided.

Thank you for the opportunity to serve you and I look forward to working with you in the future. If you have any questions regarding the enclosed materials, please contact me at (312) 733-0551.

Sincerely,

Frank Capoccia
Project Manager

The information contained in this report and any attachments is confidential information intended only for the use of the individual or entities named above. The results of this report relate only to the samples tested. If you have received this report in error, please notify us immediately by phone. This report shall not be reproduced, except in its entirety, unless written approval has been obtained from the laboratory. This analytical report shall become property of the Customer upon payment in full. Otherwise, STAT will be under no obligation to support, defend or discuss the analytical report.

STAT Analysis Corporation

Date: June 23, 2017

Client: Terracon Consultants, Inc.
Project: 11177119, Bailly Homestead, Main House
Work Order: 17060497 Revision 0

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
17060497-001A	A1 / S.W Main House		6/14/2017	6/15/2017
17060497-002A	A2 / S.E Main House		6/14/2017	6/15/2017
17060497-003A	B1 / S.E Main House		6/14/2017	6/15/2017
17060497-004A	B2 / N.E Main House		6/14/2017	6/15/2017
17060497-005A	C1 / N.E Main House		6/14/2017	6/15/2017
17060497-006A	C2 / N.W Main House		6/14/2017	6/15/2017
17060497-007A	D1 / S.W Main House		6/14/2017	6/15/2017
17060497-008A	D2 / N.W Main House		6/14/2017	6/15/2017

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Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Date Reported: June 23, 2017
Date Printed: June 23, 2017

ANALYTICAL RESULTS

Client: Terracon Consultants, Inc.
Project: 11177119, Bailly Homestead, Main House **Work Order:** 17060497 Revision 0

Lab ID: 17060497-001 **Collection Date** 6/14/2017
Client Sample ID: A1 / S.W Main House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	1000	0.52		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	15.0	0.2	*	wt%	1	6/19/2017

Lab ID: 17060497-002 **Collection Date** 6/14/2017
Client Sample ID: A2 / S.E Main House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	1300	0.49		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	9.8	0.2	*	wt%	1	6/19/2017

Lab ID: 17060497-003 **Collection Date** 6/14/2017
Client Sample ID: B1 / S.E Main House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	640	0.49		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	9.8	0.2	*	wt%	1	6/19/2017

Lab ID: 17060497-004 **Collection Date** 6/14/2017
Client Sample ID: B2 / N.E Main House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	1100	0.49		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	11.2	0.2	*	wt%	1	6/19/2017

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

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Date Reported: June 23, 2017
Date Printed: June 23, 2017

ANALYTICAL RESULTS

Client: Terracon Consultants, Inc.
Project: 11177119, Bailly Homestead, Main House **Work Order:** 17060497 Revision 0

Lab ID: 17060497-005 **Collection Date** 6/14/2017
Client Sample ID: C1 / N.E Main House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	860	0.47		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	7.6	0.2	*	wt%	1	6/19/2017

Lab ID: 17060497-006 **Collection Date** 6/14/2017
Client Sample ID: C2 / N.W Main House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	360	0.50		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	9.7	0.2	*	wt%	1	6/19/2017

Lab ID: 17060497-007 **Collection Date** 6/14/2017
Client Sample ID: D1 / S.W Main House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	540	0.59		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	22.5	0.2	*	wt%	1	6/19/2017

Lab ID: 17060497-008 **Collection Date** 6/14/2017
Client Sample ID: D2 / N.W Main House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	2900	0.48		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	8.3	0.2	*	wt%	1	6/19/2017

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

STAT Analysis Corporation
2242 W. Harrison, Suite 200, Chicago, Illinois 60612 Phone: (312) 733-0551 Fax: (312) 733-2386
e-mail address: STATinfo@STATAnalysis.com

CHAIN OF CUSTODY RECORD

Page : 1 of 1

Client: Terracon Consultants, Inc.
Street Address: 135 Ambassador Dr.
City, State, Zip: Naperville, IL
Phone: (630) 445-0161
Fax: (630) 357-9489
e-mail/Alt. Fax: terri.lewis@terracon.com
Project Number: 11177119
Project Name: Bailly Homestead
Project Location: Main house
Project Manager: Terri Lewis
P.O. Number:

Turn Around: 4 Hrs: ☐ 8 Hrs: ☐ 24 Hrs: ☐ 1 Day: ☐ 2 Days: ☐ 3 Days: ☐ 5 Days: ☒
Date Due: Time Due: Note: Not all turn around times are available for all analysis.

OFFICE USE ONLY BELOW:
Batch No.: 1706097
Samples Acceptable: Yes: ☒ No: ☐
Checked by (Initial/Date): FC 6/23/17
QC by (Initial/Date):
Reported By (Initial/Date/Time/Method):
Comments:

Relinquished by: Terri Lewis Date/Time: 6/14/17
Received by: 670741919472 Date/Time: FedEx
Relinquished by: FedEx Date/Time:
Received by: Date/Time: 6/15/17 10:43
Relinquished by: Date/Time:
Received by: Date/Time:

Client Sample Number/Description:	Date Taken	Time On	Time Off	Rate (lpm)	Volume (Liters)	Area Wiped (ft^2)	Laboratory Sample No.	Lead Air	Lead Ambient Air	Lead Based Paint	Lead Soil	Lead Drinking Water	Lead Waste Water	Lead Wipe		TCLP Lead	TCLP RCRA Metals		Dust NIOSH 500	Dust NIOSH 600		Hexavalent Chromium		Other:
A1 / S.W Main house	6/14/17						001				X													
A2 / S.E Main house	"						002				X													
B1 / S.E Main house	"						003				X													
B2 / N.E Main house	"						004				X													
C1 / N.E Main house	"						005				X													
C2 / N.W Main house	"						006				X													
D1 / S.W Main house	"						007				X													
D2 / N.W Main house	"						008				X													

Comments:

STAT Analysis Corporation

Sample Receipt Checklist

Client Name TERRACON-NAPERVILLE

Date and Time Received: 6/15/2017 10:43:00 AM

Work Order Number 17060497

Received by: JNW

Checklist completed by: Signature 6/15/17 Date

Reviewed by: MK Initials 6/15/17 Date

Matrix:

Carrier name FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑	
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels/containers?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Container or Temp Blank temperature in compliance?	Yes ☑	No ☐	Temperature Ambient °C	
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☐	No ☐	
Water - Samples pH checked?	Yes ☐	No ☐	Checked by:	
Water - Samples properly preserved?	Yes ☐	No ☐	pH Adjusted?	

Any No response must be detailed in the comments section below.

Comments:

Client / Person contacted: Date contacted: Contacted by:

Response:

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
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June 23, 2017

Terracon Consultants, Inc.
135 Ambassador Drive
Naperville, IL 60540
Telephone: (630) 717-4263
Fax: (630) 357-9489

Analytical Report for STAT Work Order: 17060498 Revision 0

RE: 11177119, Bailly Homestead, Brick House

Dear Terri Lewis:

STAT Analysis received 8 samples for the referenced project on 6/15/2017 10:43:00 AM. The analytical results are presented in the following report.

All analyses were performed in accordance with the requirements of 35 IAC Part 186 / NELAC standards. Analyses were performed in accordance with methods as referenced on the analytical report. Those analytical results expressed on a dry weight basis are also noted on the analytical report.

All analyses were performed within established holding time criteria, and all Quality Control criteria met EPA or laboratory specifications except when noted in the Case Narrative or Analytical Report. If required, an estimate of uncertainty for the analyses can be provided. A listing of accredited methods/parameters can also be provided.

Thank you for the opportunity to serve you and I look forward to working with you in the future. If you have any questions regarding the enclosed materials, please contact me at (312) 733-0551.

Sincerely,

Frank Capoccia
Project Manager

The information contained in this report and any attachments is confidential information intended only for the use of the individual or entities named above. The results of this report relate only to the samples tested. If you have received this report in error, please notify us immediately by phone. This report shall not be reproduced, except in its entirety, unless written approval has been obtained from the laboratory. This analytical report shall become property of the Customer upon payment in full. Otherwise, STAT will be under no obligation to support, defend or discuss the analytical report.

STAT Analysis Corporation

Date: June 23, 2017

Client: Terracon Consultants, Inc.
Project: 11177119, Bailly Homestead, Brick House
Work Order: 17060498 Revision 0

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
17060498-001A	A1 / S.W. Brick House		6/14/2017	6/15/2017
17060498-002A	A2 / S.E. Brick House		6/14/2017	6/15/2017
17060498-003A	B1 / S.E. Brick House		6/14/2017	6/15/2017
17060498-004A	B2 / N.E. Brick House		6/14/2017	6/15/2017
17060498-005A	C1 / N.E. Brick House		6/14/2017	6/15/2017
17060498-006A	C2 / N.W. Brick House		6/14/2017	6/15/2017
17060498-007A	D1 / S.W. Brick House		6/14/2017	6/15/2017
17060498-008A	D2 / N.W. Brick House		6/14/2017	6/15/2017

STAT Analysis Corporation
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Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Date Reported: June 23, 2017
Date Printed: June 23, 2017

ANALYTICAL RESULTS

Client: Terracon Consultants, Inc.
Project: 11177119, Bailly Homestead, Brick House **Work Order:** 17060498 Revision 0

Lab ID: 17060498-001 **Collection Date** 6/14/2017
Client Sample ID: A1 / S.W. Brick House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	50	0.44		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	3.3	0.2	*	wt%	1	6/19/2017

Lab ID: 17060498-002 **Collection Date** 6/14/2017
Client Sample ID: A2 / S.E. Brick House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	58	0.47		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	5.2	0.2	*	wt%	1	6/19/2017

Lab ID: 17060498-003 **Collection Date** 6/14/2017
Client Sample ID: B1 / S.E. Brick House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	71	0.43		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	1.4	0.2	*	wt%	1	6/19/2017

Lab ID: 17060498-004 **Collection Date** 6/14/2017
Client Sample ID: B2 / N.E. Brick House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	68	0.45		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	1.1	0.2	*	wt%	1	6/19/2017

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

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Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Date Reported: June 23, 2017
Date Printed: June 23, 2017

ANALYTICAL RESULTS

Client: Terracon Consultants, Inc.
Project: 11177119, Bailly Homestead, Brick House **Work Order:** 17060498 Revision 0

Lab ID: 17060498-005 **Collection Date** 6/14/2017
Client Sample ID: C1 / N.E. Brick House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	78	0.46		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	2.0	0.2	*	wt%	1	6/19/2017

Lab ID: 17060498-006 **Collection Date** 6/14/2017
Client Sample ID: C2 / N.W. Brick House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	82	0.44		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	1.6	0.2	*	wt%	1	6/19/2017

Lab ID: 17060498-007 **Collection Date** 6/14/2017
Client Sample ID: D1 / S.W. Brick House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	54	0.48		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	6.9	0.2	*	wt%	1	6/19/2017

Lab ID: 17060498-008 **Collection Date** 6/14/2017
Client Sample ID: D2 / N.W. Brick House **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS	**SW6020 (SW3050B)**			Prep Date: **6/21/2017**		Analyst: **JG**
Lead	53	0.43		mg/Kg-dry	10	6/22/2017
Percent Moisture	**D2974**			Prep Date: **6/16/2017**		Analyst: **KKA**
Percent Moisture	3.7	0.2	*	wt%	1	6/19/2017

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

STAT Analysis Corporation
2242 W. Harrison, Suite 200, Chicago, Illinois 60612 Phone: (312) 733-0551 Fax: (312) 733-2386
e-mail address: STATinfo@STATAnalysis.com

CHAIN OF CUSTODY RECORD

Client: Terracon Consultants, Inc.
Street Address: 135 Ambassador Dr.
City, State, Zip: Naperville, IL
Phone: (630) 445-0161
Fax: (630) 357-9489
e-mail/Alt. Fax: terri.lewis@terracon.com
Project Number: 11177119
Project Name: Bailly Homestead
Project Location: Brick House
Project Manager: Terri Lewis
P.O. Number:

Turn Around: 4 Hrs: ☐ 8 Hrs: ☐ 24 Hrs: ☐ 1 Day: ☐ 2 Days: ☐ 3 Days: ☐ 5 Days: ☒
Date Due: Time Due: Note: Not all turn around times are available for all analysis.

OFFICE USE ONLY BELOW:
Batch No.: 1706498
Samples Acceptable: Yes: ☒ No: ☐
Checked by (Initial/Date): EC 6/23/17
QC by (Initial/Date):
Reported By (Initial/Date/Time/Method):
Comments:

Relinquished by: Terri Lewis Date/Time: 6/14/17
Received by: 679474819472 Date/Time: Fedex
Relinquished by: FedEx Date/Time:
Received by: Dan Stanga Date/Time: 6/15/17 10:43
Relinquished by: Date/Time:
Received by: Date/Time:

Client Sample Number/Description:	Date Taken	Time On	Time Off	Rate (lpm)	Volume (Liters)	Area Wiped (ft^2)	Laboratory Sample No.	Lead Air	Lead Ambient Air	Lead Based Paint	Lead Soil	Lead Drinking Water	Lead Waste Water	Lead Wipe		TCLP Lead	TCLP RCRA Metals		Dust NIOSH 500	Dust NIOSH 600		Hexavalent Chromium		Other:
A1 / S.W Brick House	6/14/17						001				X													
A2 / S.E Brick House							002				X													
B1 / S.E Brick house							003				X													
B2 / N.E. Brick house							004				X													
C1 / N.E. Brick house							005				X													
C2 / N.W. Brick house							006				X													
D1 / S.W Brick house							007				X													
D2 / N.W Brick house							008				X													

Comments:

STAT Analysis Corporation

Sample Receipt Checklist

Client Name TERRACON-NAPERVILLE

Date and Time Received: 6/15/2017 10:43:00 AM

Work Order Number 17060498

Received by: JNW

Checklist completed by: _____ 6/15/17
Signature Date

Reviewed by: MK 6/15/17
Initials Date

Matrix: Carrier name Client Delivered

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels/containers?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container or Temp Blank temperature in compliance?	Yes ☑	No ☐	Temperature Ambient °C
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☐	No ☐
Water - Samples pH checked?	Yes ☐	No ☐	Checked by:
Water - Samples properly preserved?	Yes ☐	No ☐	pH Adjusted?

Any No response must be detailed in the comments section below.

Comments: _____

Client / Person contacted: _____ Date contacted: _____ Contacted by: _____

Response: _____

APPENDIX G

PERSONNNEL & LABORATORY LICENSES/CERTIFICATIONS

Indiana Department of Environmental Management
100 N. Senate Avenue
Mail Code 61-52 IGCN 1003
Indianapolis, IN 46204-2251

August 10, 2016

Joseph T. Keca
2417 Millpond Ct.
Plainfield IL 60586

Re: Asbestos Inspector # 19A005978

Based upon the review of your license application, the Office of Air Quality has determined that you have fulfilled the requirements of 326 IAC 18 and are eligible for licensing in the following discipline:

Asbestos Inspector

Your Asbestos Inspector license is attached below. The license is waterproof and tear resistant. Please sign your license and do not laminate or alter your license in anyway. Your license must be available for review at all times while implementing an asbestos project. This license may be revoked, pursuant to 326 IAC 18-1-7, if you:

(1) Violate any requirements of these rules (326 IAC 18), 326 IAC 14-10, or any requirement of the Asbestos-Containing Materials in Schools Rule or any other federal, state, or local regulation pertaining to asbestos in buildings or to asbestos projects.
(2) Falsify information on your application for licensing.
(3) Fail to meet any qualifications specified in 326-IAC 18-1-4.
(4) Conduct asbestos project, or related asbestos handling activity, in a manner which is hazardous to the public health.

Your license is valid effective 08/27/2016, and will expire on 08/27/2017, as indicated on your card. We suggest that you attend the required training and submit an application for license renewal early to insure your license does not lapse. NOTE: 326 IAC 18-1-4(h) and 326 IAC 18-1-6(e) require that any individual who has an eighteen (18) month lapse between any two training courses of the same discipline to attend an initial training course for the discipline in which they are seeking a license. In order to avoid re-taking the initial training course you must have attended a refresher in the discipline you are seeking a license within eighteen (18) months from the date of issuance of your last training course certificate.

Office of Air Quality, Asbestos Licensing Section (317) 233-3861

Indiana Dept. of Environmental Management

Joseph T. Keca

Asbestos Inspector License #: 19A005978

Effective: **08/27/2016**	Expiration: **08/27/2017**
Birth Date: **04/20/1989**	Gender: **M**
Height: **5-08**	Eye Color: **Brown**
Weight: **160**	Hair Color: **Brown**

AMERISAFE INC.

Asbestos Building Inspector Refresher

THIS CERTIFIES THAT

Joseph Keca

Has successfully completed the IL & IN Approved Asbestos Training Course and passed the Examination for purposes of accreditation under section 206 of Title II of the Toxic Substances Control Act (TSCA). Conducted by the Amerisafe Training Services, 3990 Enterprise Court, Aurora IL 60504. (630) 862-2650

CLASS DATES: 8/5/2016

LOCATION: Amerisafe

EXAMINATION: 8/5/2016

EXPIRATION: 8/5/2017

CERTIFICATE NUMBER: 108290X16S103574

2016

OCCUPATIONAL TRAINING & SUPPLY, INC.

7233 S. Adams Street ♦ Willowbrook, IL 60527 ♦ (630) 655-3900

Lead Risk Assessor Refresher

Occupational Training & Supply, Inc. certifies that

Terri Lewis

has successfully completed the Lead Risk Assessor Refresher course and has passed the competency exam with a minimum score of 70%. This course is accredited by the Illinois Department of Public Health in accordance with the Illinois Lead Poisoning Prevention Code.

Course Date: 10/12/2016

Exam Date: 10/12/2016

Expiration Date: 10/12/2019

Certificate Number: LRAR1610123844

Kathy DeSalvo

Kathy DeSalvo, Director

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 102056-0

Steve Moody Micro Services, LLC

Farmers Branch, TX

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2017-07-01 through 2018-06-30

Effective Dates

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Steve Moody Micro Services, LLC
2051 Valley View Lane
Farmers Branch, TX 75234-8956
Mr. Bruce Crabb
Phone: 972-241-8460 Fax: 972-241-8461
Email: bruce.crabb@moodylabs.com
http://www.moodylabs.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 102056-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- Appendix E to Subpart E of Part 763 -- Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

May 19, 2017

Mark Nelson
HI-TEK Environmental, Inc. dba STAT Analysis Corp
STAT Analysis Corporation
2242 W. Harrison Suite 200
Chicago, IL 60612

NVLAP Lab Code: 101202-0

Dear Mark Nelson,

Thank you for continuing your accreditation for Asbestos Fiber Analysis under the National Voluntary Laboratory Accreditation Program (NVLAP). This accreditation is effective until June 30, 2018, provided that your laboratory continues to comply with the accreditation requirements contained in the NVLAP Procedures.

Your updated accreditation documents are enclosed. You may reproduce these documents in their entirety and use the NVLAP symbol and/or term to reference your accredited status in accordance with the requirements published in NIST Handbook 150, 1.8. Accreditation does not relieve your laboratory from observing and complying with any applicable existing laws and/or regulations.

We are pleased to have you participate in NVLAP and look forward to your continued association with this program. If you have any questions concerning your NVLAP accreditation, please direct them to Hazel Richmond, Program Manager, Laboratory Accreditation Program, National Institute of Standards and Technology, 100 Bureau Dr. Stop 2140, Gaithersburg, MD 20899-2140; (301) 975-3024.

Sincerely,

Dana S. Leaman, Chief
National Voluntary Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101202-0

STAT Analysis Corporation

Chicago, IL

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2017-07-01 through 2018-06-30

Effective Dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Voluntary Laboratory Accreditation Program

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

STAT Analysis Corporation
STAT Analysis Corporation
2242 W. Harrison Suite 200
Chicago, IL 60612
Mark Nelson
Phone: 312-733-0551
Email: mnelson@statanalysis.com
http://www.STATAnalysis.com

ASBESTOS FIBER ANALYSIS **NVLAP LAB CODE 101202-0**

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- Appendix E to Subpart E of Part 763 -- Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

Effective 2017-07-01 through 2018-06-30

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

STAT Analysis Corporation

2242 West Harrison St. Suite 200, Chicago, IL 60612-3501

Laboratory ID: 101160

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories* in the following:

LABORATORY ACCREDITATION PROGRAMS

✓	**INDUSTRIAL HYGIENE**	Accreditation Expires: March 01, 2018
✓	**ENVIRONMENTAL LEAD**	Accreditation Expires: March 01, 2018
✓	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: March 01, 2018
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2005 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Gerald R Schultz

Gerald Schultz, CIH
Chairperson, Analytical Accreditation Board

Cheryl O. Morton

Cheryl O. Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision 14: 03/26/2014

Date Issued: 02/29/2016

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

STAT Analysis Corporation
2242 West Harrison St. Suite 200, Chicago, IL 60612-3501

Laboratory ID: **101160**
Issue Date: 02/29/2016

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Industrial Hygiene Laboratory Accreditation Program (IHLAP)

Initial Accreditation Date: 08/01/1992

IHLAP Scope Category	Field of Testing (FoT) (FoTs cover all relevant IH matrices)	Technology sub-type/ Detector	Published Reference Method/Title of In-house Method	Method Description or Analyte *(for internal methods only)*
Chromatography Core	Gas Chromatography	GC/FID	NIOSH 1400	
			NIOSH 1500	
			NIOSH 1501	
			NIOSH 2000	
			NIOSH 5503	
			OSHA 07	
		GC/ECD	NIOSH 1400	
			NIOSH 1500	
			NIOSH 1501	
			NIOSH 2000	
			NIOSH 5503	
			OSHA 07	
	GC/MS		NIOSH 5515	
Spectrometry Core	Atomic Absorption	CVAA	NIOSH 6009	
	Inductively-Coupled Plasma	ICP/MS	NIOSH 7300	
Asbestos/Fiber Microscopy Core	Phase Contrast Microscopy (PCM)		NIOSH 7400	

A complete listing of currently accredited Industrial Hygiene laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

STAT Analysis Corporation
2242 West Harrison St. Suite 200, Chicago, IL 60612-3501

Laboratory ID: **101160**
Issue Date: 02/29/2016

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

The EPA recognizes the AIHA-LAP, LLC ELLAP program as meeting the requirements of the National Lead Laboratory Accreditation Program (NLLAP) established under Title X of the Residential Lead-Based Paint Hazard Reduction Act of 1992 and includes paint, soil and dust wipe analysis. Air analysis is not included as part of the NLLAP.

Environmental Lead Laboratory Accreditation Program (ELLAP)

Initial Accreditation Date: 03/09/1998

Field of Testing (FoT)	Technology sub-type/ Detector	Method	Method Description *(for internal methods only)*
Paint		EPA SW-846 3050B	
		NIOSH 7082	
Soil		EPA SW-846 3050B	
		NIOSH 7082	
Settled Dust by Wipe		EPA SW-846 3050B	
		NIOSH 7082	
Airborne Dust		NIOSH 7082	

A complete listing of currently accredited Environmental Lead laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

STAT Analysis Corporation
2242 West Harrison St. Suite 200, Chicago, IL 60612-3501

Laboratory ID: **101160**
Issue Date: 02/29/2016

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Environmental Microbiology Laboratory Accreditation Program (EMLAP)

Initial Accreditation Date: 04/01/2004

EMLAP Category	Field of Testing (FoT)	Method	Method Description *(for internal methods only)*
Fungal	Air - Culturable	SOP 6120	In-House: Analysis of Culturable Microbiological Air Samples
	Bulk - Culturable	SOP 6220	In-House: Analysis of Culturable Microbiological Swab and Bulk Samples
	Surface - Culturable	SOP 6220	In-House: Analysis of Culturable Microbiological Swab and Bulk Samples
	Air - Direct Examination	SOP 6110	In-house: Analysis of Non-Culturable Air Samples
	Bulk - Direct Examination	SOP 6210	In-House: Analysis of Non-Culturable Microbiological Samples by Direct Examination.
	Surface - Direct Examination	SOP 6210	In House: Analysis of Non-Culturable Microbiological Samples by Direct Examination.

A complete listing of currently accredited Environmental Microbiology laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org



Chapel interior. (STRATA 2017)

H TREATMENT ALTERNATIVES WORKSHOP

STRATA
ARCHITECTURE + PRESERVATION

TREATMENT ALTERNATIVES WORKSHOP NOTES

Bailly Homestead
Indiana Dunes National Lakeshore, Porter, Indiana
Bailly Homestead Cultural Landscape/Historic Structures Report Project
Project # P17PD00598

August 28, 2017
9:00 AM, CST, Workshop

Greetings and Introductions

Workshop Attendees
Paul Labovitz, NPS INDU, Superintendent
Chris Pergiel, NPS INDU, Deputy Superintendent
Judith Collins, NPS INDU, Historical Architect, Compliance Coordinator
Dan Plath, NPS INDU, Chief of Resource Management
Agustin Perez Maldonado, NPS INDU, Civil Engineer
Ron Griffin, NPS INDU
Paul Stratton, NPS INDU
Kim Swift, NPS INDU
Lynda Lancaster, NPS INDU
Al O'Bright, NPS Midwest Regional Office, Historical Architect
Marla McEnaney, NPS Midwest Regional Office, Historical Landscape Architect (Phone)
Todd Zeiger, Director, Indiana Landmarks
Debra Parcell, Community Preservation Specialist, Indiana Landmarks
Angie Gaebler, STRATA Architecture + Preservation
Claire Ashbrook, STRATA Architecture + Preservation
Greg De Vries, Landscape Architect, Quinn Evans Architects
Philip Steed, Structural Engineering Associates, Inc.

Workshop Focus and Goals
These meeting notes document the treatment alternatives workshop held on August 28, 2017 at Indiana Dunes National Lakeshore (INDU). The purpose of the workshop was to review the relevant historic and comparative information, discuss rehabilitation issues for the Bailly Homestead Site, Main House and Outbuildings, and develop a preferred treatment use for the site and buildings for further exploration.

Project Scope and Issues
Review of the Project Scope of Work objectives. Refer to slide.

Review of Report Draft and Project Progress
Angie Gaebler, Greg De Vries and Philip Steed provided a brief introduction to the workshop, which included: site orientation; a summary of the consultant's work completed to date; research of the history of the Bailly Homestead property, landscape and buildings; documentation of physical conditions of the Site, Main House and Outbuildings; and analysis of structural integrity of the Main House and Outbuildings.

Archival Research / History / Timeline
Historic photos juxtaposed to present day photos of the Baily Homestead were shown. Debbie Sheals, architectural historian, produced a timeline map indicating the assumed locations of structures throughout time. The findings provided a foundation for developing treatment alternatives for the Site, the Main House and the outbuildings.

In addition to the dates outlined on the map and historic photographs, the following was discussed:

- Angie identified that there are a couple buildings on the north side of the property that are present in historic photos, but are not identified in any found research or documentation of the site.
- The Team has identified that the tool shed was used for multiple uses throughout time.
- In 1907 the Main House was raised and placed on a stone foundation that is present today.
- The logistics involved with the movement of the Brick House to its present location may indicate that the ravine to the east of the Brick House was historically not as dramatic of a drop as it is today.

Site Orientation / Character & Contributing Features / Access
Greg reviewed research the CLR team has compiled of the Bailly Homestead site. This research included the historic use of the land, landscape character defining features, and oral history of the landscape and its features. The following was discussed:

- Historic location of Bailly orchards and fields, which indicates that there was a clear separation from domestic land and farm land. The Park indicated that there is no knowledge of anyone looking for remnants of the large Bailly orchards that grew north of the Homestead.
- Frances Howe's preference that the Homestead was referred to as an "estate" rather than a "farm."
- The location of the Wedding Trees. The depictions of Gina Darnell were also referenced. Through historic photographs that indicated concrete was used to stabilize the Wedding Trees, Greg determined that the wedding trees were not the ones that Gina had indicated as fallen into the river.
- The legend of the historic bridge that crossed the Little Calumet River was discussed. Historically it had been identified that the bridge was constructed from the 1893 World's Fair Ferris wheel. Todd, from Indiana Landmarks, indicated that this legend has been tied to several bridges in the area, but had been disproven because the radius was too small to have been a Ferris wheel.
- The integrity of site is diminished due to the loss of important landscape features including the farming fields, orchards, lower prairie, original bridge, landscaping around Main House, and loss of the Wedding Trees.

Buildings and Utilities
Angie Gaebler reviewed the existing conditions assessment for the Bailly Main House and Outbuildings, which included civil (utilities) and architectural analysis of the site. These will be further discussed in the report.

Structural
Philip Steed reviewed the existing structural conditions for the Bailly Main House and Outbuildings. This assessment included the floor framing, building movement, roof framing and observed issues. The following was discussed:

- Main House: Within the existing Living Room there is a jack post on either side of the fireplace. Currently the jack post is setting directly on the floor and although there are jack posts in the basement, they are not directly below the first-floor hack posts. This means there is no clear path of bearing below the first-floor jack posts and the basement slab.
- Main House: Within the existing Dining Room there is a column between the second floor and the first floor near the stair opening, but there is no path of bearing below column to the basement slab.
- Main House: There is significant deflection/creep occurring at the second and third-floor framing. This can most readily be seen within Bedroom 202 where the wallpaper pattern allows one to see deflection/creep in the third floor framing.
- Main House: Currently there are portions of the roof framing that are not tied back to the structural load-bearing walls. There are rafters bearing on non-structural walls that are supporting the weight of the roof, where there is no clear path of travel.
- Main House: Floor framing for the second and third floors are rotted in places. Beyond the deterioration, the existing floor framing design is not adequate for load created for public or private access and use.
- Main House: The first floor framing appears adequate for floor loading, due to the construction of the three steel beams supporting the first floor.
- Main House: The second and third floors of the house do not structurally 'check' to allow for continued use. The current live load capacity is negative. Therefore, tours and access to the second and third floors should not be allowed.
- Brick House: When entering the house there is a large gap in the floor that one must cross before entering the house where the floor framing and floor sheathing is deteriorated.
- Two-Story Log Cabin: Active insect deterioration is visible and second level framing layout is problematic at the stair wall.

Treatment Alternatives Workshop Goals
Angie Gaebler outlined the rehabilitation issues for the Site Main House and Outbuildings including impacts on historic integrity, site planning, site accessibility, building accessibility, building interior layout, MEP system requirements, and utility requirements.

Selecting A Treatment
It was identified by the Park that preserving the house and allowing public access was the priority for development of the site. Questions concerning how much modification where asked and Al O'Bright indicated that significant features of all the buildings needed to be identified. Angie Gaebler outlined the significant features, which included:

- Main House: wood flooring, plaster, wood trim, and room arrangements. The only space that had some flexibility with space rearranging was the basement.
- Site: viewsheds and site plan/arrangement and location of historic structures, major landscaping components, and driveways.
- Brick House: plaster, wood flooring, and wood trim.

Level of Significance: Bailly Homestead National Historic Landmark – Designated for "exceptional significance in American history" and properties important for interpretive

value may be candidates for Preservation or Restoration. However, Rehabilitation is the most commonly used treatment for the majority of historic buildings.

Physical Condition: Preservation appropriate if distinctive materials, features, and spaces are essentially intact and convey the building's historical significance. If the building requires more extensive repair and replacement, then Rehabilitation is probably the most appropriate treatment.

Proposed Use: Some historic buildings can be adapted to a new use or updated for continued use without seriously impacting their historic character. Other buildings require major alterations, resulting in loss of historic character and even integrity.

Code and Other Regulations: Regardless of the treatment, regulatory and life safety requirements must be addressed. Sensitive design approaches are important to protect historic materials and character.

INDU Mission Statement:
"to preserve for the educational, inspirational, and recreational use of the public certain portions of the Indiana Dunes and other areas of scenic, scientific, and historic interest and recreational value in the State of Indiana."

Brainstorming Potential Uses and Treatment Alternatives of Site:
Items to think about related to potential uses is budgeting (project $ versus operations $). The long term operational cost of reusing the buildings. Where would this $ come from? How would it be staffed?

Regional Amenities were outlined. These amenities, which may attract users, included:

- Birding
- Fishing
- Paddling/Kayaking/Paddling
- Photography
- Art and Artists
- Hiking – Short and Long-Distance Trails
- Camping
- Cross-country Skiing/ Snow shoeing
- French History
- Science/Research

In terms of the house and outbuildings, several general observations were made for pros and cons for the potential uses of the buildings, which include the following:

<u>Bed and Breakfast</u>

Pros:

- Saves the building and keeps the site alive and functioning.
- Believe there is a demand for this type of accommodations and would bring more people to the Park. It also has accessibility to bike trials and river trails, which would provide accommodations for people using the trails.
- It could easily be opened for tours.
- The function of the B&B could easily be overlapped with an event center.

Cons:

- May cause irreversible damage to the interior of house. This is specifically referencing what would be required to make the house accessible and to provide private bathrooms and required structural modifications.
- There are currently floor loading issues that would need to be addressed to open the upper floors to the public.
- It would require an outside group (vendor) to manage it.
- Could possibly limit general public's access to the site. Would need to be written into contract.
- Developing an ADA accessible bedroom could be difficult or impossible without destruction of the historic fabric.
- Would increase vehicular traffic in the area.
- Would have to provide sanitary sewer and utilities to the area that would be costly. (Would be required for most new uses)

House Museum

Cons:

- As a group, it was decided that there would not be enough interest in the house museum concept, and the Park could not afford to keep it running.

Wedding Venue / Event Venue

Pros:

- Less Intrusive than other options.
- Could provide accommodations for wedding party to stay on site.
- Provides a unique setting, which could help to draw people to the site.
- For renovations for the Chapel a partnership with local churches could be established to preserve/rehabilitate the structure.

Cons:

- Would a commercial kitchen be required? Could only provide a warming kitchen.
- Utilities and sanitary services would still be required, because bathrooms would be needed.
- Limited parking for larger weddings, which would require shuttles to bring guests that would be required to remotely park.
- There is lots of competition in the area that already provide event spaces/wedding spaces. May not be enough use as an exclusive wedding venue.

Campus Concept/ Individual Building Development

Pros:

- It would allow for small investors/increments of money to be required.
- The Park could focus on fixing one building at a time and getting one investor at a time.
- There are several possibilities for groups that could be interested (Chapel for weddings, Brick House used for Outfitters, Restaurants, and vending).
- It would start to develop a critical mass of people that would know about the site and would help to get traffic flowing, which would establish a following. This in turn would help draw other investors to the site.
- Could push for restoration of boat launch

Cons:

- Starting out there might not be enough foot traffic to get a business established at the site.

- The site is on a dead-end road, making drive-by traffic limited.
- Would increase the vehicular traffic and limited parking for the various vendors on the site.

Office Space for Partners

Pros:

- Nice to have all the Park Partners on site, but most Partners already have office space elsewhere.

Cons:

- Would require core elements (utilities, kitchen, restrooms).
- Is there a need and who would pay for the renovation of the buildings/site? Would rent be required?

Site and Buildings Rehabilitation Potential Limitations

When reviewing the proposed uses, the group discussed site and building limitations that would impact how the buildings and site were used. These limitations included:

- Due to landmark status, there may be limitations to what is allowable during rehabilitation to the structures.
- None of the buildings provide a large space to congregate. Thus, dependent on what the space is used for, the size of public gathering space would be limited.
- Accessibility for the site and individual buildings is required and will be challenging to achieve. Due to grade changes and multiple levels within the various buildings, accessible entrances will require creative planning.
- If rehabilitation to the buildings take place, the buildings will be required to meet current building codes and fire egress requirements.
- Limited utilities at the site.
- Limited room for on-site parking.
- Difficult site access for deliveries and trash removal, without re-grading and development of the site entrance.

Miscellaneous Notes

- Consider the hydrological impact of Burns Ditch and Port of Indiana on the river channel and ecology of the Bailly Homestead area.
- Agustin noted that there may be possible access changes within the Park. He noted that the Federal Highways Administration is going to recommend the closure of Oak Hill at US 12. He also noted that Oak Hill Road and Howe Road would require upgrading, because they currently do not have appropriate geometries to accommodate large quantities of public traffic (Min. 25' radius corners at Howe Road).
- The Park identified that it would be best if Bailly Homestead had limited ties to Goodfellow, due to security requirements for the children using the property.

Treatment Alternatives Workshop Summary

A final single preferred treatment of the Bailly Homestead and Outbuildings was not identified at this workshop. However, a clear direction, which includes the preservation and maintenance with a potential for future rehabilitation of the house and outbuildings for flexible type use, which would include overnight accommodations (such as a Bed and Breakfast), along with adaptable use for the buildings was clearly identified as an outcome.

All attendees expressed that the rehabilitation of the chapel to be able to be used for weddings and small performances was desired. The Park may look at potential partnerships to assist with fundraising and restoration efforts.

Due to the potential for new development and infill construction, Preservation Zones should be established for the Bailly Homestead Site. Preservation Zones are identified to protect historic site at varying levels, based on the current conditions and historic integrity. For example, Preservation Treatment Zone 1 may include the historic core of the site, while Preservation Treatment Zone 2 may include the portion of the site west of the driveway, while Preservation Zone 3 may include the north portion of the immediate site (circle drive). Preservation Zone 4 may include the fields. These will be identified in the CLR/HSR Report.

Overnight accommodations will require that the site be ADA accessible, as well as the primary service building and at least one rental bedroom. None of the buildings are easily made accessible without major alterations, which diminish the historic integrity of the buildings. Examples of these potential alterations were shown during the workshop, and attendees agreed that these were not acceptable to implement. The only exception is that the basement of the house may need to be made accessible. This is the only 'large' gathering space available and could be used for serving meals to guests and for other compatible uses, such as catering set-up, and cooking, canning or demonstration-type of classes.

ADA accessible overnight accommodations would best be made in a new structure. A new structure could be constructed 'in line' with the historic buildings, but outside the Preservation Treatment Zone 1 – in the north section of the property, just past the circle drive. This small building could be designed to blend with the historic fabric but be of clearly new construction.

A flat area to the west of the Chapel and Two-Story Log House could be used for event space and tent construction. This would give good access to the basement of the house for potential catering space in a small kitchen area.

A new comfort station was discussed that might be constructed at the north end of the property, closer to the trails. This could be used as a comfort station for overnight camping, as well. There was no consensus on whether there was a need for this at this time, as long as persons on the trail could use a public restroom at the Contact Station or another building on Bailly site.

Overnight camping was discussed. No consensus was made if this is a need. In the future, a potential location could be between the north field and the northwest parking lot, to the west of the existing trail.

Treatment recommendations that present a tiered approach to the preservation and maintenance of the Bailly Homestead Site, Main House and Outbuildings will be prepared as part of the overall Cultural Landscape Report and Historic Structures Report.

Bailly Homestead
Cultural Landscape and Historic Structures Report
Indiana Dunes National Lakeshore



NATIONAL PARK SERVICE

STRATA
ARCHITECTURE + PRESERVATION

QUINN EVANS
ARCHITECTS

Treatment Alternatives Workshop

Indiana Dunes National Lakeshore

Porter, Indiana - August 28, 2017



Workshop Day 1, 9:00 am – 12:00 pm

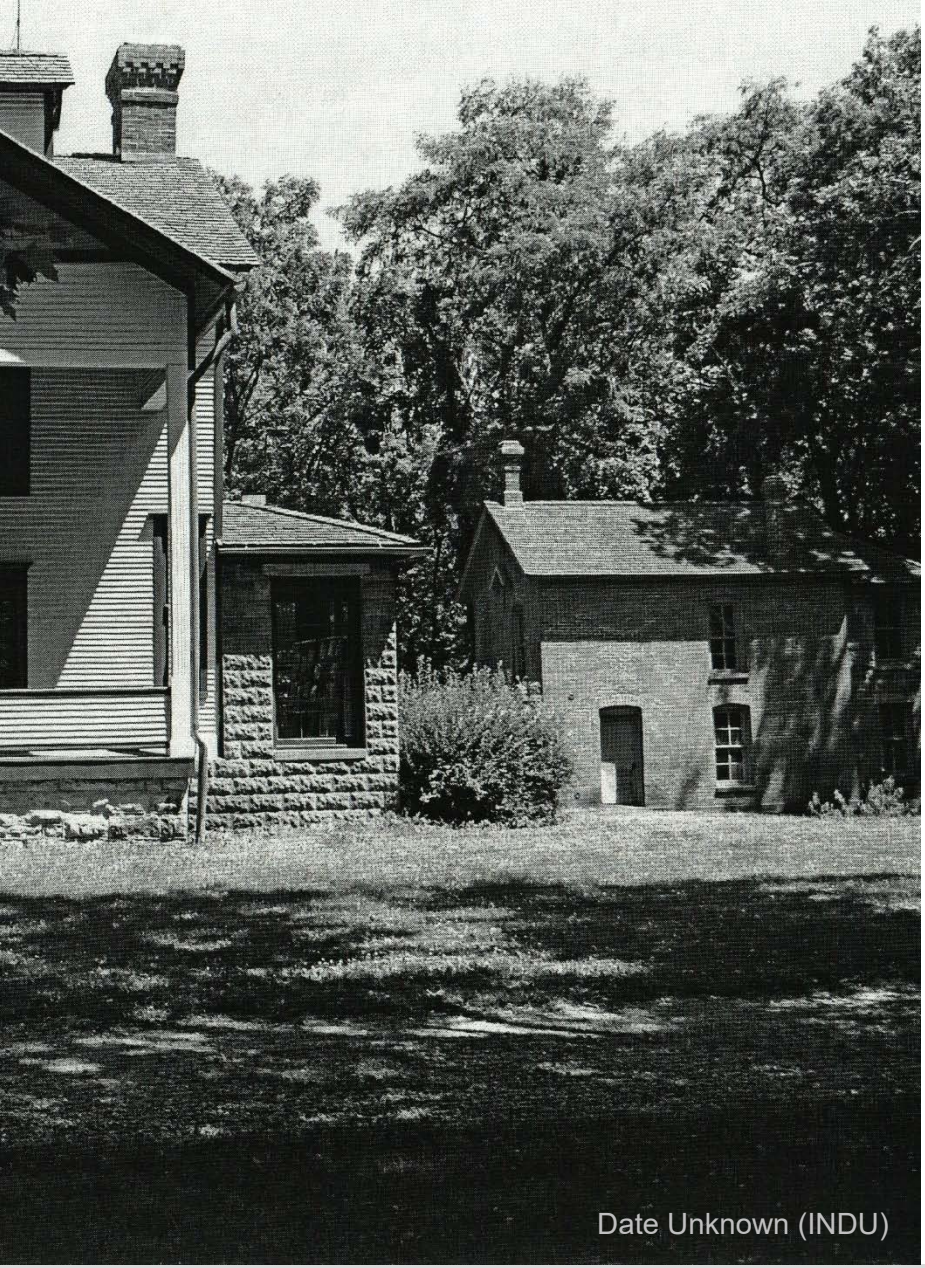
- Welcome
- Review of CLR/HSR Project and Progress
  - Site Visit in June 2017
  - Site Survey and Existing Conditions Drawings
  - Project Schedule
  - Archival Research / History / Timeline
- Homestead Overview / Site Orientation
  - Site Orientation / Character & Contributing features / Access
  - Buildings and Utilities
  - Structural
- Treatment Alternatives Workshop Goals
- SOI Treatment Approach
- INDU Mission Statement

Workshop Day 1, 1:15 pm – 4:00 pm

- Discuss Site Amenities
- Site and Access Limitations
- Brainstorming Use and Treatment Options
- What is required for a vendor use?
- Review and Discuss Use and Treatment Alternatives
- Next Steps and Action Items

CLR/HSR GOALS AND SIGNIFICANT PROJECT ISSUES:

1. *Document the buildings through measured drawings and photographs.*
2. *Determine historic chronology of the site and buildings.*
3. *Determine the conditions of each building.*
4. *Testing buildings for the presence of LBP and lead in soil, as well as potential asbestos containing materials.*
5. *Determine character defining features of the site and buildings.*
6. *The Park's goal is to rehabilitate the Main House interior and consider rehabilitating the Brick House, Chapel and 2-Story Log buildings (alternative uses are to be explored). Building codes and accessibility issues need to be carefully considered.*
7. *Determine a range of use alternatives for the Main House and Outbuildings based upon the feasibility of utility access, building codes, accessibility requirements and interior use program.*
8. *Determine the impacts of treatment alternatives and uses on site and building historic integrity and appearance.*


Date Unknown (INDU)

REVIEW OF DRAFT CLR/HSR AND PROJECT PROGRESS:

WORK TO DATE:

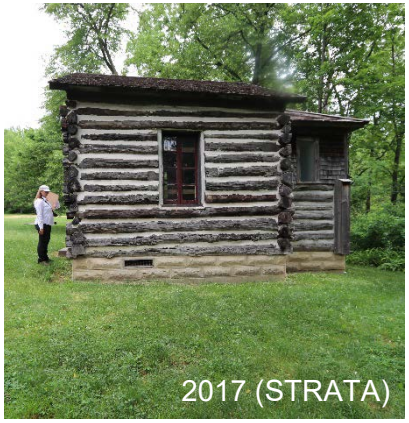
Our Design Team has completed the on-site survey which includes measuring, documenting and assessing the structures, site, and site utilities. Our team is currently working on the 80% draft Historic Structures and Cultural Landscape Report.













Site Visit: June 2017

CLR/HSR Project Deliverables Schedule

- May 2017 - Report Kick-off Conf. Call to Coordinate Site Visit
- June 2017 – Site Visit for Assessment / Beginning of Historic Research
- August 2017 – Workshop
- 80% Draft
  - Deliverables due to Park October 30.
- December 13 2017 – 80% Draft Report Comments received from park.
- 95% Draft Report
  - Deliverables due to Park February 23, 2018
- April 9 2018 – 95% Draft Report Comments received from park.
- End of May 2018 – Final Draft with Signature Page
- August 2018 – Final Reports Submitted



1958 Photograph



2017 (STRATA)

Historic Photos



1958 Photograph



2017 (STRATA)

Historic Photos





1958 Photograph



2017 (STRATA)

Historic Photos



1958 Photograph



2017 (QEA)

Historic Photos



1924 Photo Album INDU



2017 (STRATA)

Historic Photos



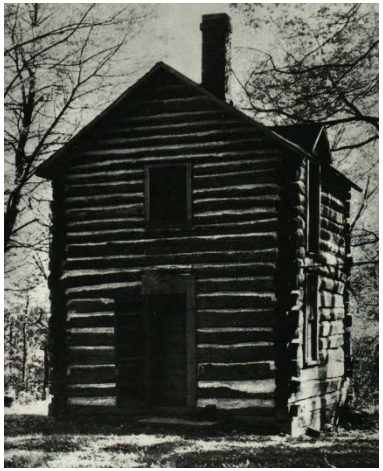




2-Story Log House HS-20



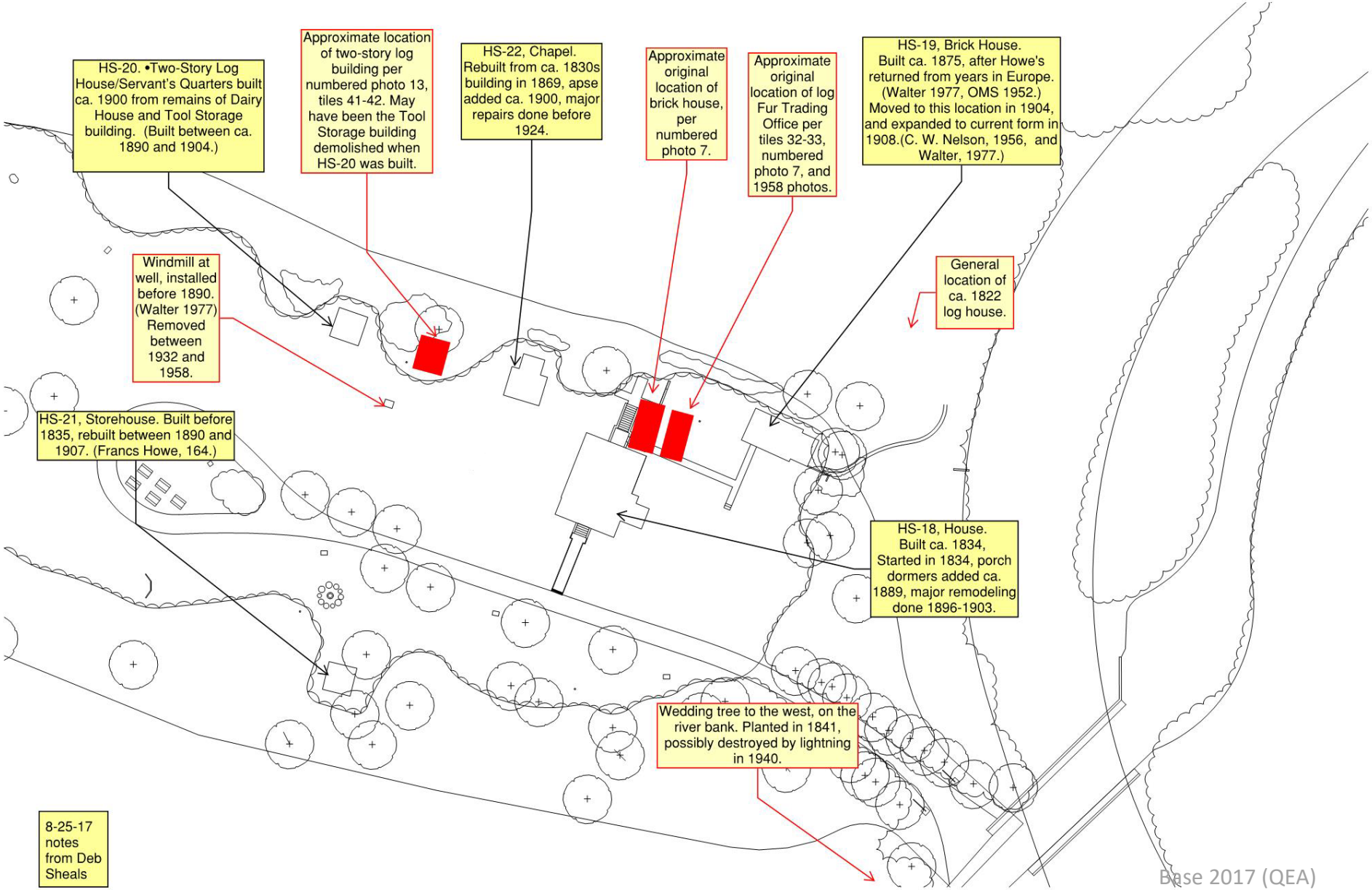
1924 Photo Album INDU



Date Unknown, INDU 103 box

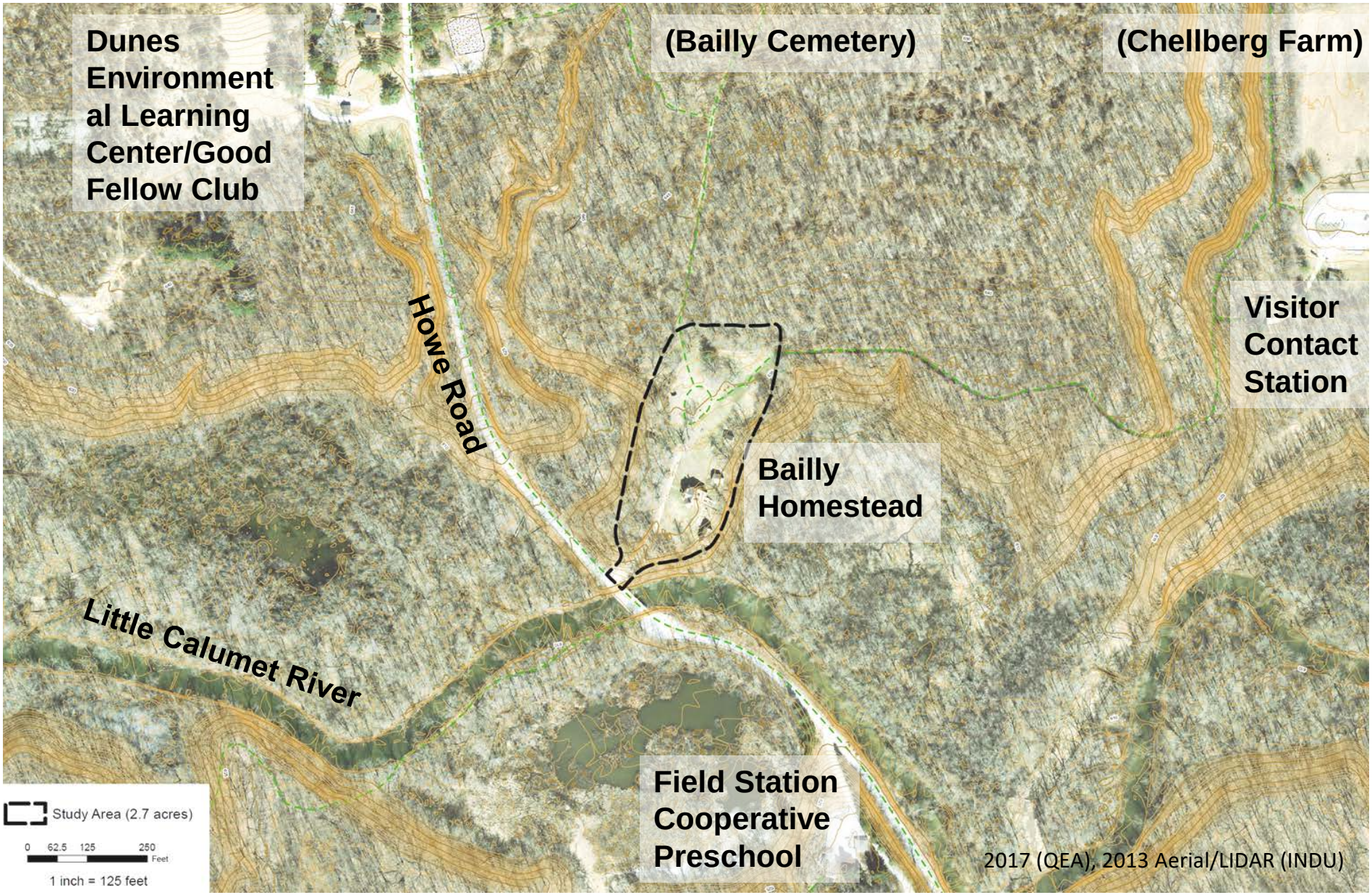


2017 (STRATA)



BAILLY HOMESTEAD CLR / HSR
INDIANA DUNES NATIONAL LAKESHORE
Treatment Alternatives Workshop - August 28, 2017

Historic Site Plan



BAILLY HOMESTEAD CLR / HSR
INDIANA DUNES NATIONAL LAKESHORE
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Bailly Homestead Site Context

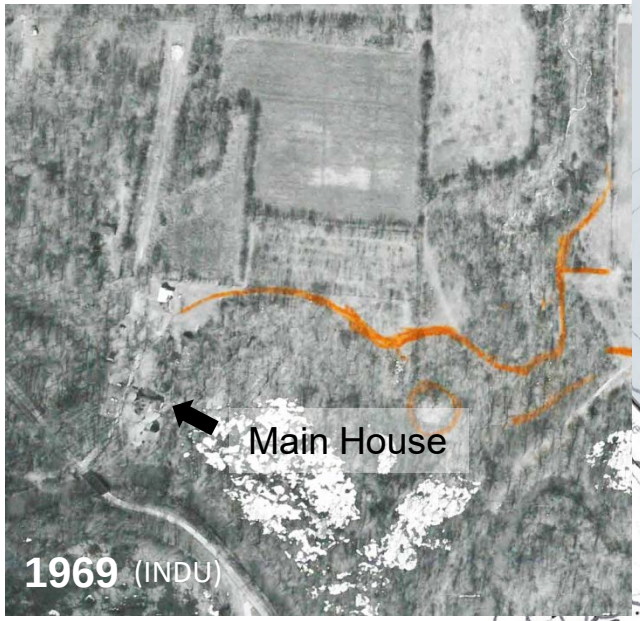


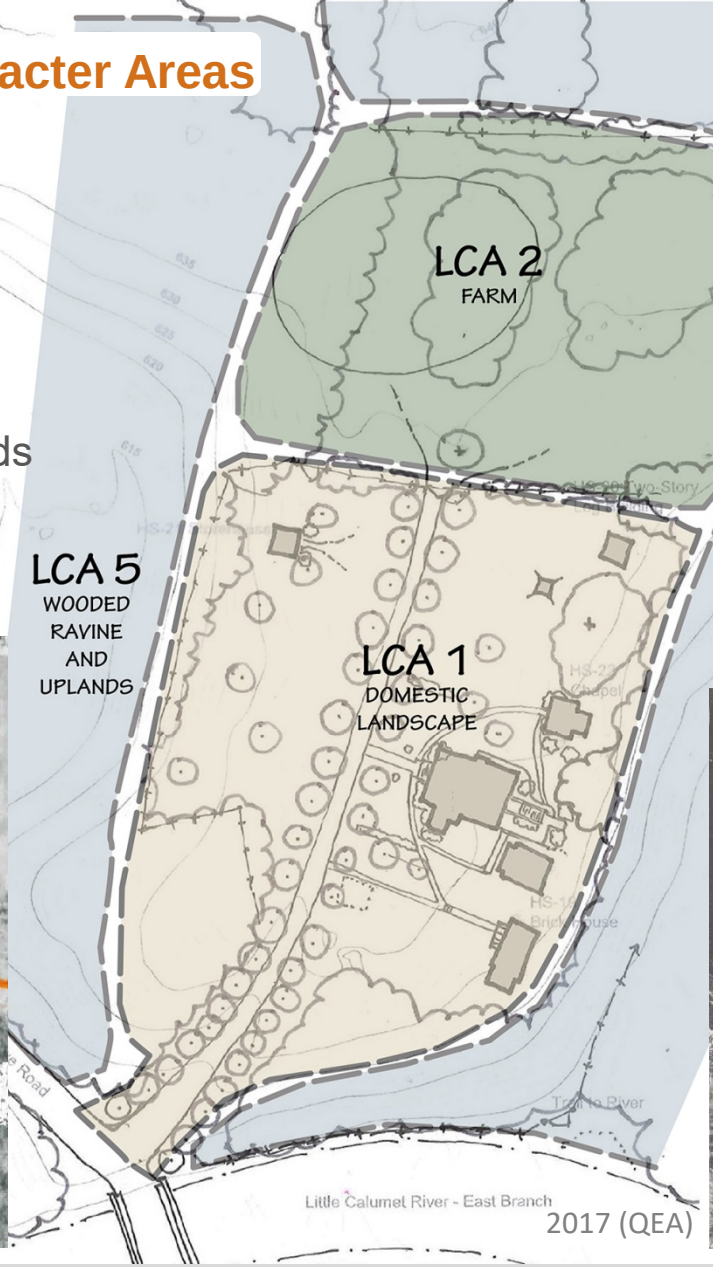
BAILLY HOMESTEAD CLR / HSR
INDIANA DUNES NATIONAL LAKESHORE
Treatment Alternatives Workshop - August 28, 2017

2017 Aerial Photograph

Historic Landscape Character Areas

1. Domestic Landscape
2. Farm
3. Fields and Orchard
4. Riverbank and Meadow
5. Wooded Ravine and Uplands







1917 Historic Landscape

Historic Landscape Character Areas

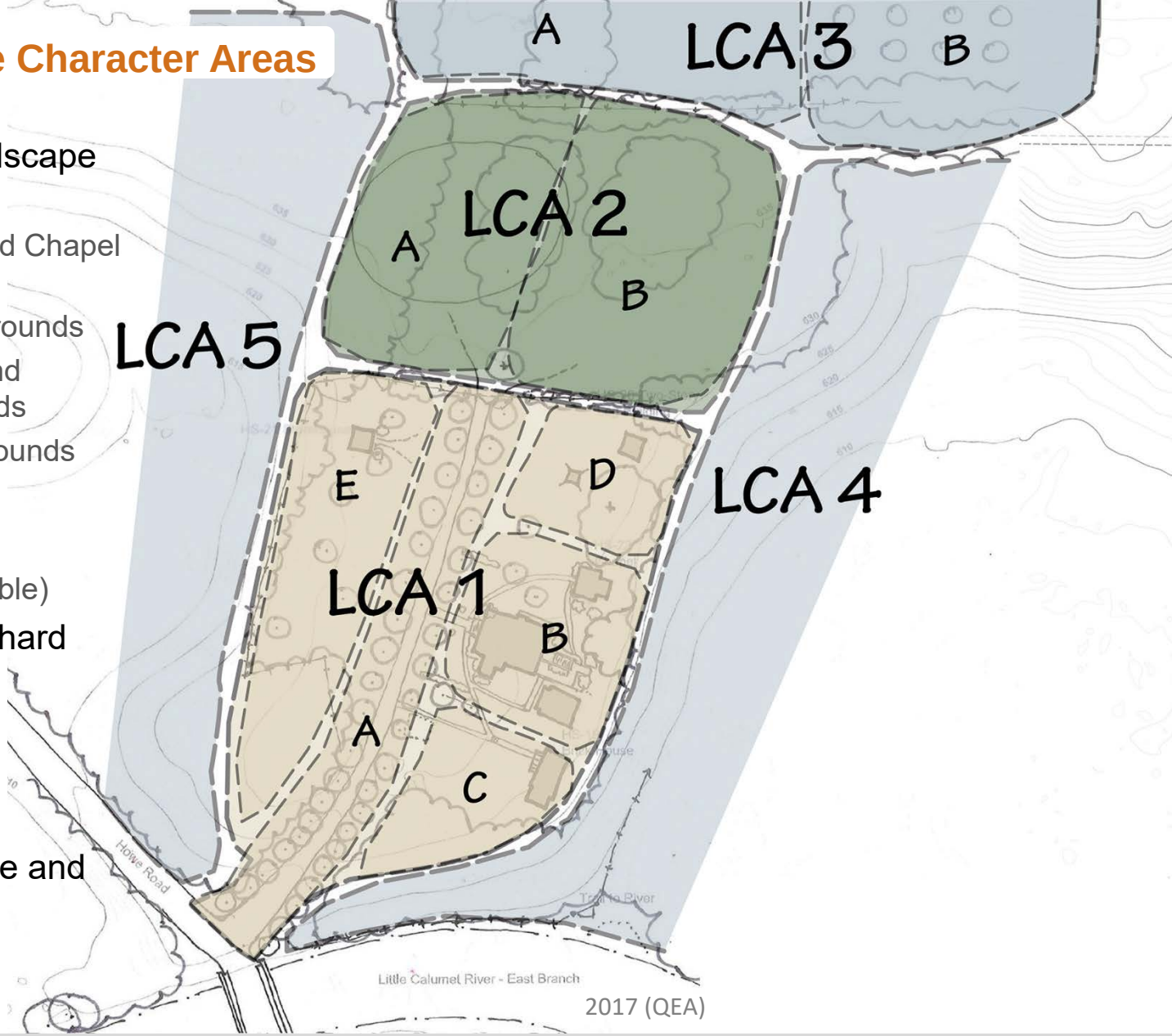
LCA 1: Domestic Landscape
- A. Entry Drive
- B. Main House and Chapel Grounds
- C. Brick House Grounds
- D. Log Building and Support Grounds
- E. Storehouse Grounds

LCA 2: Farm
- A. Barn Area
- B. Orchard (Possible)

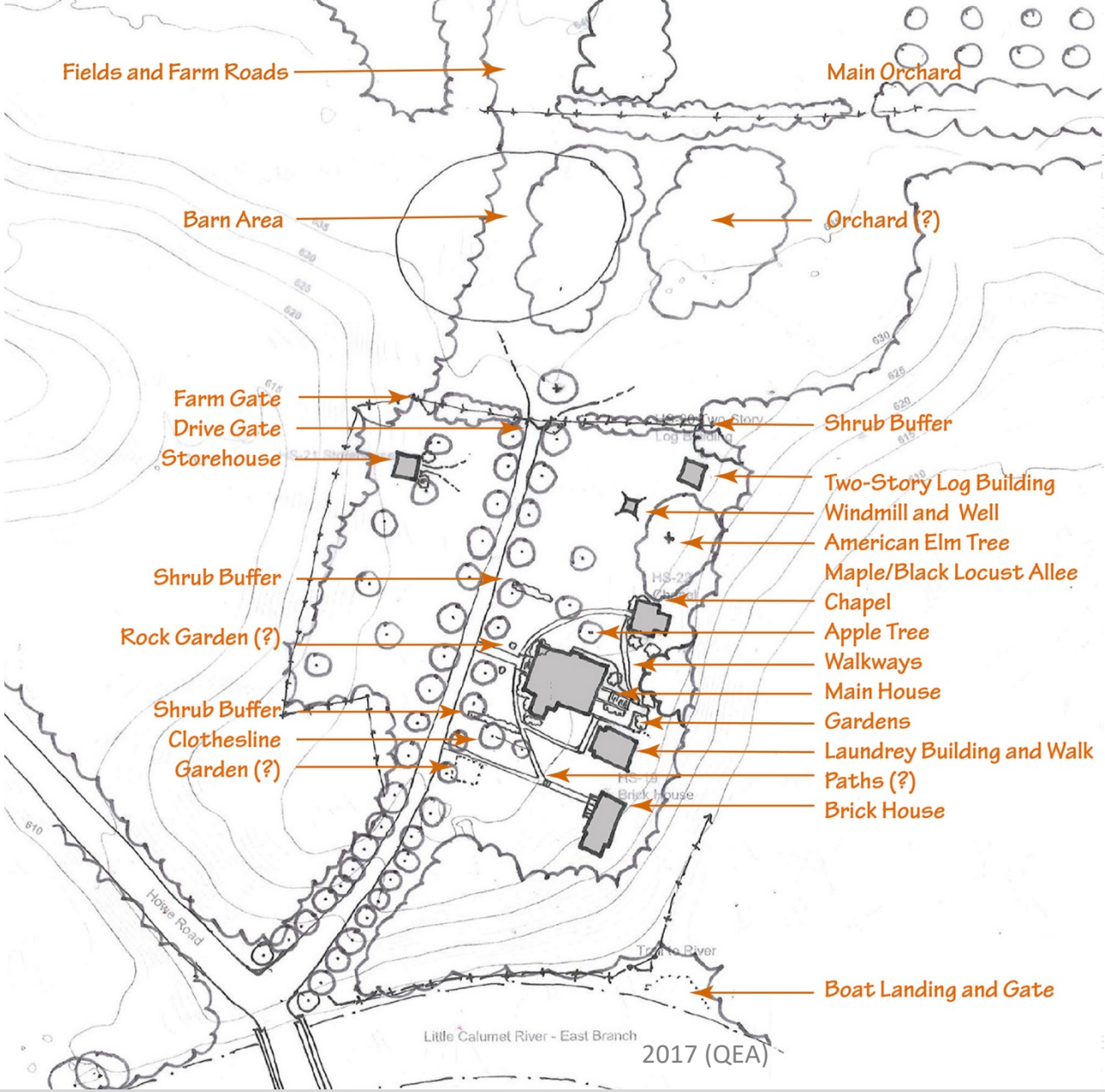
LCA 3: Fields and Orchard
- A. Fields
- B. Orchard

LCA 4: Riverbank and Meadow

LCA 5: Wooded Ravine and Uplands



1917 Historic Landscape



BAILLY HOMESTEAD CLR / HSR
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1917 Period Plan (draft)



1969 Aerial Photograph



BAILLY HOMESTEAD CLR / HSR
INDIANA DUNES NATIONAL LAKESHORE
Treatment Alternatives Workshop - August 28, 2017

2011 Aerial Photograph

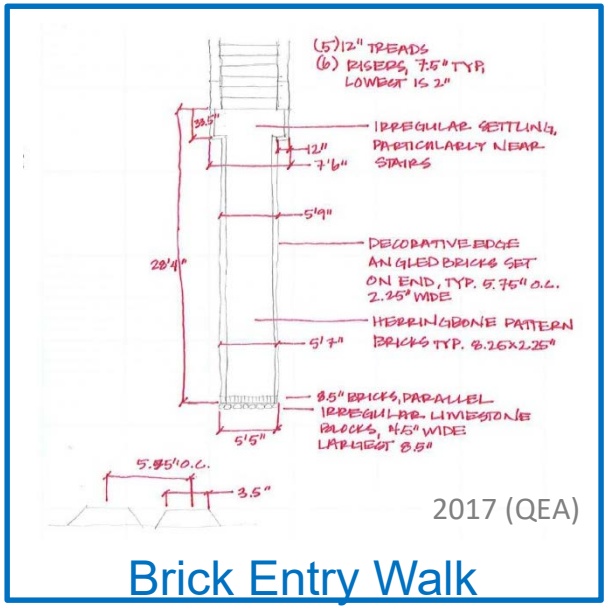
Landscape Character Defining Features

- Natural Systems and Features
- Topography
- Spatial Organization
- Circulation
- Vegetation
- Buildings and Structures
- Views and Vistas
- Small-scale Features


Olmsted Center for Landscape Preservation

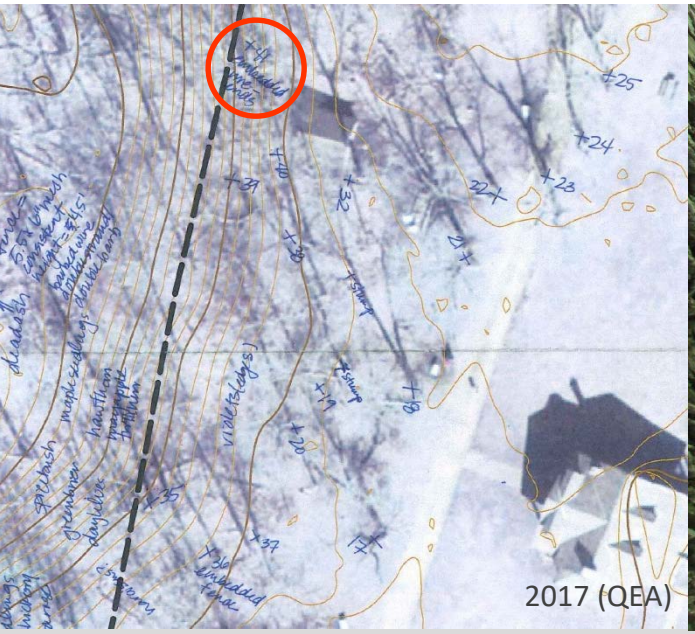
COMPREHENSIVE CONDITION ASSESSMENT REPORT – TREE

Tree 41

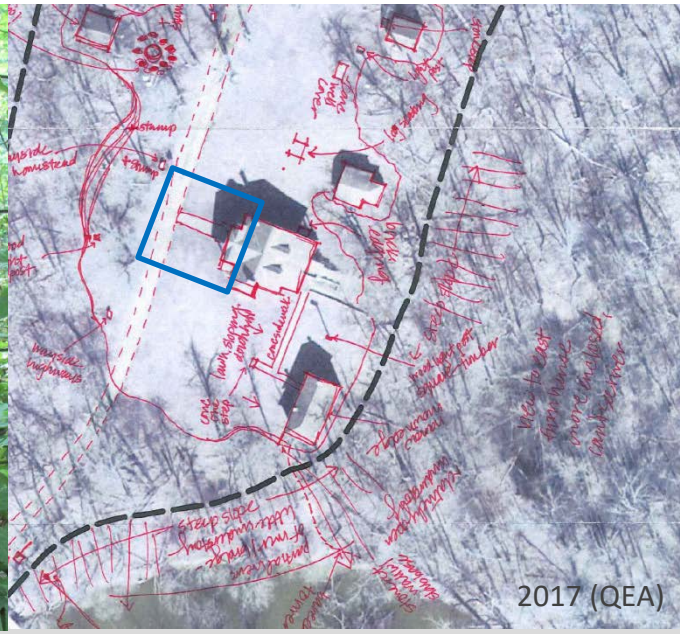


2017 (QEA)

Brick Entry Walk


2017 (QEA)


2017 (QEA)

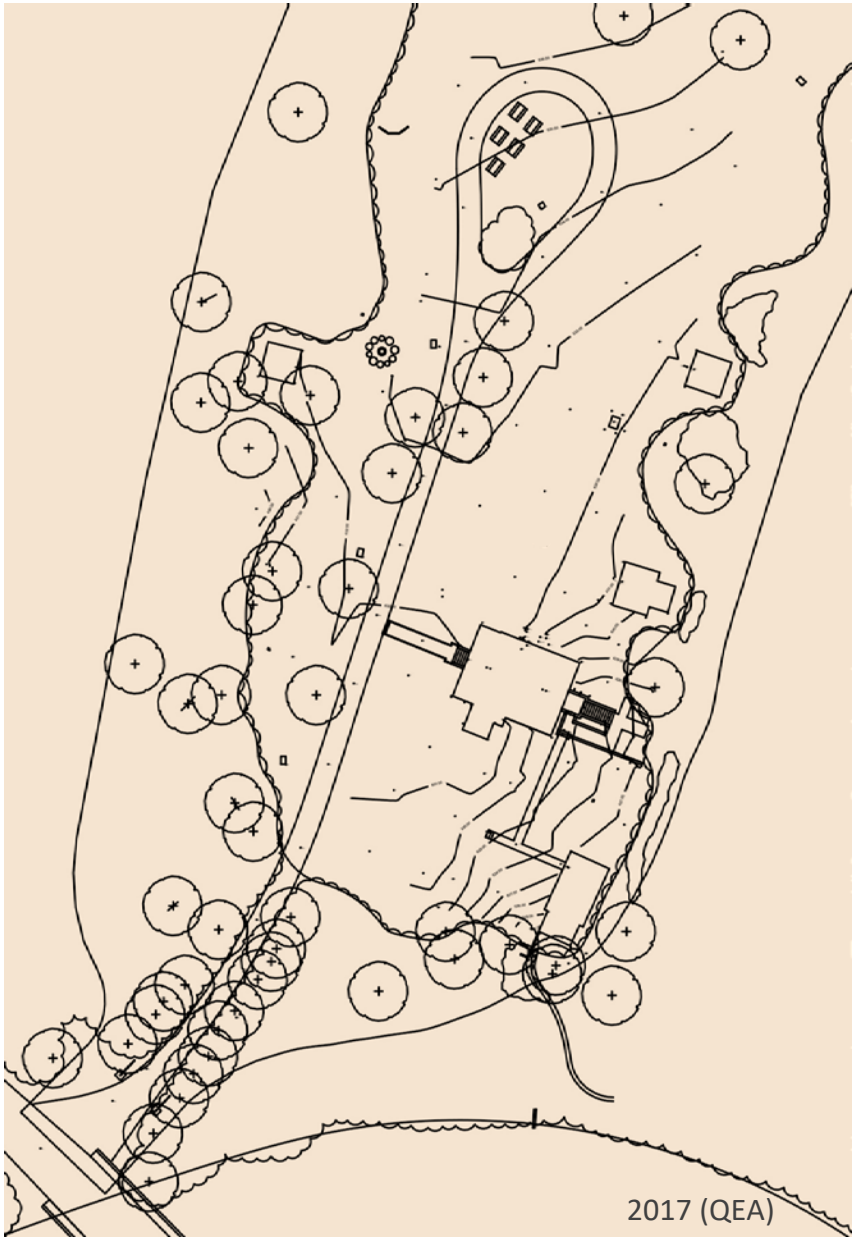

2017 (QEA)

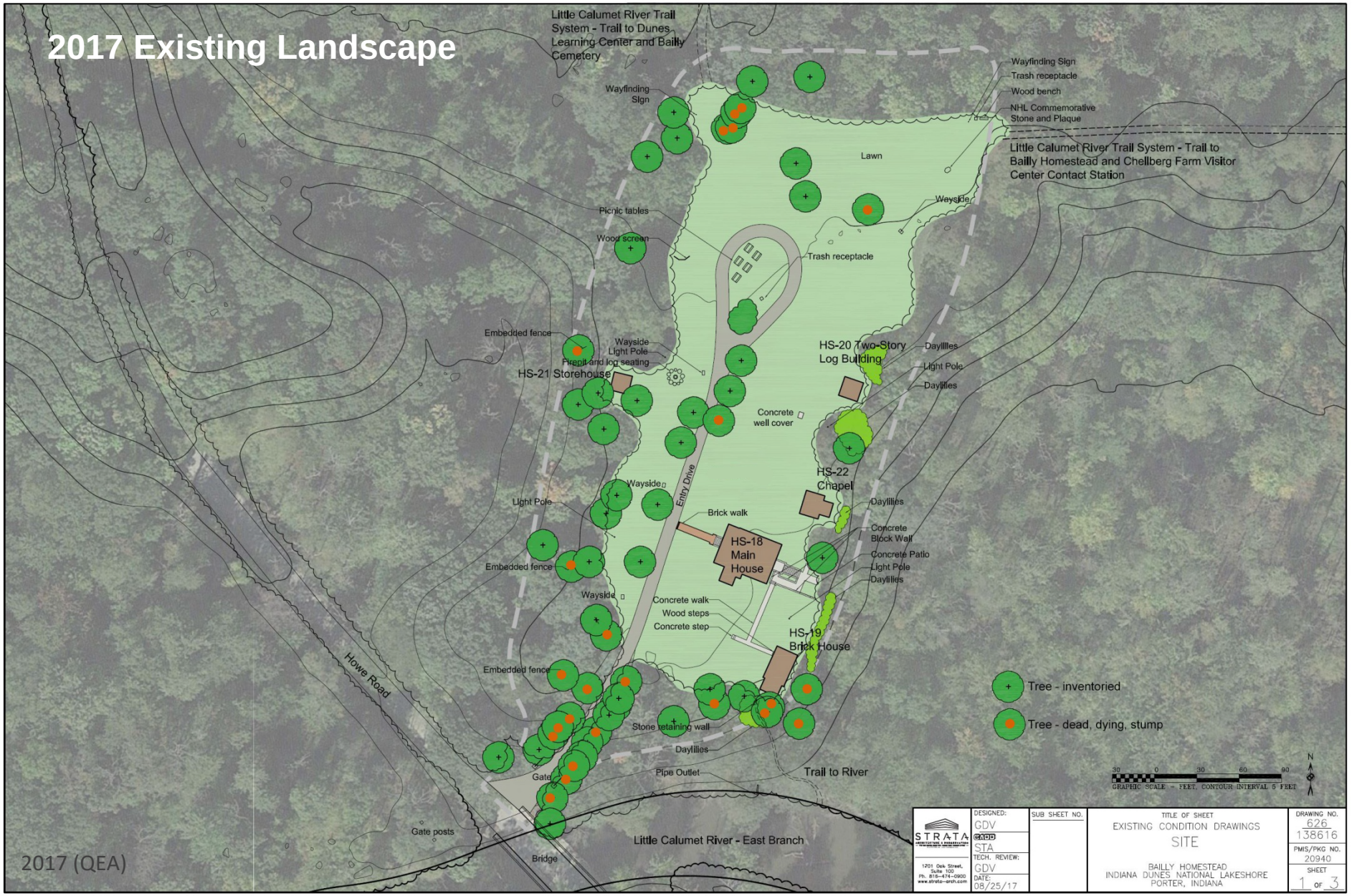
Focused Topographic Survey

- Assistance from Agustin Perez Maldonado, INDU Civil Engineer
- Targeted elevation data required for making accessibility recommendations

Information Collected:

- Building corners, thresholds, and first-floor elevations
- Ground surface at regular intervals between buildings and the driveway
- Top of east slope around the buildings
- Existing circulation features including drive, walks, and steps
- Retaining and site walls
- Light poles
- Free standing trees within the project site





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Landscape Existing Conditions

Historic Landscape Character is Impacted to Varying Degrees

- The extensive lack of extant landscape features leads to a diminished historic integrity

Analysis as Framework for Treatment

- Few non-contributing features impede future interpretation and use
- Intact aspects of integrity include location, setting, and key features like spatial organization and buildings
- Division of domestic areas (south) from farm operations (north) by 1917 presents options for interpretation

Sources that the target character for the 1908-1917 landscape:

- INDU archive photos ca.1890-1905
- INDU archive photos 1924, and 1926
- Oral histories for 1907-1911





Landscape Contributing Features
ca.1917 extant features

Natural Systems and Features
1. East Branch Little Calumet River

Topography
2. Homestead terrace with steep slopes 20’ above floodplain

Spatial Organization
3. Irregular alignment of buildings along a central drive

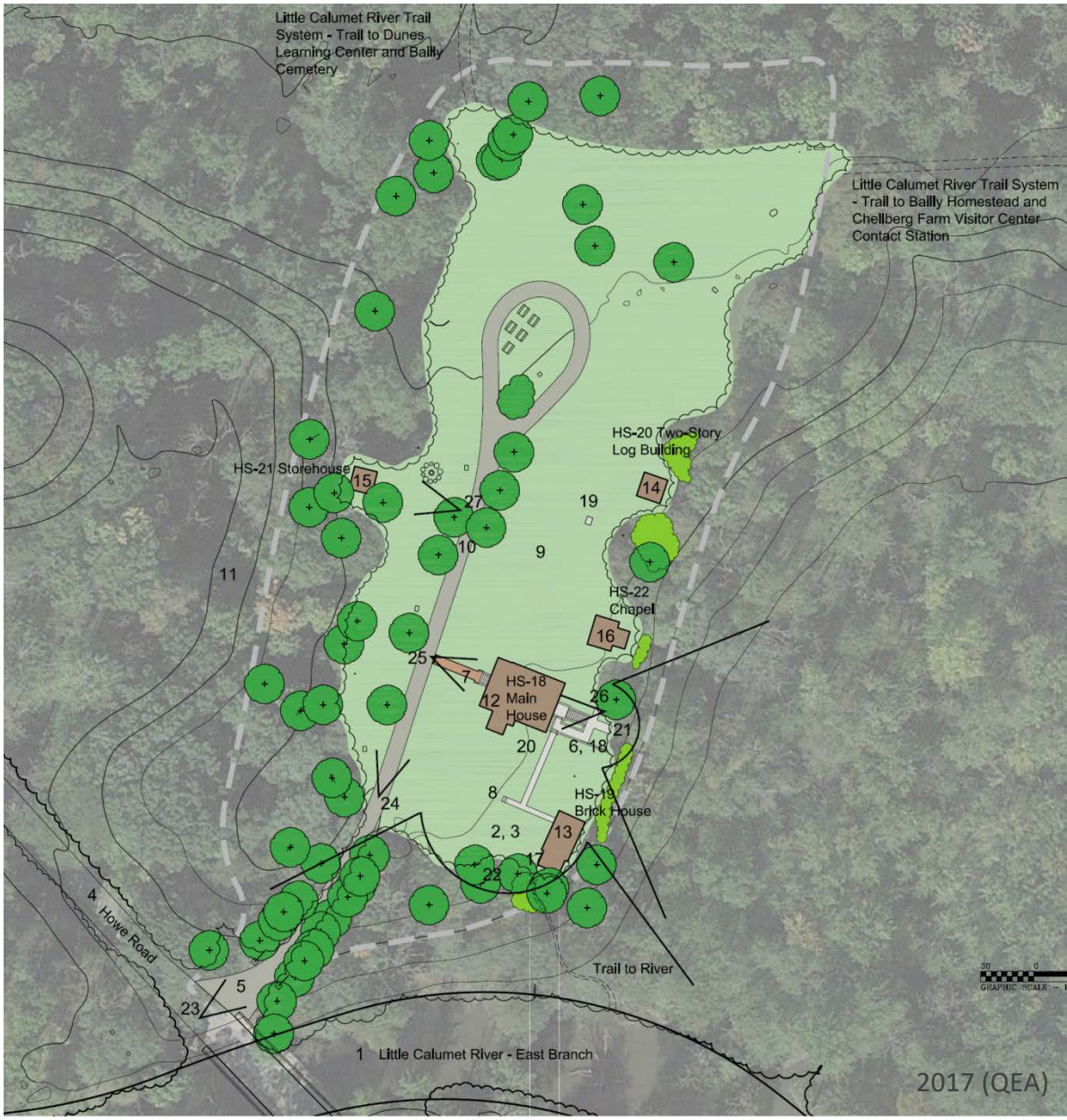
Circulation
4. Howe Road
5. Gravel drive
6. Concrete back patio
7. Brick sidewalk between Main House and drive
8. Masonry steps in lawn from Brick House (?)

Vegetation
9. Lawn grounds
10. Maple and black locust allée (remnant)
11. Wooded ravine to west

Buildings and Structures
12. HS-18 Main House
13. HS-19 Brick House (location post ca. 1904)
14. HS-20 2-story Log House (location post ca. 1904)
15. HS-21 Storehouse (probable location post ca. 1904)
16. HS-22 Chapel (location post ca. 1904)
17. Fieldstone retaining wall at brick house (?)
18. Concrete block retaining walls at Main House patio
19. Remnant well and windmill location northwest of Main House
20. Remnant cistern location south of Main House

Views and Vistas
21. Screened views from elevated Homestead complex from bridge and road south of river
22. View of entry drive and allée from Howe Road
23. View along drive and allée through site
24. View of Main House from drive
25. View to Main House from back patio
26. View to Storehouse from drive
27. View across lowland and river (seasonal) from Main House and northeast patio

Small-scale Features
28. Remnant fence lines along edge of ravine



Landscape Contributing Features – 28 ca.1917 remaining features

Natural Systems and Features
1. Little Calumet River – East Branch

Topography
2. Homestead terrace with steep slopes 20’ above floodplain

Spatial Organization
3. Irregular alignment of buildings along a central drive

Circulation
4. Howe Road
5. Gravel drive
6. Concrete back patio
7. Brick sidewalk between Main House and drive
8. Masonry steps in lawn from Brick House (?)

Vegetation
9. Lawn grounds
10. Drive allée (remnant maple and black locust)
11. Wooded ravine to west

(Individual plants undetermined: daylily, multiflora rose, mulberry, willow oak, black locust, maple, etc.)

Landscape Contributing Features – 28 ca.1917 extant features

Buildings and Structures

12. HS-18 Main House
13. HS-19 Brick House (location post ca. 1904)
14. HS-20 2-story Log House (location post ca. 1904)
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Views and Vistas

21. Screened views between Homestead complex and bridge and road south of river
22. Screened views between Main House and patio and lowland and river
23. View of entry drive and allée from Howe Road
24. View along drive and allée through site
25. View of Main House from drive
26. View to Main House from back patio
27. View to Storehouse from drive

Small-scale Features

28. Remnant fence lines along edge of ravine



2017 (STRATA)



2017 (STRATA)



2017 (STRATA)



1 A2 EXISTING WEST ELEVATION
1/4" = 1'-0"



1 A2 EXISTING EAST ELEVATION
1/4" = 1'-0"

HS-18 Main House



2017 (STRATA)



2017 (STRATA)



2017 (STRATA)



1/A2 EXISTING SOUTH ELEVATION
1/4" = 1'-0"

HS-18 Main House



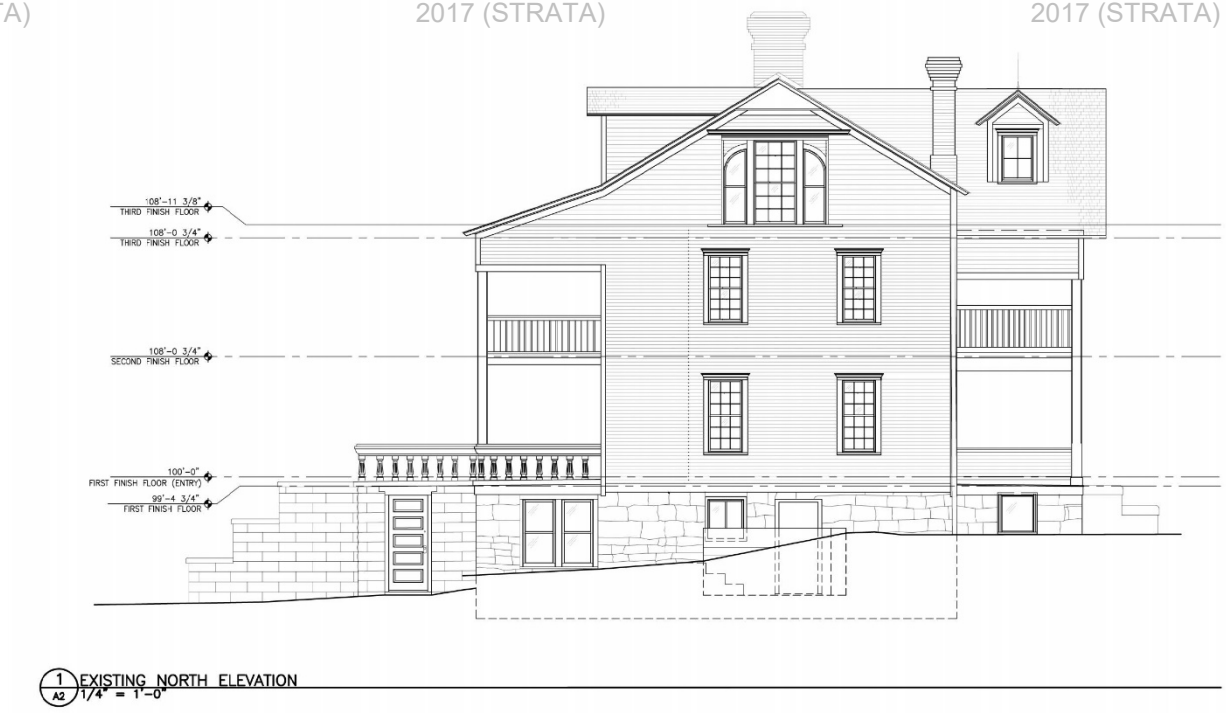
2017 (STRATA)



2017 (STRATA)



2017 (STRATA)



HS-18 Main House



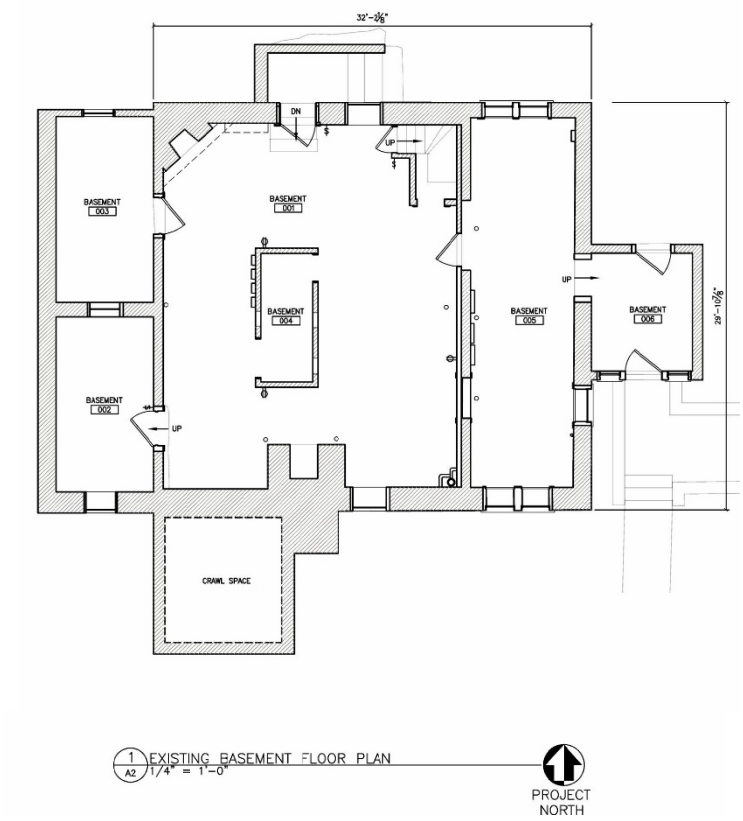
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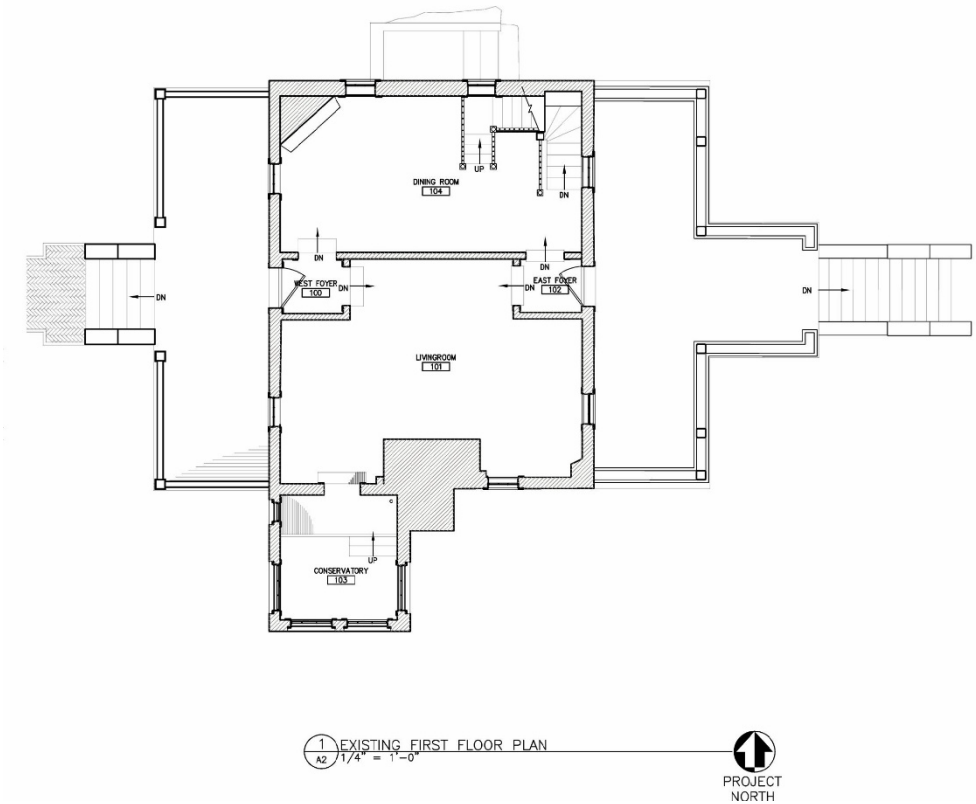


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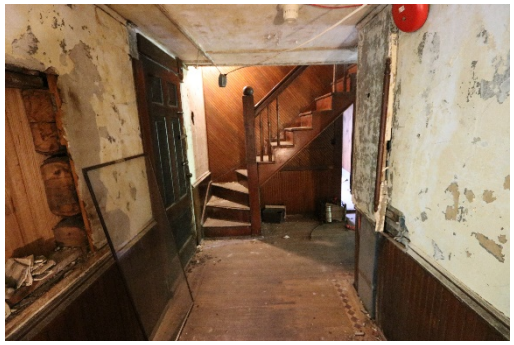




HS-18 Main House



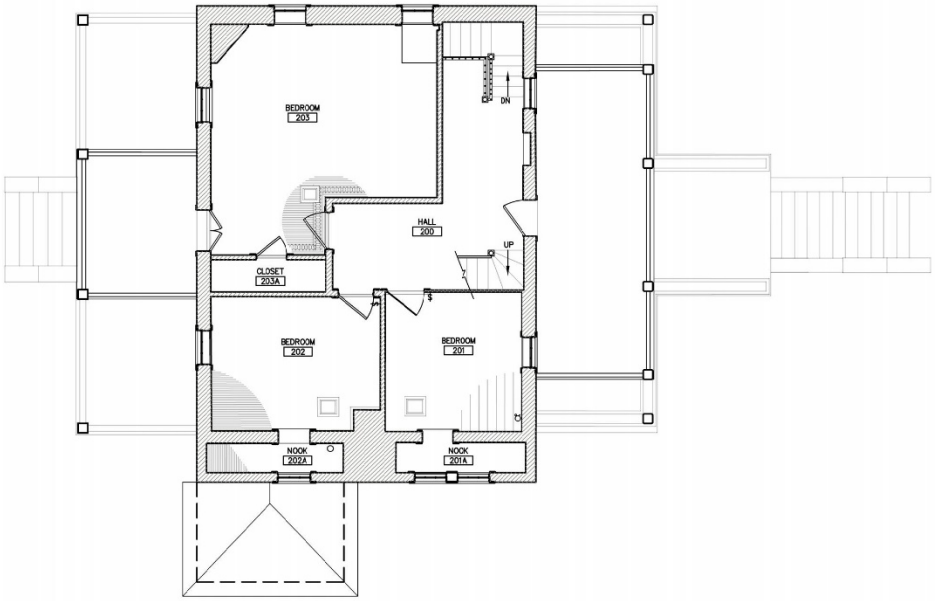
2017 (STRATA)



2017 (STRATA)

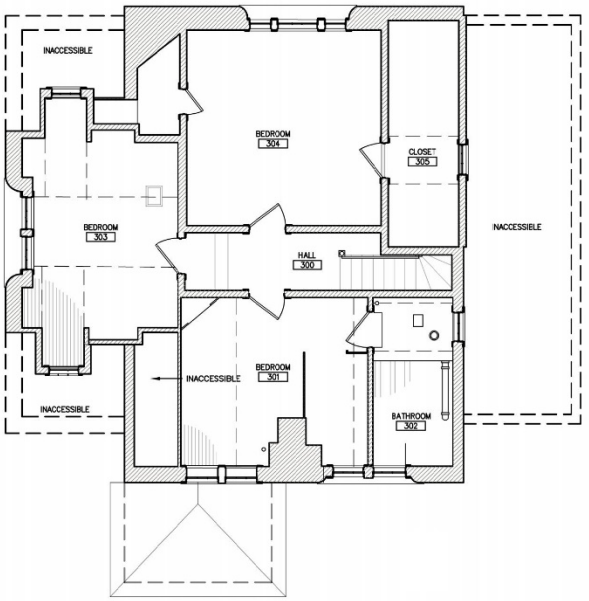


2017 (STRATA)



1 A2 EXISTING SECOND FLOOR PLAN
1/4" = 1'-0"

PROJECT NORTH



1 A2 EXISTING THIRD FLOOR PLAN
1/4" = 1'-0"

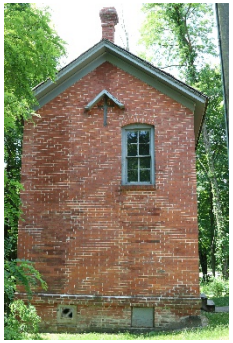
PROJECT NORTH



2017 (STRATA)



2017 (STRATA)

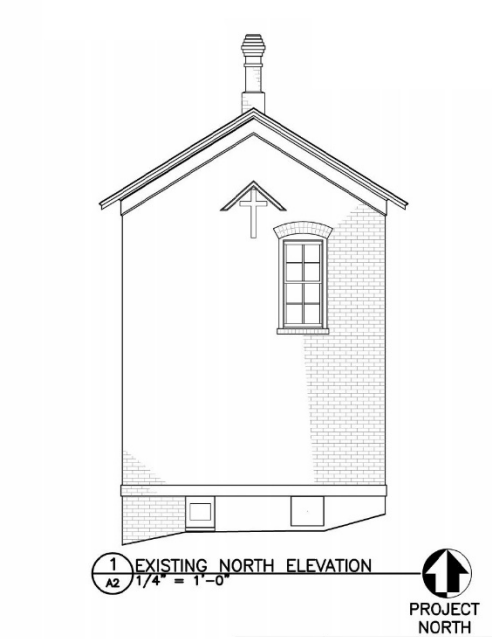


2017 (STRATA)



2017 (STRATA)





HS-19 Brick House



2017 (STRATA)



2017 (STRATA)



2017 (STRATA)





HS-19 Brick House



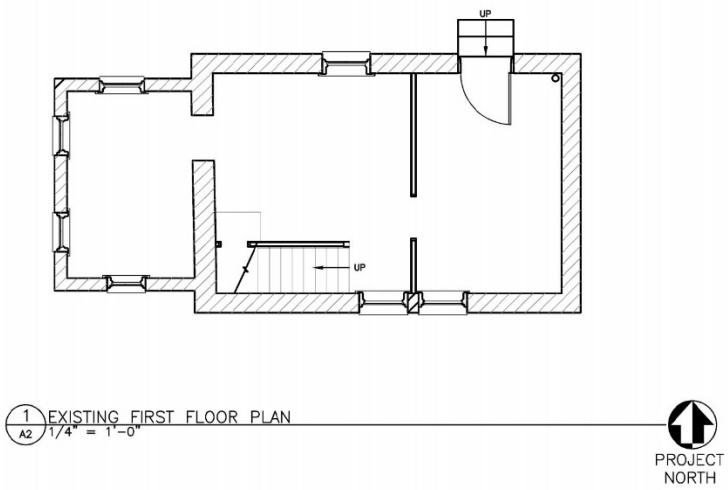
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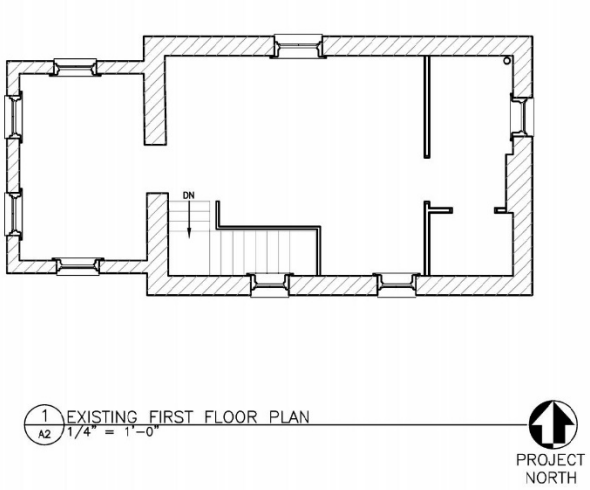


2017 (STRATA)



2017 (STRATA)







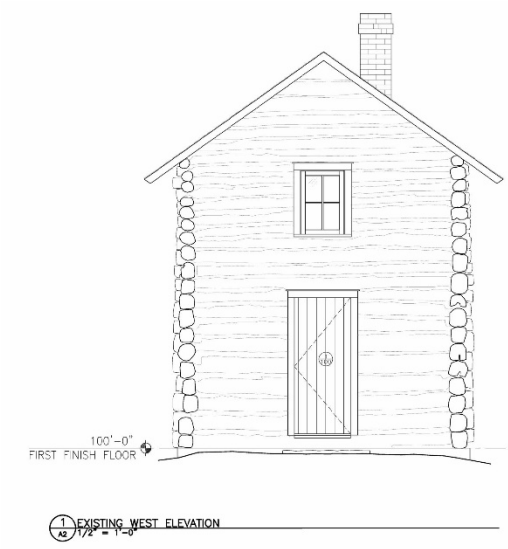
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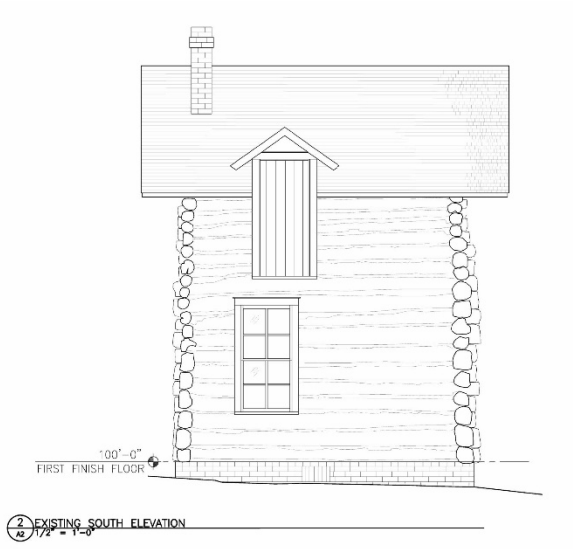


2017 (STRATA)



2017 (STRATA)





HS-20 2-Story Log House



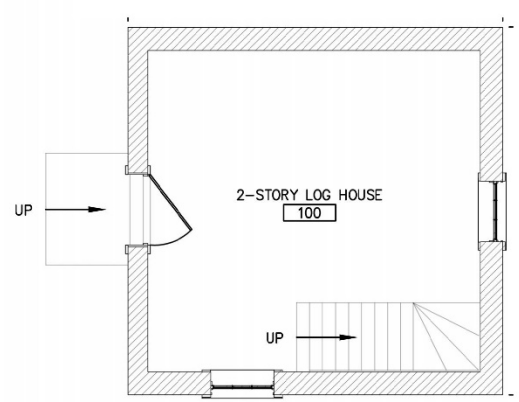
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2017 (STRATA)

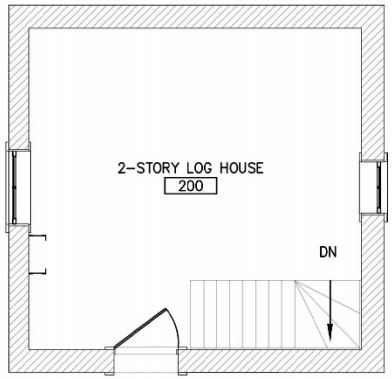


2017 (STRATA)



1 A2 EXISTING FIRST FLOOR PLAN
1/2" = 1'-0"

PROJECT NORTH



2 A2 EXISTING SECOND FLOOR PLAN
1/2" = 1'-0"

PROJECT NORTH

HS-20 2-Story Log House



2017 (STRATA)

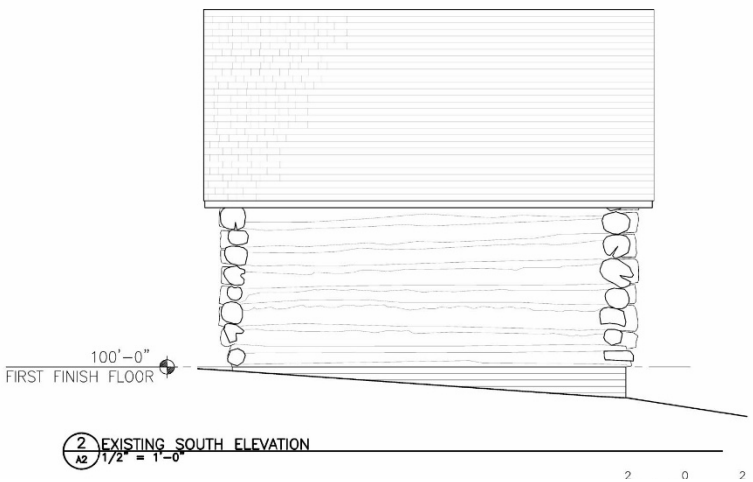


2017 (STRATA)



2017 (STRATA)





HS-21 Storehouse



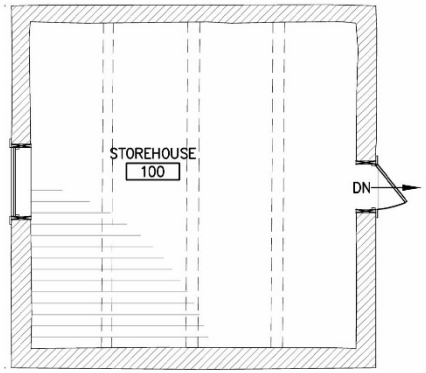
2017 (STRATA)



2017 (STRATA)



2017 (STRATA)



1 A2 EXISTING FIRST FLOOR PLAN
1/2" = 1'-0"

PROJECT NORTH

HS-21 Storehouse



2017 (STRATA)

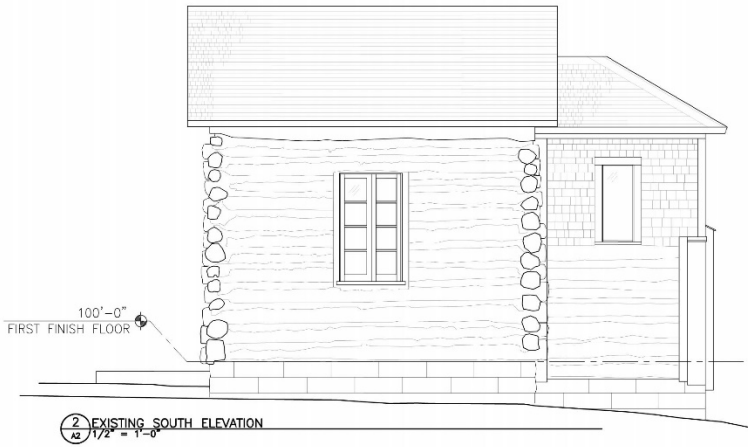


2017 (STRATA)



2017 (STRATA)







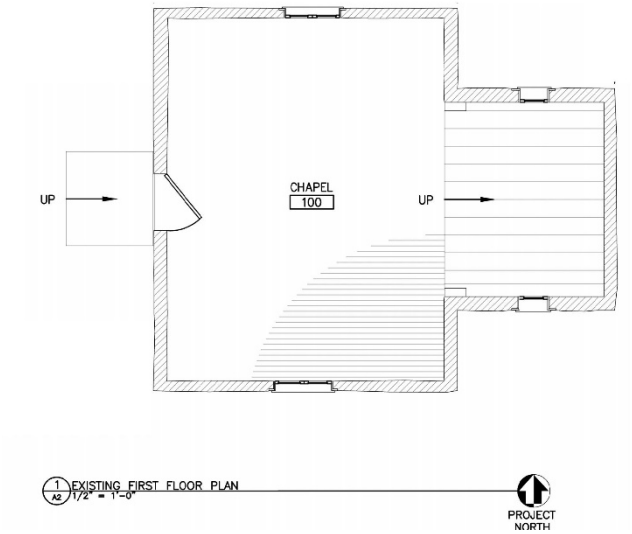
2017 (STRATA)



2017 (STRATA)



2017 (STRATA)



HS-22 Chapel


2017 (STRATA)


1970's (INDU)


1970's (INDU)


1977 (INDU)

Second Floor Framing



2017 (STRATA)



2017 (STRATA)

Stair Framing



2017 (STRATA)



2017 (STRATA)

Moisture Damage



2017 (SEA)



1976 (INDU)

Third Level Framing



2017 (SEA)



2017 (SEA)

Monitoring Movement



2017 (SEA)



2017 (STRATA)

Roof Framing



2017 (SEA)



2017 (SEA)

Roof Framing



2017 (SEA)



2017 (SEA)

Brick House



2017 (SEA)



2017 (SEA)

Two-Story Log Building



2017 (SEA)



2017 (SEA)

Storehouse and Chapel



2017 (SEA)



2017 (SEA)


1924 (INDU)

TREATMENT ALTERNATIVE WORKSHOP GOALS:

Discussion will center on rehabilitation issues for the Site, Main House and Outbuildings including impacts on:

- *Historic Integrity*
- *Site Planning*
- *Site Accessibility*
- *Building Accessibility*
- *Building Interior Layout*
- *MEP Systems*
- *Utilities*

Determine a preferred use for the site and buildings and a final treatment for further exploration.

SECRETARY OF THE INTERIOR'S FOUR TREATMENT STANDARDS

PRESERVATION: the act of process of applying measures necessary to sustain the existing form, integrity, and materials of an history property.

REHABILITATION: act of 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: act of 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. 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.

RECONSTRUCTION: act of 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.

SELECTING A TREATMENT

LEVEL OF SIGNIFICANCE – Bailly Homestead National Historic Landmark – designated for "exceptional significance in American history" and properties important for their interpretive value may be candidates for Preservation or Restoration. However, Rehabilitation most commonly used treatment for the majority of historic buildings

PHYSICAL CONDITION – Preservation appropriate if distinctive materials, features, and spaces are essentially intact and convey the building's historical significance. If the building requires more extensive repair and replacement…then Rehabilitation is probably the most appropriate treatment.

PROPOSED USE – Some historic buildings can be adapted to a new use or updating for a continued use without seriously impacting their historic character. Other buildings require major alterations, resulting in loss of historic character and even integrity.

CODE AND OTHER REGULATIONS – Regardless of the treatment, regulatory requirements must be addressed. Sensitive design approaches are important to protect historic materials and character.

SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION

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

INDIANA DUNES NATIONAL LAKESHORE
MISSION STATEMENT

"to preserve for the educational, inspirational, and recreational use of the public certain portions of the Indiana Dunes and other areas of scenic, scientific, and historic interest and recreational value in the State of Indiana."



Indiana Dunes National Lakeshore



(NPS)

BAILLY HOMESTEAD, NATIONAL LAKESHORE, AND REGIONAL AMENITIES

Regional/National Lakeshore:

Paddling
Hiking
Swimming / Beach
Dunes
Biking
History
Education

Bailly:

Education
Candlelight Tours
History
Weddings
Family Reunions


1926 ca. (INDU)

BRAINSTORMING – USE AND TREATMENT OPTIONS

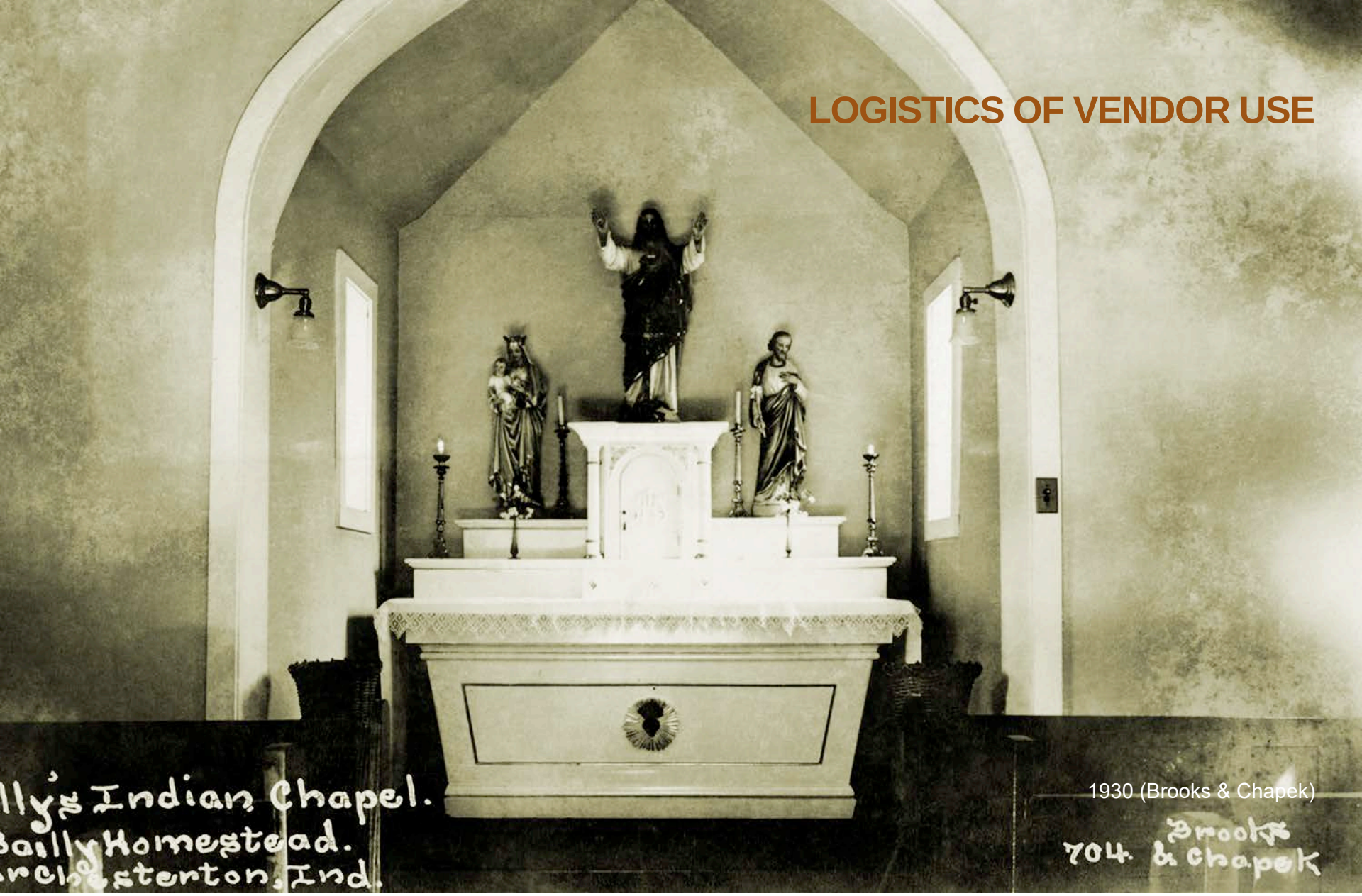
POTENTIAL USES

Bed and Breakfast
House Museum
VRBO
Restaurant / Cafe / Trail Vending
Outdoor Weddings or very small weddings in main house front parlor or chapel
Educational Facility
Library / Research Center
Administrative / Offices (NPS or Private Vendor Use)
Residential / Rental



1950 (Brooks & Chapek)

LOGISTICS OF VENDOR USE

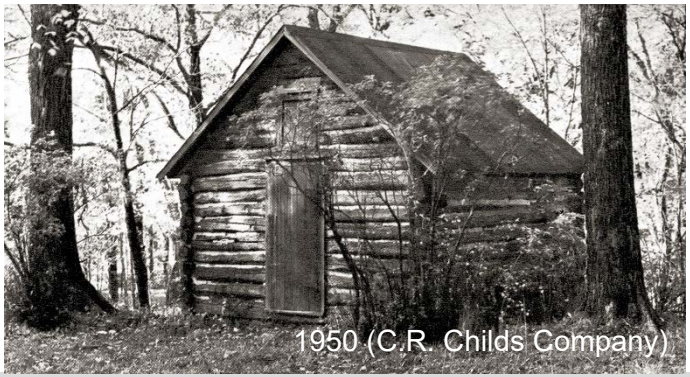


LOGISTICS OF VENDOR USE

SITE AND BUILDING LIMITATIONS

Dependent Upon Use
Historic Rehabilitation Limitations Due to Landmark Status
Small Buildings – No Large Event Space
Accessibility
- Site and Individual Buildings – Grade Changes and Multiple Levels
Building Code Updates / Fire Egress Requirements
Public Access / Trail
Limited Services
Limited On-site Parking
Difficult Site Access for Delivery/Trash Services


1908 (Arthur E. Nickel)

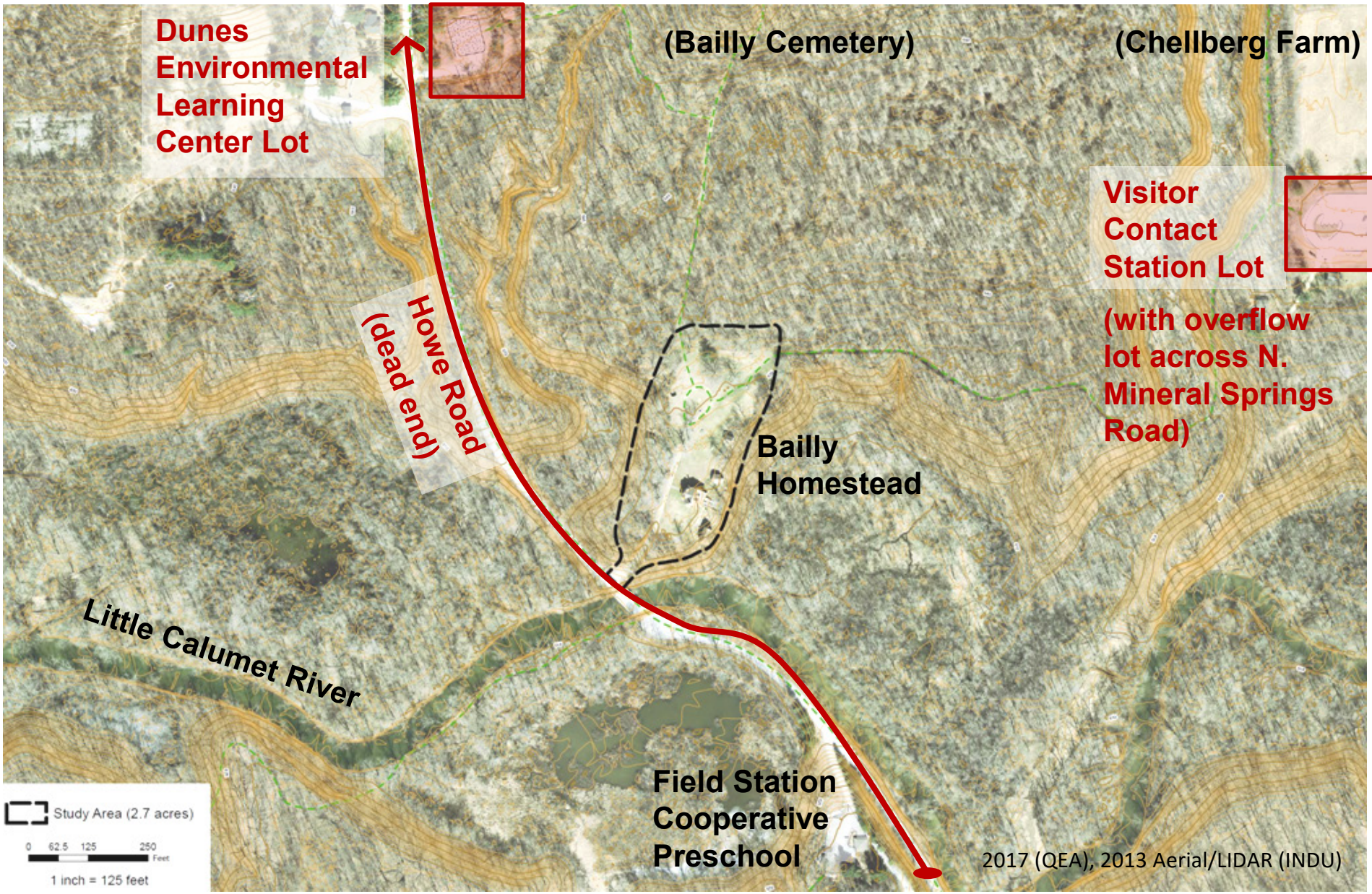

1950 (C.R. Childs Company)


1924 (INDU)



BAILLY HOMESTEAD CLR / HSR
INDIANA DUNES NATIONAL LAKESHORE
Treatment Alternatives Workshop - August 28, 2017

Pedestrian and Riverine Connections



BAILLY HOMESTEAD CLR / HSR
INDIANA DUNES NATIONAL LAKESHORE
Treatment Alternatives Workshop - August 28, 2017

Vehicular Connections

Overflow

Dunes Environmental Learning Center Lot
= approx. 18 spaces, 0.3mi.

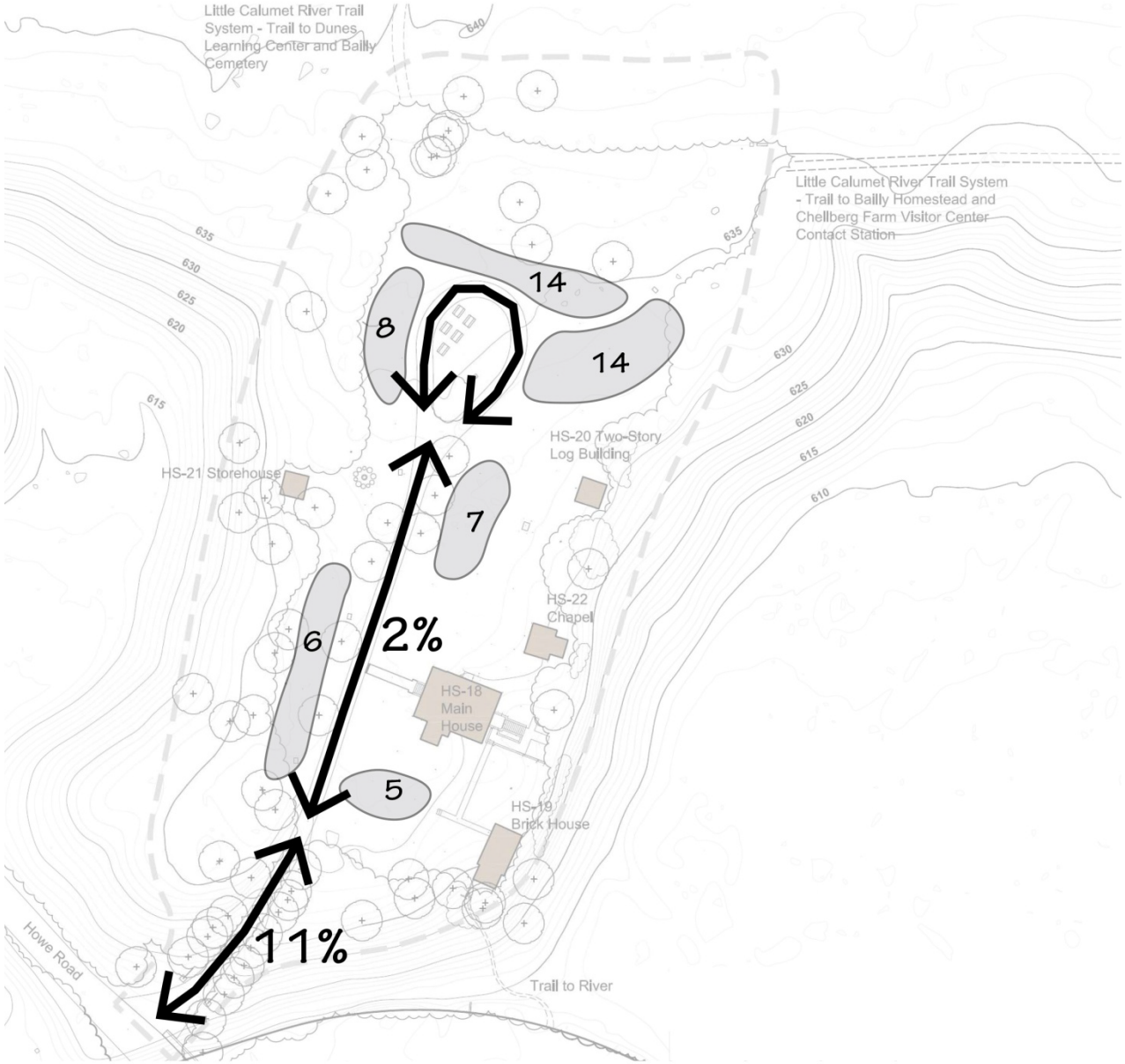


Bailly Homestead

Visitor Contact Station Lot
= 31 spaces, 2 ADA, 2 buses, 0.4mi.
Overflow = approx. 300 spaces

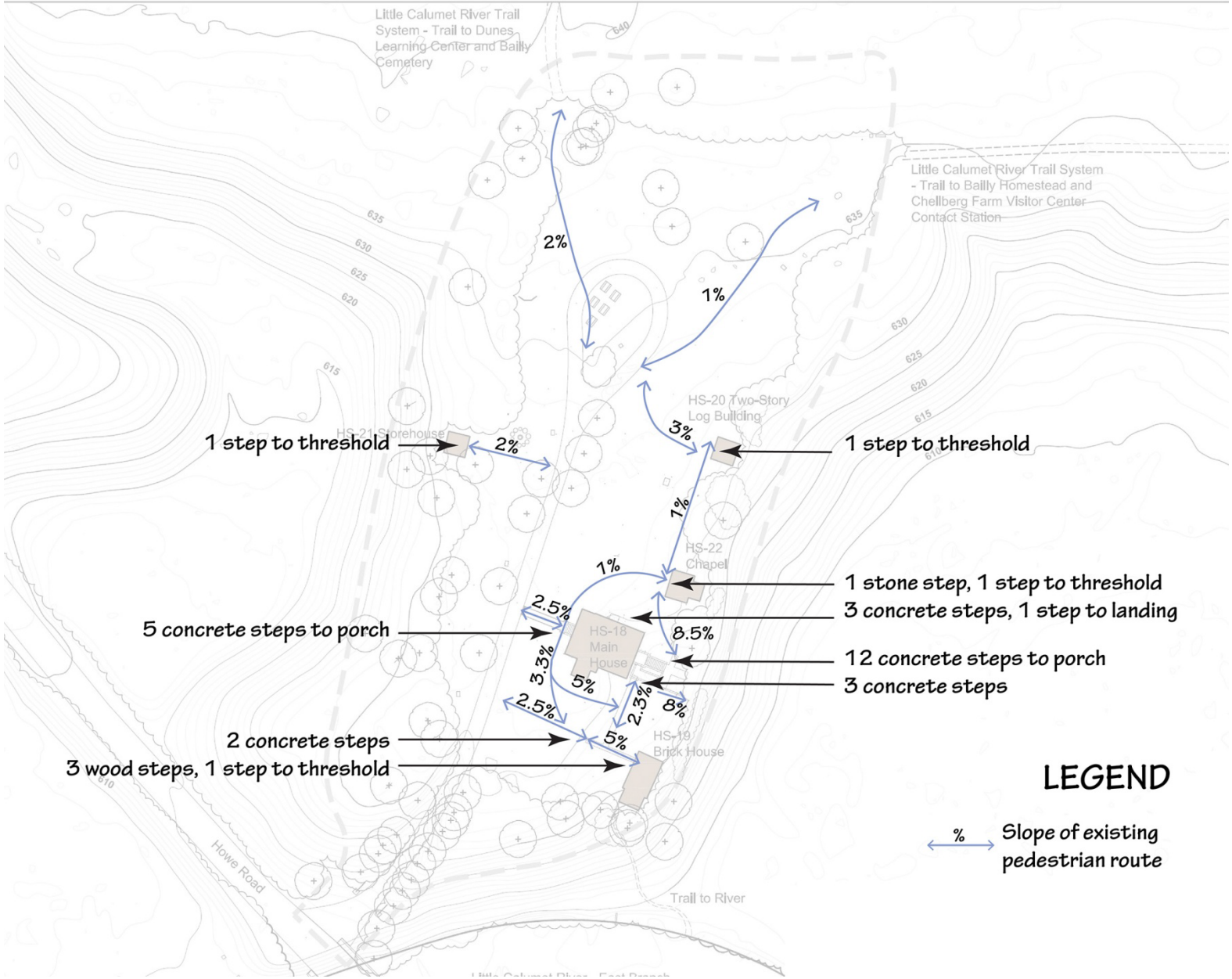


Vehicular Connections



2017 (QEA)

Existing Vehicular Circulation and Potential Capacity



2017 (QEA)

Existing Pedestrian Circulation

Afternoon

Use and Treatment Options

Landscape Contributing Features
ca.1917 extant features

Natural Systems and Features
1. East Branch Little Calumet River

Topography
2. Homestead terrace with steep slopes 20' above floodplain

Spatial Organization
3. Irregular alignment of buildings along a central drive

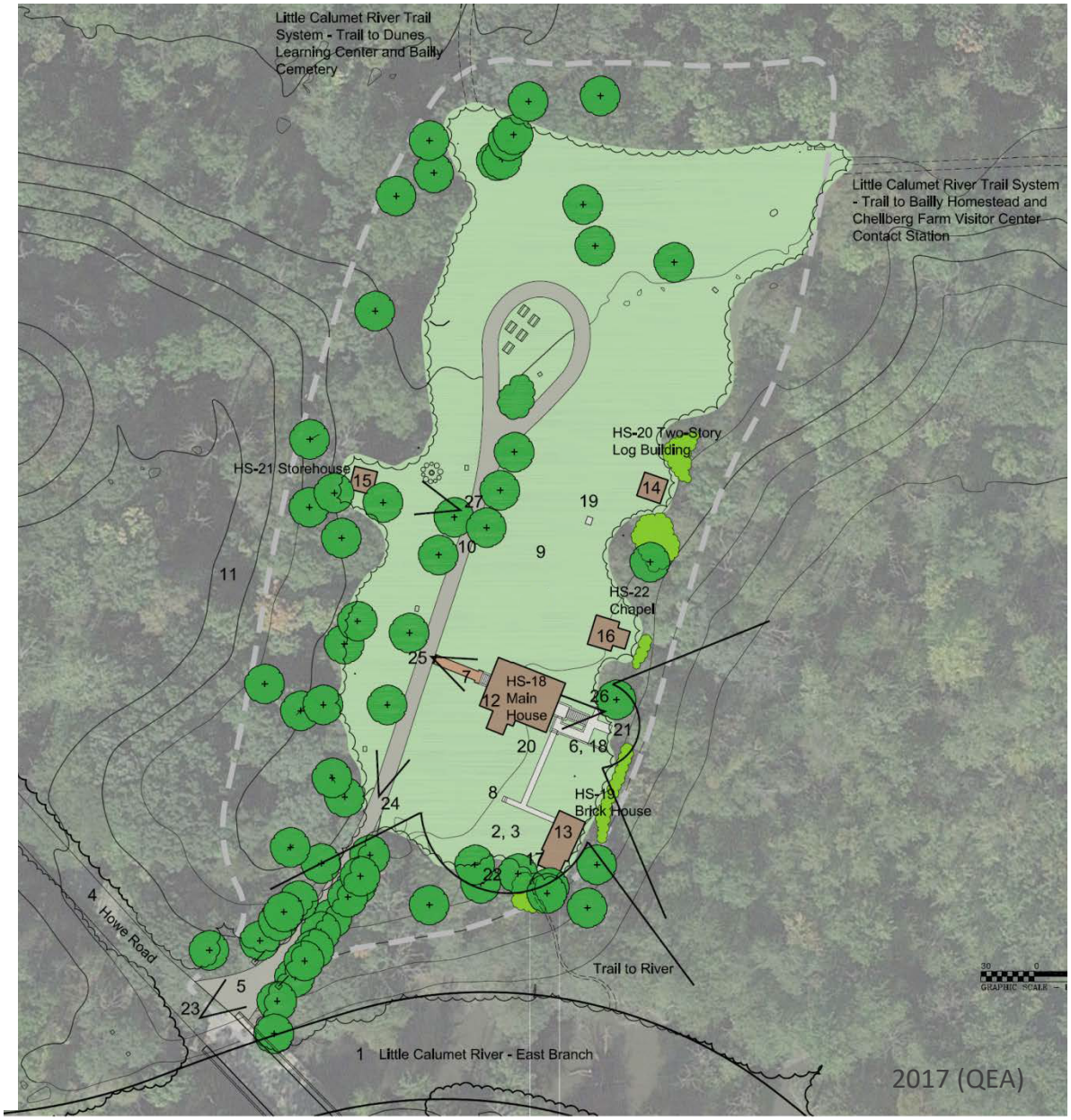
Circulation
4. Howe Road
5. Gravel drive
6. Concrete back patio
7. Brick sidewalk between Main House and drive
8. Masonry steps in lawn from brick house (?)

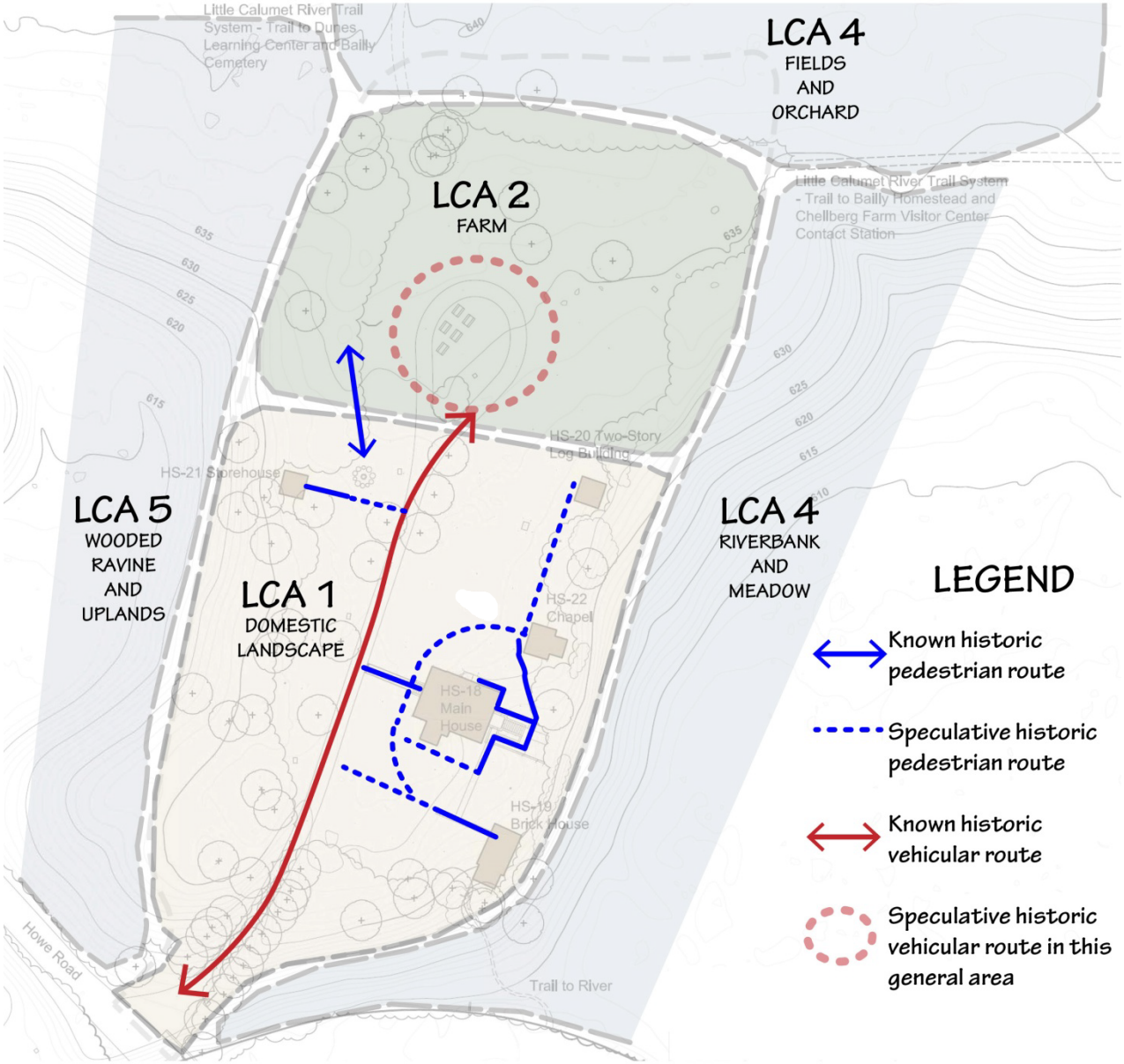
Vegetation
9. Mown lawn grounds
10. Maple and black locust allée (remnant)
11. Wooded ravine to west

Buildings and Structures
12. HS-18 Main House
13. HS-19 Brick House (location post ca. 1904)
14. HS-20 2-story Log House (location post ca. 1904)
15. HS-21 Storehouse (probable location post ca. 1904)
16. HS-22 Chapel (location post ca. 1904)
17. Fieldstone retaining wall at brick house (?)
18. Concrete block retaining walls at Main House patio
19. Remnant well and windmill location northwest of Bailly House
20. Remnant cistern location south of Bailly House

Views and Vistas
21. Screened views from elevated Homestead complex from bridge and road south of river
22. View of entry drive and allée from Howe Road
23. View along drive and allée through site
24. View of Main House from drive
25. View to Main House from back patio
26. View to Storehouse from drive
27. View across lowland and river (seasonal) from Main House and northeast patio

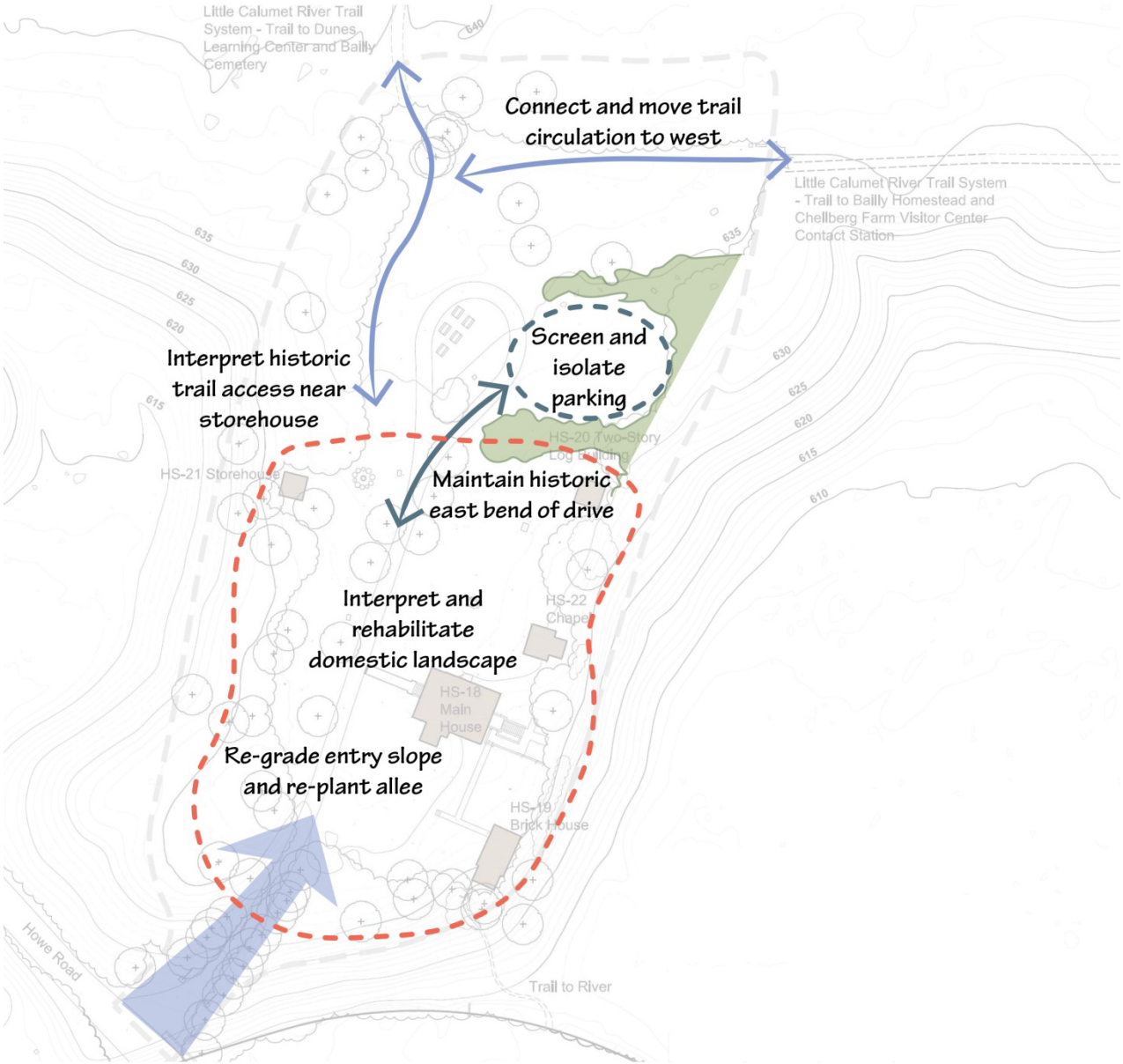
Small-scale Features
28. Remnant fence lines along edge of ravine





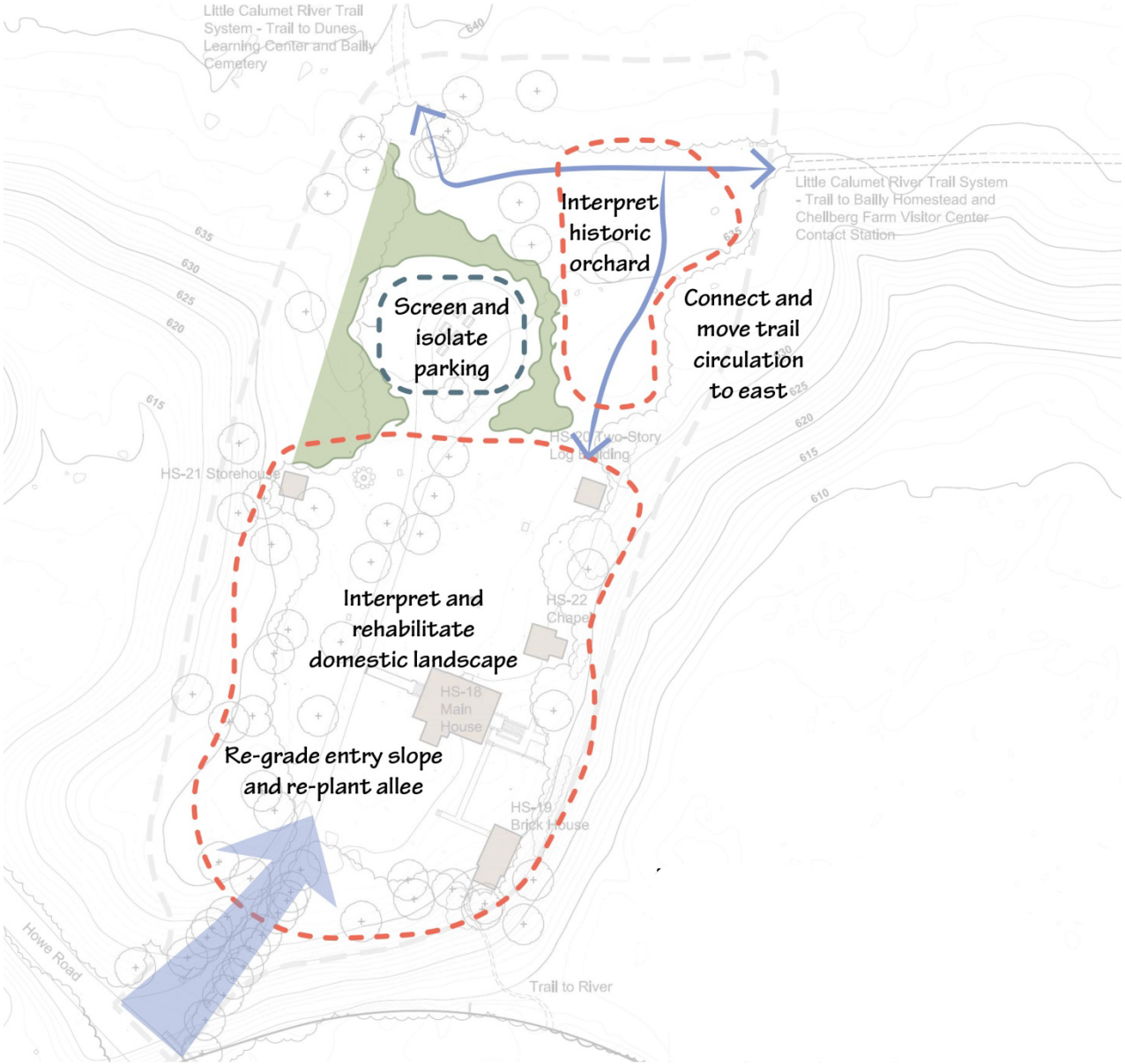
2017 (QEA)

Historic Circulation



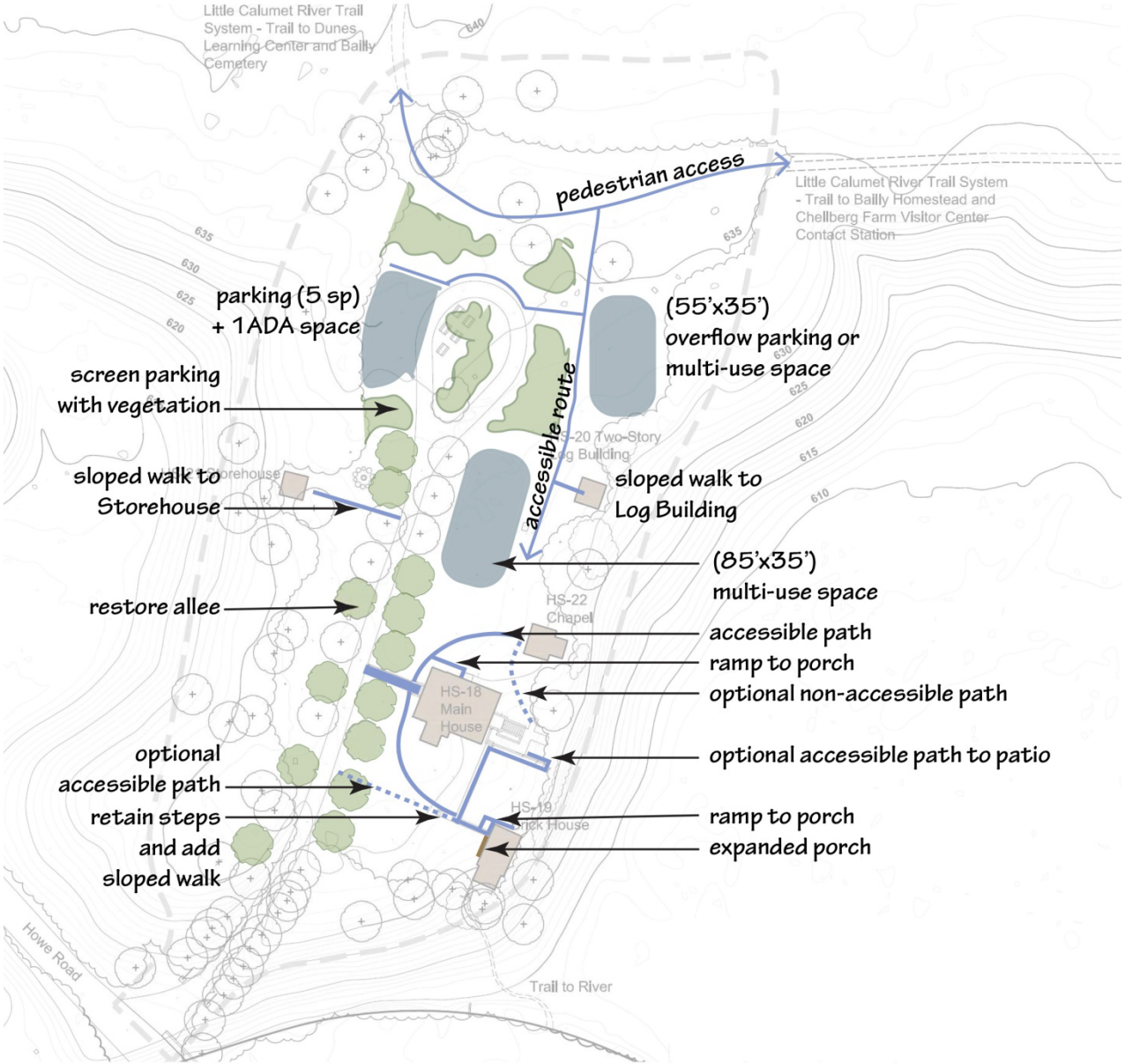
2017 (QEA)

Potential Use Concept A



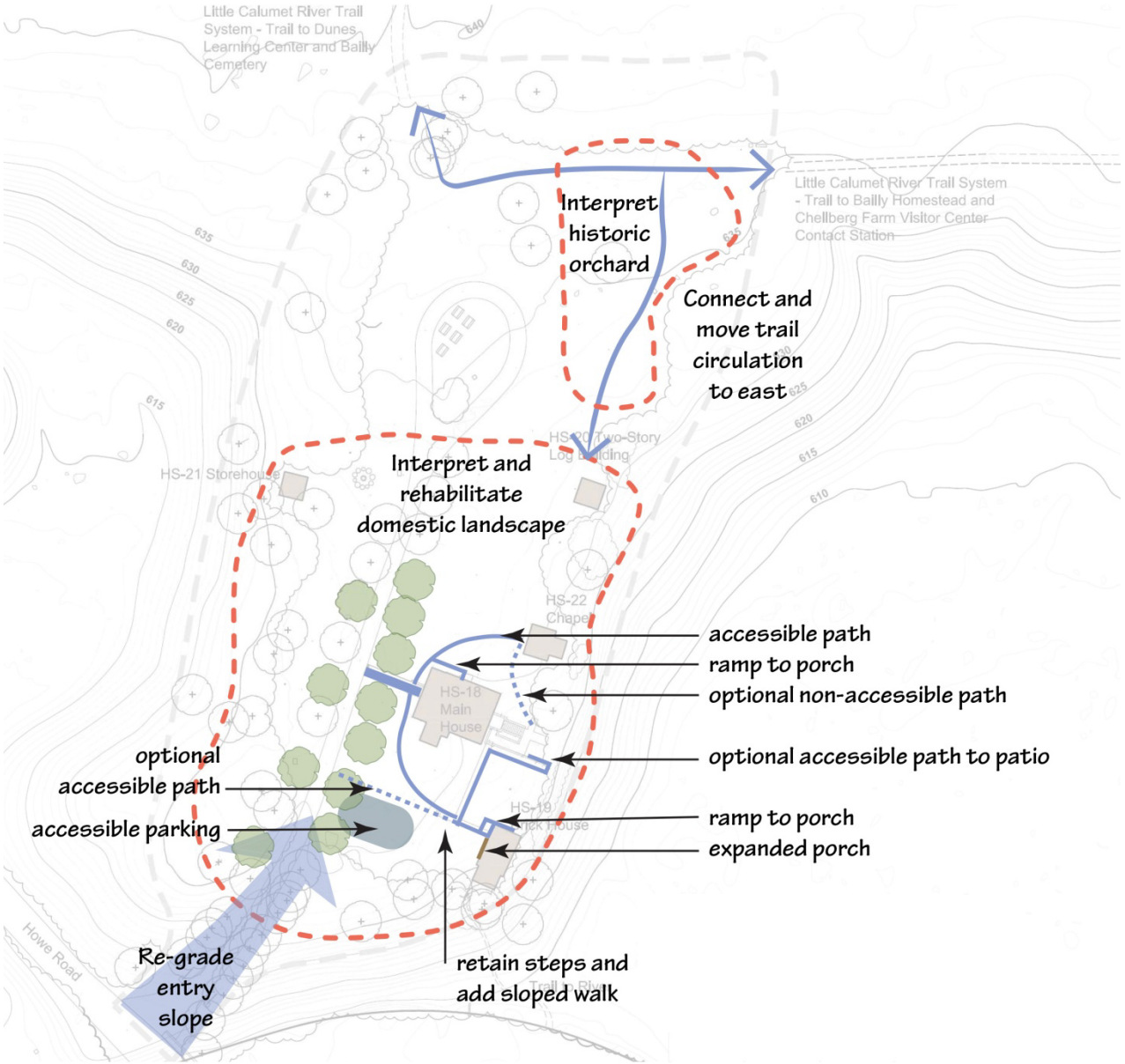
2017 (QEA)

Potential Use Concept B



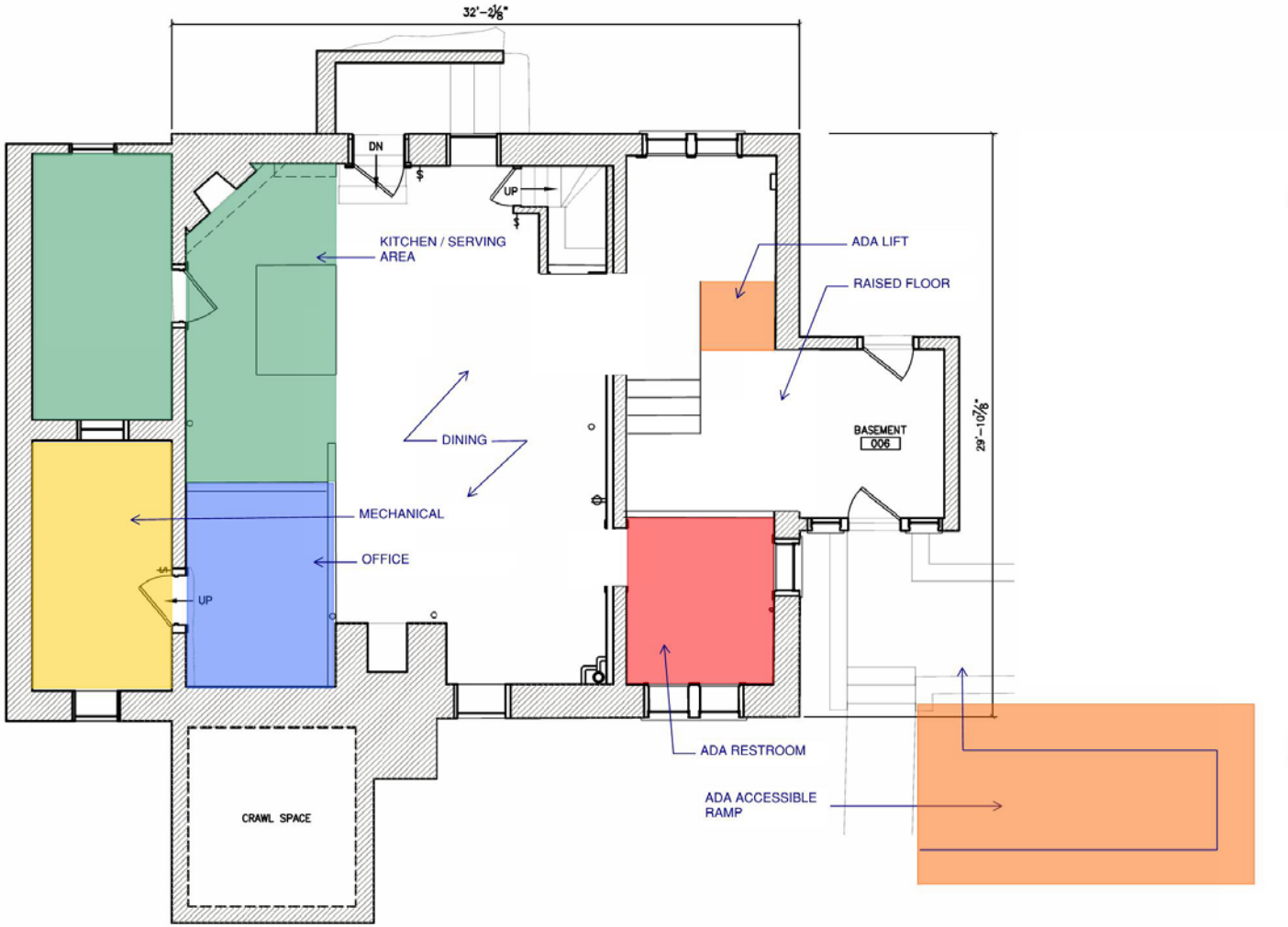
2017 (QEA)

Potential Use Schematic B



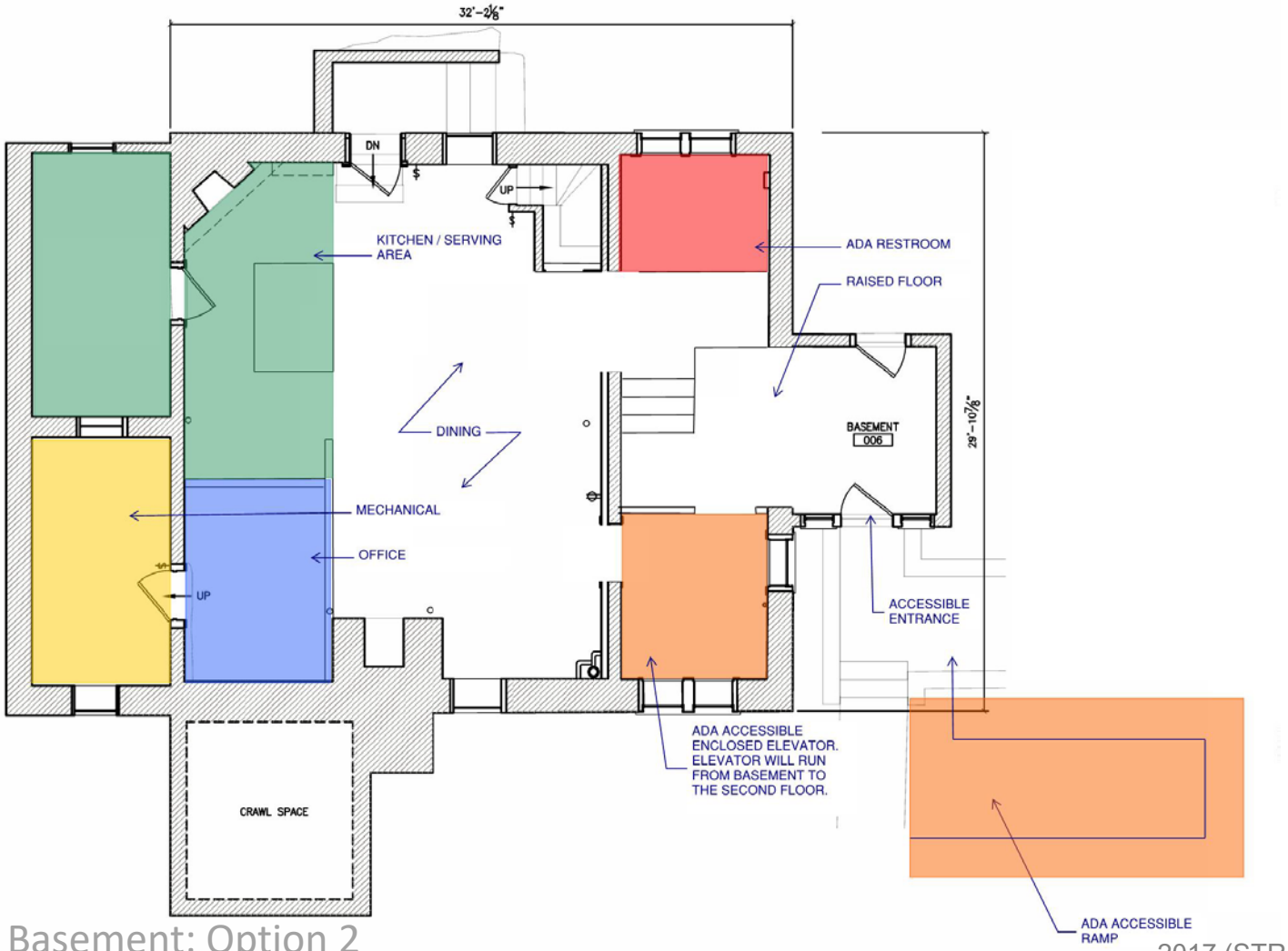
2017 (QEA)

Potential Use Concept C



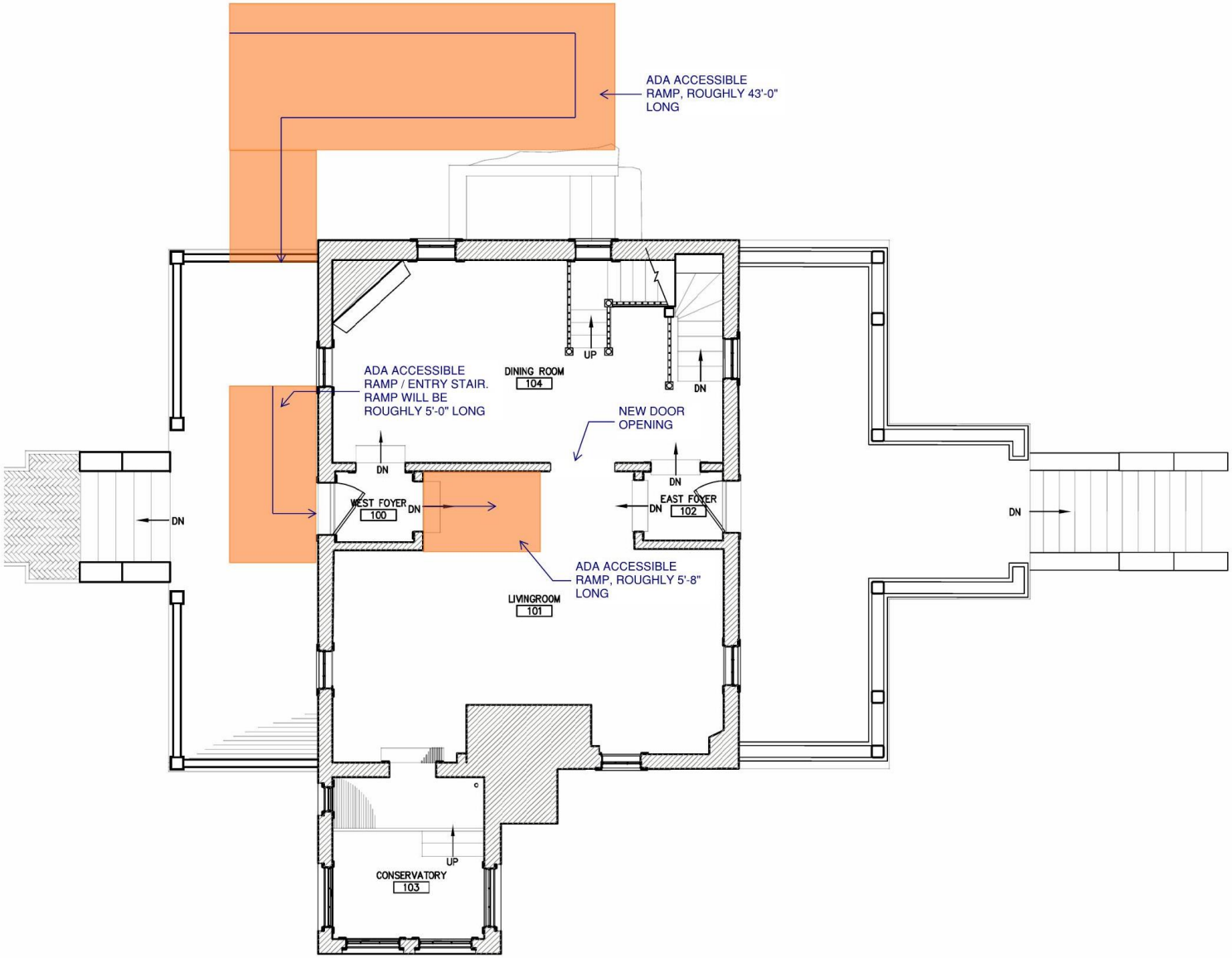
2017 (STRATA)

MAIN HOUSE – Basement: Option 1



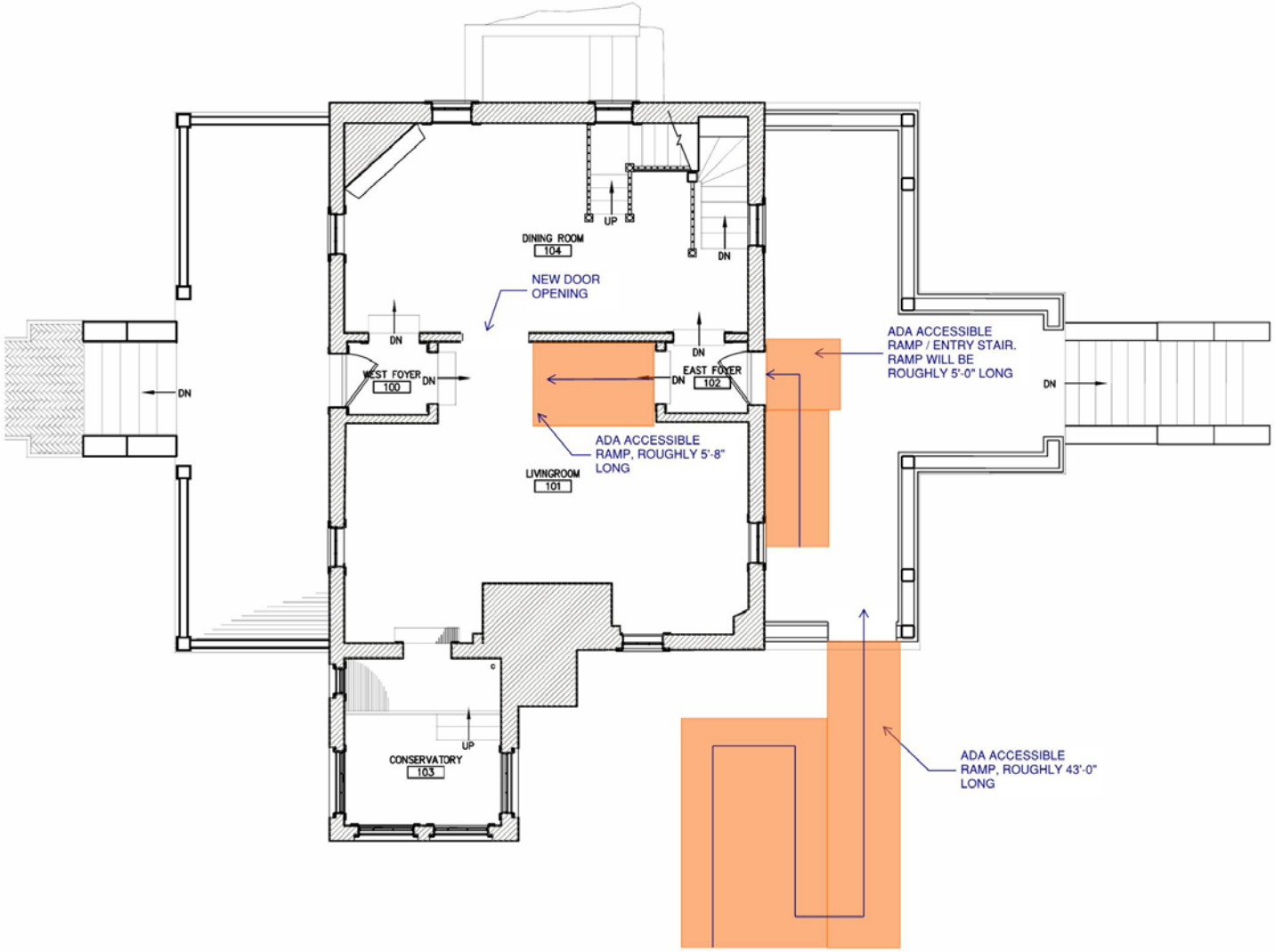
MAIN HOUSE – Basement: Option 2

2017 (STRATA)



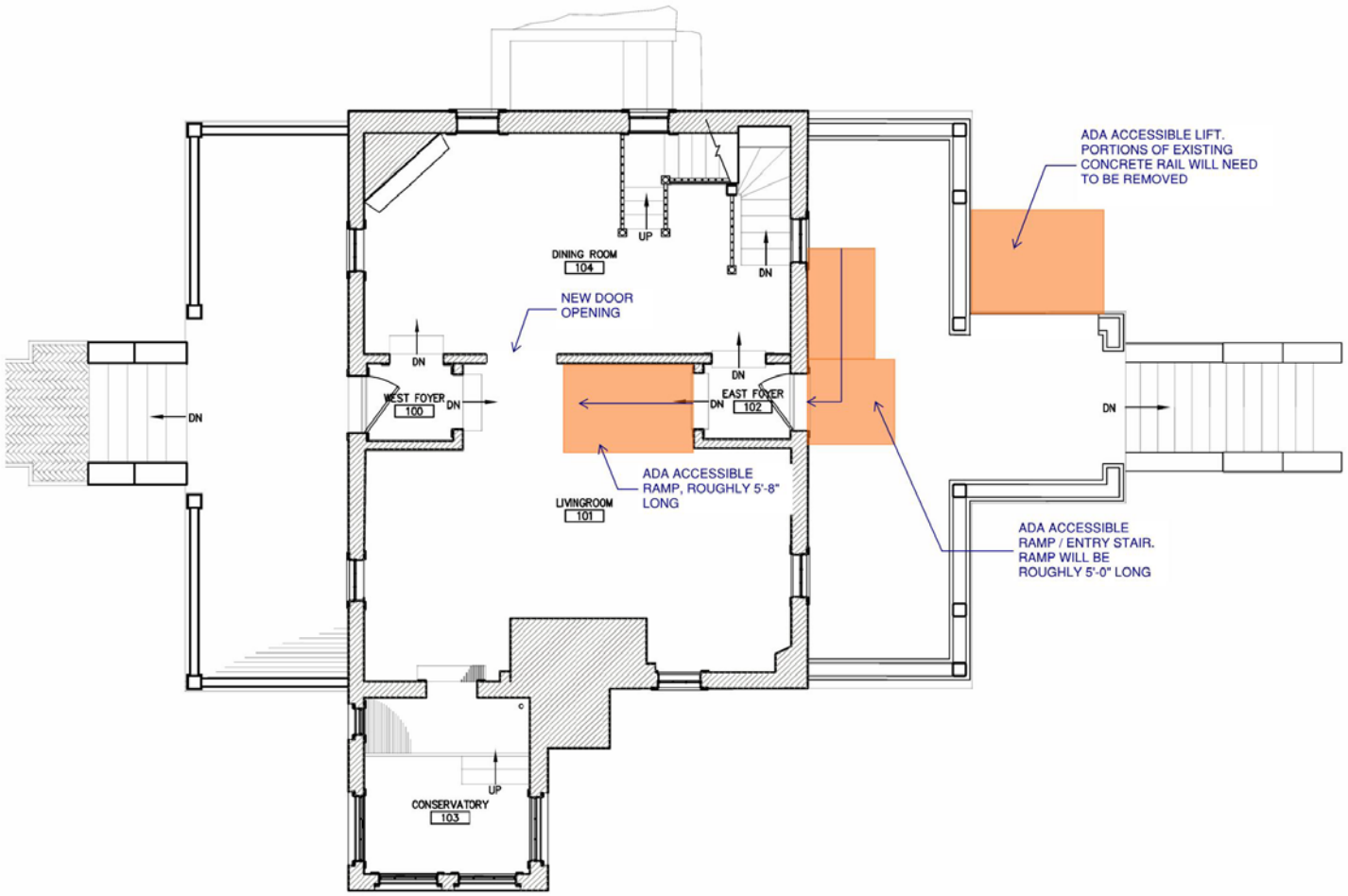
MAIN HOUSE – First Floor: Opt. 1A

2017 (STRATA)



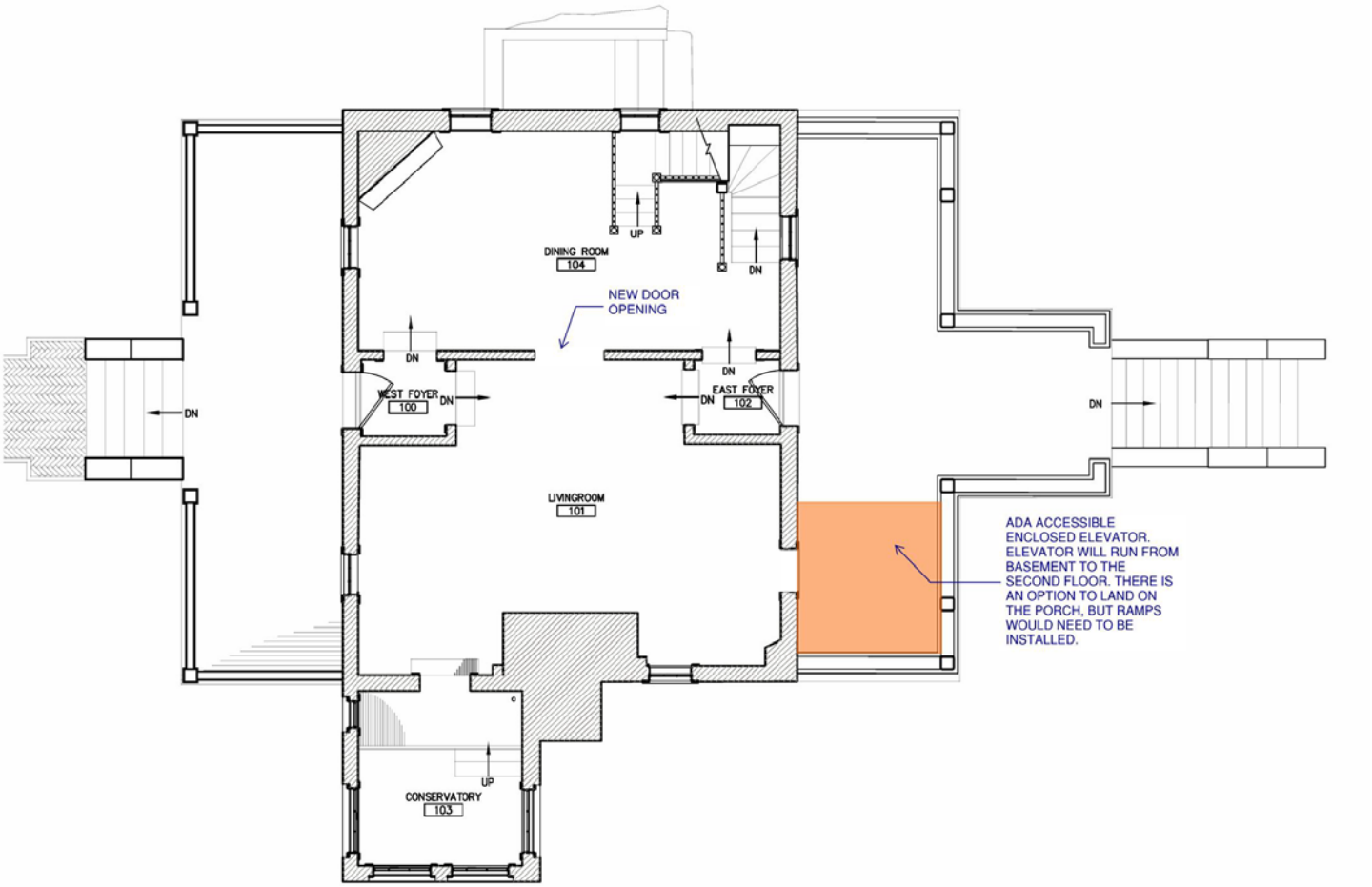
MAIN HOUSE – First Floor: Opt. 1B

2017 (STRATA)



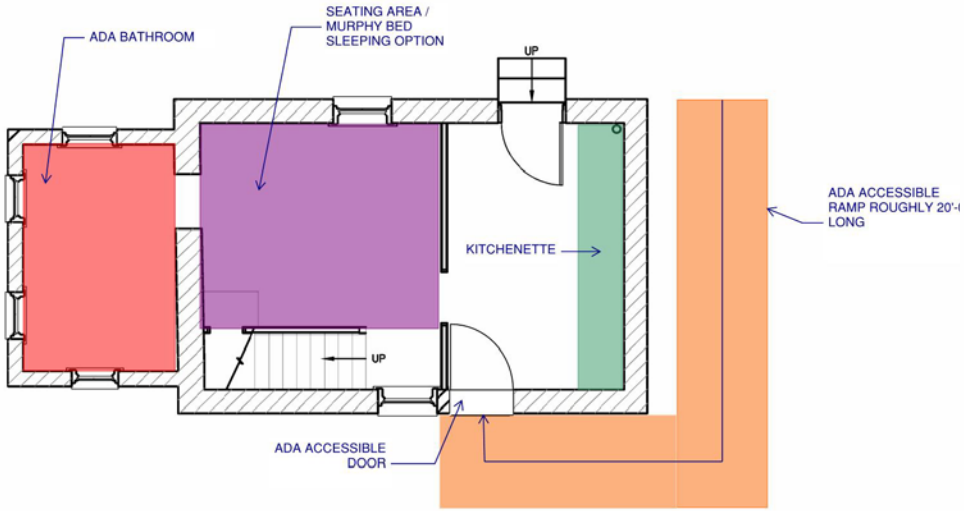
MAIN HOUSE – First Floor: Option 2

2017 (STRATA)

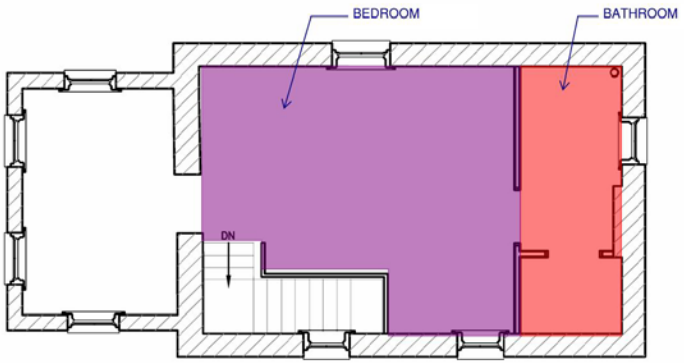


MAIN HOUSE – First Floor: Option 3

2017 (STRATA)



1 A2 EXISTING FIRST FLOOR PLAN
1/4" = 1'-0"



1 A2 EXISTING SECOND FLOOR PLAN
1/4" = 1'-0"

2017 (STRATA)

BRICK HOUSE: Option



REVIEW AND DISCUSS USE AND TREATMENT ALTERNATIVES

2017 (STRATA)

NEXT STEPS AND ACTION ITEMS



2017 (STRATA)



THANK YOU!



Bailly Homestead, view looking south (STRATA 2017)

I LANDSCAPE TREATMENT ALTERNATIVES

Appendix I. Landscape Treatment Alternatives

Landscape Treatment Alternatives

This appendix summarizes landscape treatment alternatives considered for providing site access and options for enhancing historic landscape character to support interpretive programs at the Bailly Homestead. The alternatives were discussed at a workshop held at Indiana Dunes National Lakeshore (INDU) on August 28 and 29, 2017.

Treatment Components Common to All Concepts

All landscape treatment alternatives shared common objectives based on possible future site use programs. The NPS and its partners will develop the site use program in the future. Treatment objectives that pertain to each alterative include the following:

- Protection of contributing landscape features;
- Rehabilitation of historic spatial organization that divides the site between the southern domestic landscape and the northern farm to allow for the interpretation of the domestic landscape;
- Rehabilitation of historic circulation patterns (Figure I.1);
- Repair of entry drive slope and allée;
- Addition of expanded parking areas including ADA parking;
- Maintenance of existing trail connections.

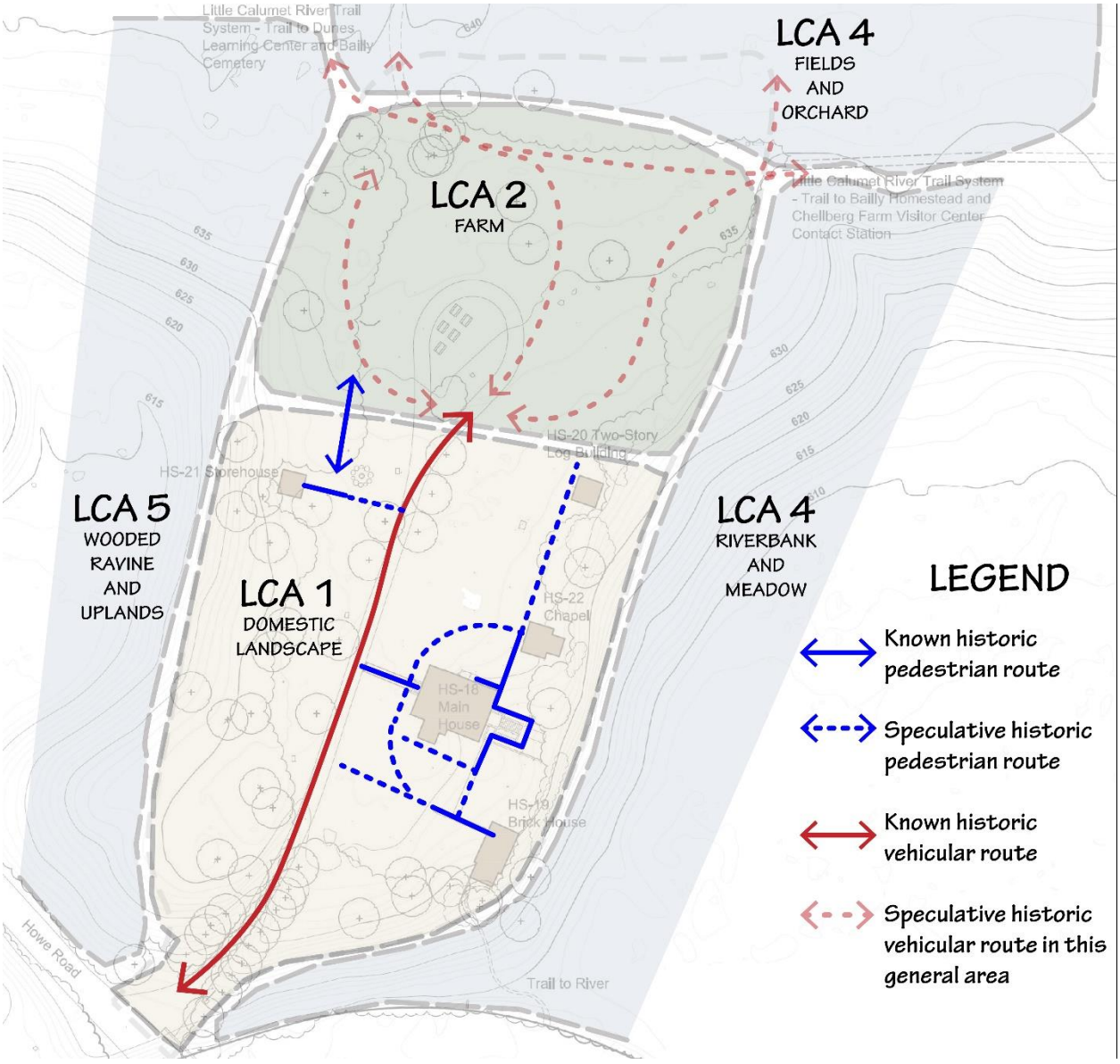


Figure I.1. Historic circulation pattern with known and speculative circulation routes. (QEA 2017)

Landscape Concept A

Landscape Concept A organizes the Bailly Homestead landscape into north and south zones. Rehabilitation and interpretation of the domestic landscape occur in the south while parking is accommodated in the northeast. Parking is screened from the domestic landscape and follows the general alignment of the buildings on the plateau of the site. Placement of parking in this location allows for a connection to the existing Little Calumet River Trail and for the interpretation of a historic trail near the Storehouse. Pedestrian connections through the site occur west of the Entry Drive in this concept. Repair of the Entry Drive includes regrading and replanting the allée as part of the rehabilitation of the domestic landscape.

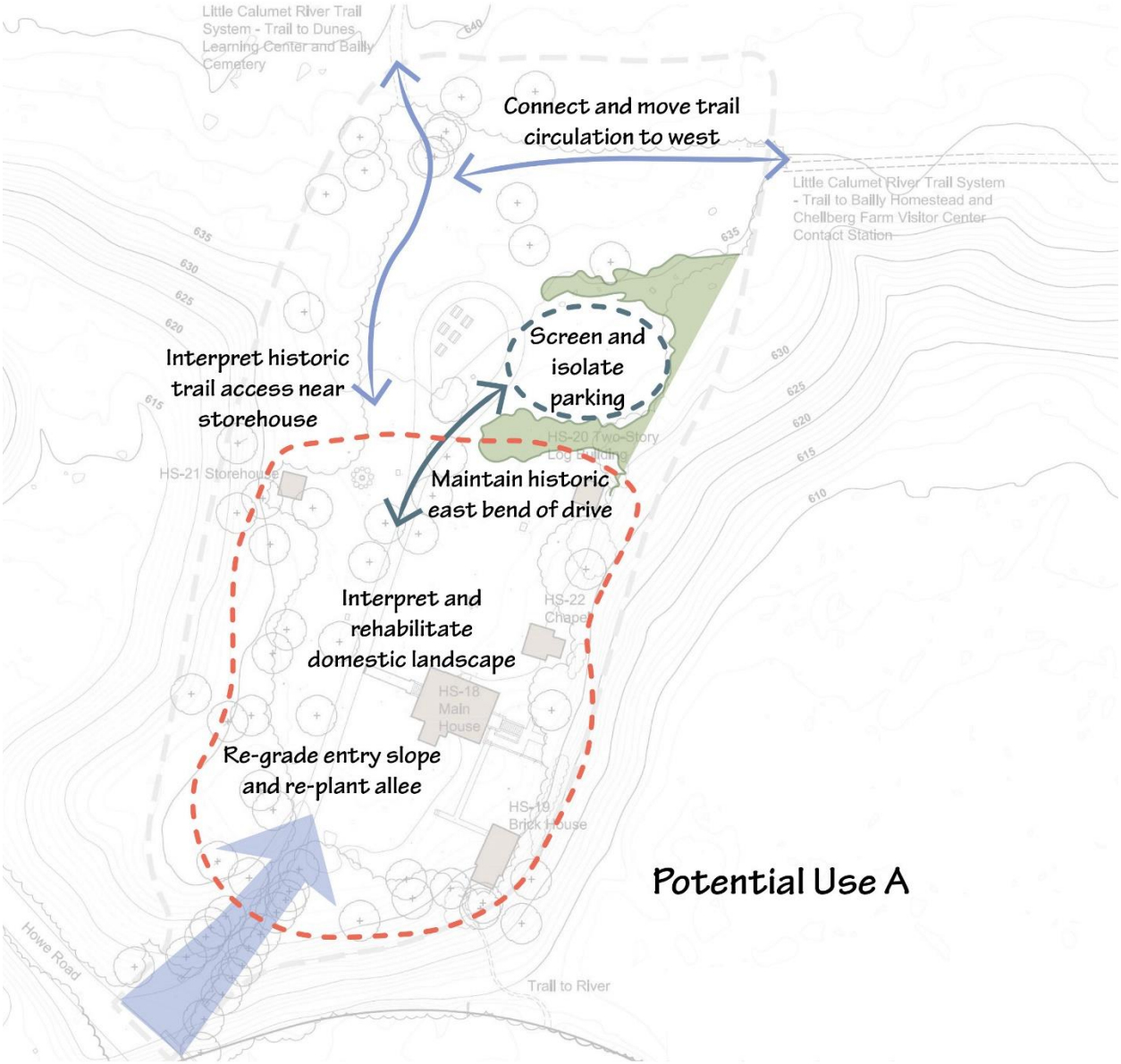


Figure I.2. Landscape Concept A Diagram. (QEA 2017)

Landscape Concept B

Landscape Concept B organizes the Bailly Homestead landscape into north and south zones and locates parking in the northwestern portion of the site. Screening of the parking area supports the rehabilitation and interpretation of the domestic landscape to the south. Locating parking away from the eastern edge of the plateau maintains an open area to the northeast that offers the ability to interpret an orchard. Trail connections link to the Little Calumet River Trail and enter the core of the domestic landscape through the interpretive orchard on the east side of the Bailly Homestead. Repair of the Entry Drive includes regrading and replanting the allée as part of the rehabilitation of the domestic landscape.

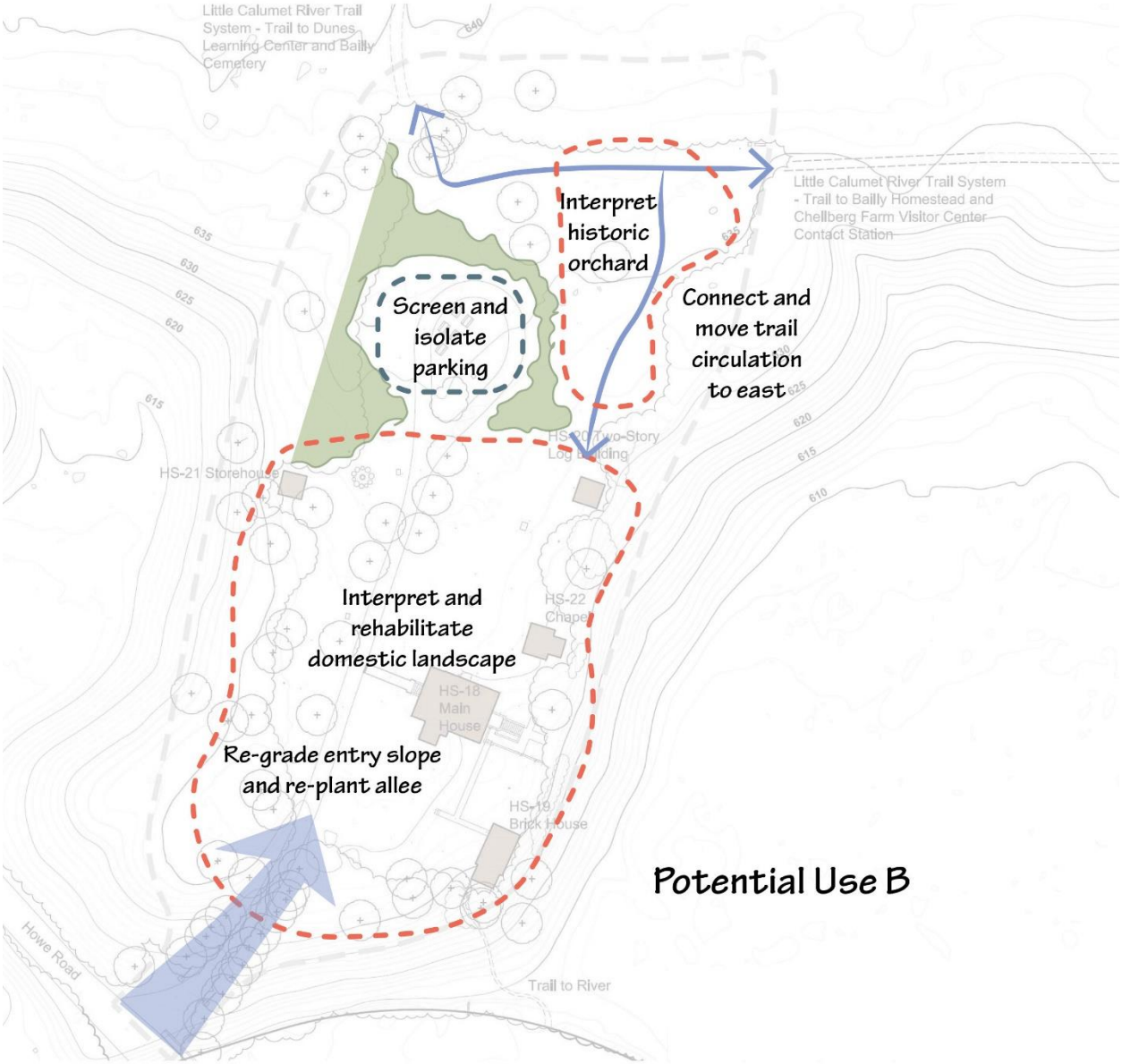


Figure I.3. Landscape Concept B Diagram. (QEA 2017)

Landscape Concept C

Landscape Concept C maintains the existing, open connections across the landscape of the Bailly Homestead. Limited accessible parking is located in the domestic landscape directly west of the Brick House and south of the Main House. Universal access to buildings is provided by the rehabilitation of historic circulation patterns. Rehabilitation and interpretation of the domestic landscape includes repair of the allée and interpretation of an orchard north of the buildings on site. Trails in the north of the site connect to the Little Calumet River Trail and enter the core of the domestic landscape through the interpretive orchard on the east side of the Bailly Homestead.

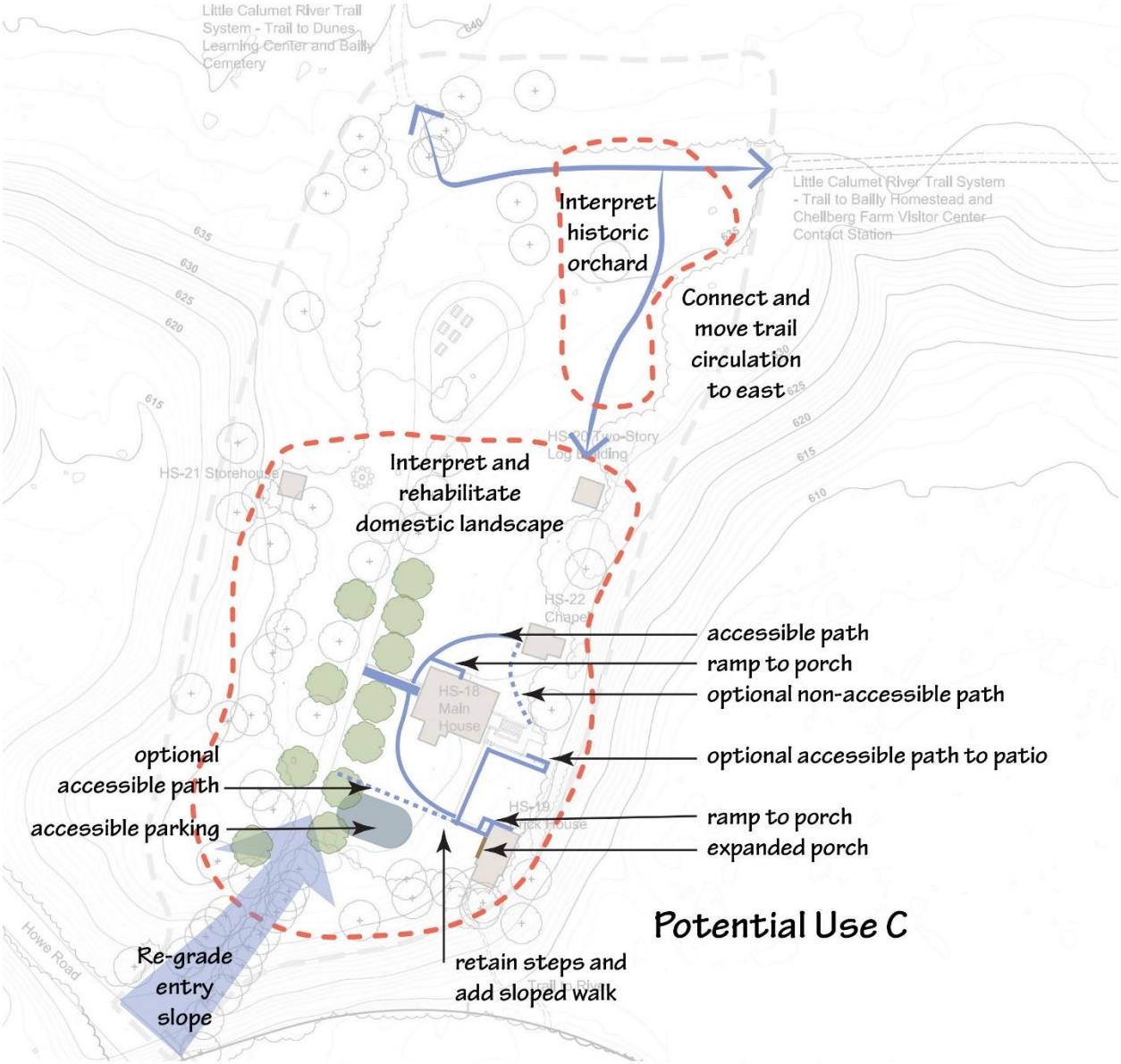


Figure I.4. Landscape Concept C Diagram. (QEA 2017)

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Bailly Homestead, view looking southwest. (STRATA 2017)

J TREE INVENTORY

Appendix J. Tree Inventory

Freestanding and large (12-inch diameter at breast height and greater) trees in the wooded edges of the Bailly Homestead were inventoried for species and condition during the June 2017 field investigations using Comprehensive Condition Assessment Report forms.[358] This appendix includes a summary of the results of the inventory and the individual survey forms for each tree. Inventoried trees are presented on CLR Analysis Drawing: Exiting Landscape Tree Inventory (EL3) located in Chapter 3.

Of the 58 individual trees inventoried, common species include black locust (*Robinia pseudoacacia*), sugar maple (*Acer saccharum*), black walnut (*Juglans nigra*), red maple (*Acer rubrum*), and white ash (*Fraxinus americana*). Seventeen trees were in good condition, 20 trees in fair condition, and 13 trees in poor condition. Eight of the surveyed trees were standing dead. Of the poor condition and dead trees, six pose a risk to nearby structures or features. Many of the surveyed trees supported extensive poison ivy (*Toxicodendron radicans*) and Virginia creeper (*Parthenocissus quinquefolia*) vines.

Conditions vary across the site and are summarized in the following table.

Table J.1. Bailly Homestead Tree Conditions

Condition Code	Condition	Count	Percent (%)
A	Excellent	0	0
B	Good	17	29
C	Fair	20	35
D	Poor	13	22
E	Dead	8	14

In addition to conditional coding, six trees were identified as “at-risk” for the presence of a defect that has potential to fail with nearby target of concern such as a building or visitor route.

A small number of trees have historic values. Four trees along the western, wooded edge of LCA 1: Domestic Landscape and one tree in the allée near the Main House contain embedded remnants of historic fencing or overhead wires in their trunks. Along the Entry Drive, the dispersed group of 16 black locust, red maple, and sugar maple trees are a vestige of the historic allée pattern that was replanted at various times since the mid-to-late 1800s.

[358] Olmsted Center for Landscape Preservation, *Comprehensive Condition Assessment Report – Tree* (Boston: Massachusetts, US Department of the Interior, National Park Service, Olmsted Center for Landscape Preservation, 2010).

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Brick House interior detail. (STRATA 2017)

K MAGNITUDE OF COST ESTIMATES

CONSTRUCTION MANAGEMENT RESOURCES, LLC
ESTIMATING • SCHEDULING • PROJECT MANAGEMENT • CONSULTING
5201 JOHNSON DRIVE, SUITE 330, MISSION, KANSAS 66205 (913) 262-6715 • FAX (913) 262-1380

Cultural Landscape and Historic Structures Report - Bailly Homestead
Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION	Immediate	Short Term	Long Term
Summary			
HS18 - Main House	17,194	-	1,604,859
HS19 - 2 Story Brick House Option 1	14,911	1,802	571,493
HS19 - 2 Story Brick House Option 2	14,911	1,802	590,367
HS20 - 2 Story Log House	1,429	38,008	67,564
HS21 - Storehouse	-	-	40,099
HS22 - Chapel	2,029	38,780	71,199
ADA Overnight Accommodations	-	-	197,043
Landscape	79,661	-	632,147
Site Utilities	-	-	504,158

***NOTE: Costs do not include archeological monitoring**
***NOTE: Costs do not include additional design or engineering fees**

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Cultural Landscape and Historic Structures Report - Bailly Homestead
Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION		Immediate	Short Term	Long Term
HS18 - Main House				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		1,718	-	160,313
02 41 00 DEMOLITION		-	-	26,280
02 50 00 HAZARDOUS MATERIAL ABATEMENT		-	-	85,478
03 30 00 CAST-IN-PLACE CONCRETE		-	-	1,589
04 01 20 EXTERIOR RESTORATION AND CLEANING		-	-	131,780
05 12 00 STEEL		-	-	120,100
06 13 00 ROUGH CARPENTRY		8,950	-	100,045
06 40 16 INTERIOR ARCHITECTURAL WOODWORK		-	-	27,089
07 30 00 INSULATION		-	-	15,934
07 50 00 ROOFING		2,500	-	38,217
08 11 00 DOOR & FRAMES		-	-	56,250
09 20 00 GYPSUM		-	-	29,216
09 30 00 TILE		-	-	20,582
09 95 00 WOOD FLOOR		-	-	8,260
09 90 00 PAINTING		-	-	24,500
10 28 00 TOILET AND BATH ACCESSORIES		-	-	4,810
11 40 00 FOOD SERVICE EQUIPMENT		-	-	12,700
22 00 00 PLUMBING		-	-	74,450
23 00 00 HVAC		-	-	125,646
26 00 00 ELECTRICAL		-	-	76,391
31 20 00 EARTH MOVING		-	-	19,590
32 13 13 CEMENT CONCRETE PAVING		-	-	32,345
33 10 00 WATER DISTRIBUTION		-	-	19,000
33 30 00 SANITARY SEWERAGE		-	-	11,500
33 51 00 NATURAL GAS DISTRIBUTION		-	-	7,000
subtotal		13,168	-	1,229,065
Contractor's Fee	8%	1,053	-	98,325
subtotal		14,221	-	1,327,390
Design/Estimate Contingency	15%	2,133	-	199,108
subtotal		16,354	-	1,526,498
Escalation to Mid-Point - 01/14/2020	5.1%	840	-	78,361
TOTAL		**17,194**	**-**	**1,604,859**

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DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS18 - Main House					
02 41 00 DEMOLITION					
Demo Ceiling in Basement	in haz/mat				0
Demo Walls in Basement	384 SF	1.25			480
Selective Demolition	1 LS	20,800.00			20,800
Shore and remove Steel Beams in Basement	2 EA	1,250.00			2,500
Shore and remove Steel Beams in Parlor 101	2 EA	1,250.00			2,500
			0	0	26,280
02 50 00 HAZARDOUS MATERIAL ABATEMENT					
Lead Based Paint Abatement ALLOW	1 LS	47,905.00			47,905
Long Term Abate Asbestos Interior	1 LS	21,872.50			21,873
Long Term Abate Asbestos Roofing Underlayment	1 LS	15,700.00			15,700
			0	0	85,478
03 30 00 CAST-IN-PLACE CONCRETE					
Concrete Footing for Posts	2 EA	500.00			1,000
Restore Concrete Steps	1 LS	350.00			350
Install Vapor barrier	80 SF	3.00			239
			0	0	1,589
04 01 20 EXTERIOR RESTORATION AND CLEANING					
Repair Wood Trim	1 LS	25,000.00			25,000
New Wood Trim	1 LS	25,000.00			25,000
Spot Repoint Brick/Stone/Cast Stone	1 LS	6,500.00			6,500
Clean Exterior Masonry	1 LS	3,500.00			3,500
Replace Cast Stone	1 LS	3,200.00			3,200
Repair Chimney and Install Cap	1 LS	1,500.00			1,500
Repair and Restore Windows	42 EA	800.00			33,600
New Storm Windows	42 EA	250.00			10,500
Restore Historic Doors and Screen Doors	5 EA	650.00			3,250
Exterior Wood Trim and Railing Repair and Replacement	1 LS	6,500.00			6,500
Clean and Seal East Porch and Steps	396 SF	5.00			1,980
Install Steel lintel @ Opening 1-002	1 EA	1,500.00			1,500
Repair Brick Chimney, Replace Lintel, Install Gas Logs, Install Exhaust, Repair Mantl	1 LS	4,500.00			4,500
Repair and Refurbish Parlor Fireplace Surround Convert to gas	1 LS	3,750.00			3,750
Underpin NE Wall Entry 0006	1 LS	1,500.00			1,500
			0	0	131,780
05 12 00 STEEL					
Install W8 Steel Beams	4 EA	4,500.00			18,000
Install Steel Posts	8 EA	1,500.00			12,000
Install W6 Steel Beams	6 EA	3,500.00			21,000
Modify Wood Beams	28 EA	1,200.00			33,600
Shoring @ Modify Wood Beams	28 EA	750.00			21,000
Modify/Shore Log Wall Pocket Beams	12 EA	750.00			9,000
New Exterior Steel Handrails	44 LF	125.00			5,500
			0	0	120,100
06 13 00 ROUGH CARPENTRY					
Install Supplemental Floor Joists	8 EA	250.00			2,000
Install LVL Floor Joists	8 EA	650.00			5,200
Install Ledger @ South Wall	1 LS	600.00			600
Porch Option 2 Wood Boardwalk	see landscaping				0
Int Wood Framed Walls	803 SF	3.50			2,810
Remove and Install New Front Porch Decking	234 SF	25.00			5,841
Repair and Restore Wood Steps from Basement for 3rd Floor	1 LS	8,500.00			8,500
Sister Joists @nd Floor	3 EA	150.00			450
Consolidate Wood Beam in Dining Room	1 EA	850.00			850
Remove and Reframe Existing Roof Frame	1,475 SF	45.00			66,393
Structural Modifications to Stair from basement to 1st floor	1 LS	3,600.00			3,600
Structural Modifications to Stair from 2nd to 3rd floor	1 LS	1,200.00			1,200
Log Repair (top logs west wall)	1 LS	2,600.00			2,600
Shoring @ Wood Stairs	1 LS	3,750.00	3,750		
Shoring @ Roof Framing	1 LS	5,200.00	5,200		
			8,950	0	100,045
06 40 16 INTERIOR ARCHITECTURAL WOODWORK					
Wood Steps @ Conservatory	2 EA	300.00			600
Wood Railing @ Conservatory	12 LF	50.00			600
Beaded Wood Board @ Conservatory Ceiling	80 SF	17.50			1,391
Refresh Wood in Dining Room	1 LS	7,000.00			7,000
Install wood Wall Rail @ Stairs	12 LF	50.00			600
Kitchen Counter Island	13 LF	425.00			5,429
Kitchen Base Cabinet w/ Countertop	21 LF	350.00			7,299
Kitchen Wall Cabinet	21 LF	200.00			4,171
			0	0	27,089
07 30 00 INSULATION					
Floor Insulation	3,563 SF	2.00			7,126
Insulate Attic	1,475 SF	4.00			5,902
Exterior Wall Insulation	1,163 SF	2.50			2,907
			0	0	15,934
07 40 00 WATERPROOFING					
Water Proof Coating in Rooms 002, 003	370 SF	2.00			740
			0	0	740

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS18 - Main House					
07 50 00 ROOFING					
Wood Shingle Roofing Maintenance	1 LS	2,500.00	2,500		
Replicate Conservatory Glass Roof	1 LS	15,000.00			15,000
New Long Term Wood Shingle Roofing	1,697 SF	10.00			16,967
Gutter	150 LF	35.00			5,250
Downspout	40 LF	25.00			1,000
			2,500	0	38,217
08 11 00 DOOR & FRAMES					
New Back Entry Door/Frame/Hardware w/ new lintel	1 EA	6,500.00			6,500
Repair and Restore Exterior Basement Doors	3 EA	4,500.00			13,500
Repair and Restore Interior Doors	10 EA	2,500.00			25,000
Interior Door/Frame/Hardware	5 EA	2,250.00			11,250
			0	0	56,250
09 20 00 GYPSUM					
Lath and Blue Gypsum Board w/ 2 coats of Plaster	121 SF	12.00			1,450
Lath and Blue Gypsum Board w/ 2 coats of Plaster	298 SF	12.00			3,577
Furr and Install Gypsum Board on Ceiling	1,107 SF	3.00			3,322
Install Gypsum Board on Ceiling	1,517 SF	2.00			3,034
Furr and Install Gypsum Board on Walls	399 SF	3.00			1,196
Install Gypsum Board on Existing Walls	1,773 SF	3.00			5,319
Install Gypsum Board on Walls	1,606 SF	3.00			4,818
Restore 1st and 2nd Floor Plaster Walls	1 LS	6,500.00			6,500
			0	0	29,216
09 30 00 TILE					
Prep Floor & Install Floor Tile	884 SF	15.00			13,261
Tile @ RR Floor	192 SF	10.00			1,922
Tile @ RR Walls	675 SF	8.00			5,398
			0	0	20,582
09 95 00 WOOD FLOOR					
Remove Wood Flooring @ Conservatory and Re-Install	80 SF	3.50			279
Refinish Wood Flooring	729 SF	4.00			2,915
New Wood Flooring	633 SF	8.00			5,066
			0	0	8,260
09 90 00 PAINTING					
Paint Interior Stair and Walls	1 LS	15,000.00			15,000
Prep, Prime and Paint Exterior	1 LS	9,500.00			9,500
			0	0	24,500
10 28 00 TOILET AND BATH ACCESSORIES					
Soap Disp	6 EA	45.00			270
Mirror 1'11x5'	6 EA	250.00			1,500
TP Dispenser	6 EA	40.00			240
Grab Bars	2 EA	75.00			150
Shower Curtain/ Rod	5 EA	100.00			500
ADA Shower Seat	2 EA	150.00			300
Fire Extinguisher	4 EA	150.00			600
Fire Escape Ladder	5 EA	250.00			1,250
			0	0	4,810
11 40 00 FOOD SERVICE EQUIPMENT					
Gas Stove	1 EA	4,500.00			4,500
Dishwasher	1 EA	1,850.00			1,850
Refrigerator	1 EA	3,500.00			3,500
Freezer	1 EA	2,850.00			2,850
			0	0	12,700
21 00 00 FIRE SUPRESSION					
Sprinkler System	3,306 SF	5.00			16,528
Fire Suppression Hood/Exhaust	1 EA	4,500.00			4,500
			0	0	21,028
22 00 00 PLUMBING					
Water Closet	6 EA	2,900.00			17,400
Wall Hung Lavatory	6 EA	2,750.00			16,500
Kitchen Sink	1 EA	2,950.00			2,950
Shower/Tub	5 EA	3,500.00			17,500
Water Heater	1 LS	8,500.00			8,500
Hose Bibbs	2 EA	1,850.00			3,700
Laundry Hookup	1 EA	1,500.00			1,500
Floor Drains	3 EA	850.00			2,550
Gas Piping	4 EA	650.00			2,600
Replace Existing Areaway drain	1 EA	1,250.00			1,250
			0	0	74,450
23 00 00 HVAC					
HVAC VRF System	3,306 SF	35.00			115,696
Exhaust fan in Kitchen (rated duct in existing flue)	1 EA	6,500.00			6,500
Exhaust fan in RR	5 EA	350.00			1,750
Vents in Crawl Space	2 EA	850.00			1,700
			0	0	125,646

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS18 - Main House					
26 00 00 ELECTRICAL					
Site	1 LS	5,000.00			5,000
Grounding	3,306 SF	0.75			2,479
Lightning Protection	1,500 SF	1.50			2,250
Lighting	3,306 SF	9.00			29,751
Power	3,306 SF	2.00			6,611
Distribution	3,306 SF	6.00			19,834
Telephone	1 EA	250.00			250
Data (Wireless)	1 EA	300.00			300
Fire Alarm/Security	3,306 SF	3.00			9,917
			0	0	76,391
31 20 00 EARTH MOVING					
Excavate Perimeter	212 CY	25.00			5,308
Install Perimeter Drain	224 LF	15.00			3,359
Install Bentonite Waterproofing	1,433 SF	3.50			5,016
Backfill	212 CY	12.00			2,548
Regrade/Reseed Perimeter	2,687 SF	1.25			3,359
			0	0	19,590
32 13 13 CEMENT CONCRETE PAVING					
New Ramp	310 SF	12.00			3,720
New Steps	15 SF	25.00			375
New Steps @ door 1-001 and 1-006	30 SF	25.00			750
New Walls for Ramp	110 SF	25.00			2,750
New Railing @ Ramp	138 LF	125.00			17,250
New Railing @ Steps	60 LF	125.00			7,500
			0	0	32,345
33 10 00 WATER DISTRIBUTION					
2" Ø PVC Water Line	200 LF	30.00			6,000
6" Ø PVC Fire Water Line	200 LF	65.00			13,000
			0	0	19,000
33 30 00 SANITARY SEWERAGE					
4" Ø PVC Sanitary Sewer	200 LF	45.00			9,000
Grease Interceptor	1 LS	2,500.00			2,500
			0	0	11,500
33 51 00 NATURAL GAS DISTRIBUTION					
1" Ø Gas Line	200 LF	35.00			7,000
			0	0	7,000

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CONSTRUCTION MANAGEMENT RESOURCES, LLC
ESTIMATING • SCHEDULING • PROJECT MANAGEMENT • CONSULTING
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Cultural Landscape and Historic Structures Report - Bailly Homestead
Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION		Immediate	Short Term	Long Term
HS19 - 2 Story Brick House Option 1				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		1,490	180	57,088
02 41 00 DEMOLITION		-	-	21,155
02 50 00 HAZARDOUS MATERIAL ABATEMENT		-	-	52,968
03 30 00 CAST-IN-PLACE CONCRETE		-	-	4,097
04 01 20 EXTERIOR RESTORATION AND CLEANING		-	-	88,761
05 12 00 STEEL		2,250	-	-
06 13 00 ROUGH CARPENTRY		7,680	-	18,264
06 40 16 INTERIOR ARCHITECTURAL WOODWORK		-	-	11,500
07 30 00 INSULATION		-	-	3,073
07 50 00 ROOFING		-	1,200	11,500
08 11 00 DOOR & FRAMES		-	-	6,400
08 52 00 WOOD WINDOWS		-	-	850
09 20 00 GYPSUM		-	-	7,935
09 95 00 WOOD FLOOR		-	-	3,685
09 90 00 PAINTING		-	-	3,878
10 28 00 TOILET AND BATH ACCESSORIES		-	-	6,620
22 00 00 PLUMBING		-	-	23,200
23 00 00 HVAC		-	-	31,277
26 00 00 ELECTRICAL		-	-	65,172
31 20 00 EARTH MOVING		-	-	500
33 10 00 WATER DISTRIBUTION		-	-	6,000
33 30 00 SANITARY SEWERAGE		-	-	6,750
33 51 00 NATURAL GAS DISTRIBUTION		-	-	7,000
subtotal		11,420	1,380	437,672
Contractor's Fee	8%	914	110	35,014
subtotal		12,333	1,490	472,686
Design/Estimate Contingency	15%	1,850	224	70,903
subtotal		14,183	1,714	543,588
Escalation to Mid-Point - 01/14/2020	5.1%	728	88	27,904
TOTAL		**14,911**	**1,802**	**571,493**

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DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS19 - 2 Story Brick House Option 1					
02 41 00 DEMOLITION					
Selective Demolition Allowance	1 LS	15,000.00			15,000
Selective Demolition MEP	1,231 SF	5.00			6,155
			0	0	21,155
02 50 00 HAZARDOUS MATERIAL ABATEMENT					
Lead Based Paint Abatement ALLOW	1 LS	23,595.00			23,595
Long Term Abate Asbestos Interior	1 LS	21,872.50			21,873
Long Term Abate Asbestos Roofing Underlayment	1 LS	7,500.00			7,500
			0	0	52,968
03 30 00 CAST-IN-PLACE CONCRETE					
Install Vapor barrier and Mud slab	512 SF	8.00			4,097
			0	0	4,097
04 01 20 EXTERIOR RESTORATION AND CLEANING					
Restore Window Sashes - Long Term	15 EA	1,200.00			18,000
New Storm Windows	15 EA	550.00			8,250
Repair Wood Trim	1 LS	1,500.00			1,500
Remove Unused accessories and mud daubers nests	1 LS	650.00			650
Repair bulge in masonry on south elevation	1 LS	3,000.00			3,000
Clean & Repoint Building	2,071 SF	20.00			41,411
Relay brick at window 103	1 EA	800.00			800
Remove and replace Cast Stone Window Sill	1 EA	650.00			650
Sealant Installation	1 LS	500.00			500
Remove and replace vertical expansion joint	40 VF	25.00			1,000
Repair Chimney	1 EA	5,000.00			5,000
Infill Foundation Vents	2 EA	750.00			1,500
Install Steel lintel @ Opening 001	1 EA	1,500.00			1,500
Rebuild Brick Arch at Basement Door	1 EA	2,500.00			2,500
Spot Repoint Interior Basement Walls	1 LS	2,500.00			2,500
			0	0	88,761
05 12 00 STEEL					
Portable Stair @ Basement	1 LS	2,250.00	2,250		
			2,250	0	0
06 13 00 ROUGH CARPENTRY					
Structural Stabilization @ 1st Floor Entry	1 LS	2,500.00	2,500		
Structural Stabilization @ Below Room 102	1 LS	3,000.00			3,000
Structural Stabilization @ Above Room 003	1 LS	1,500.00			1,500
Structural Stabilization @ Above Room 202	1 LS	3,000.00			3,000
Canopy w/ Brackets Structure	30 SF	35.00			1,050
Small Porch, Steps and rails	30 SF	65.00			1,950
Porch Option 2 Wood Boardwalk	see landscaping				0
Int Wood Framed Walls	81 SF	3.50			284
Secure Roof Rafters	15 EA	20.00			300
Attic Hatch (reframe as required)	1 LS	2,000.00			2,000
Reinforce Sill Plate and Attach Rafters	1 LS	5,180.00	5,180		5,180
			7,680	0	18,264
06 40 16 INTERIOR ARCHITECTURAL WOODWORK					
Interior Wood Trim	1 LS	1,800.00			1,800
Restore Historic Staircase	1 LS	3,000.00			3,000
Install wood Guard Rail @ 2nd Floor	12 LF	100.00			1,200
Kitchen Base Cabinet w/ Countertop	10 LF	350.00			3,500
Kitchen Wall Cabinet	10 LF	200.00			2,000
			0	0	11,500
07 30 00 INSULATION					
Ceiling Insulation	512 SF	2.00			1,024
1st Floor Insulation	512 SF	4.00			2,048
			0	0	3,073
07 50 00 ROOFING					
Wood Shingle Roofing Maintenance	1 LS	1,200.00		1,200	
New Long Term Wood Shingle Roofing	804 SF	8.00			6,431
Gutter	88 LF	35.00			3,069
Downspout	80 LF	25.00			2,000
			0	1,200	11,500
08 11 00 DOOR & FRAMES					
New Front Door/Frame/Hardware	1 EA	3,000.00			3,000
Interior Door/Frame/Hardware	4 EA	850.00			3,400
			0	0	6,400
08 52 00 WOOD WINDOWS					
Replica Basement Window	1 EA	850.00			850
			0	0	850
09 20 00 GYPSUM					
Gypsum Board on Wood Framed Wall	162 SF	2.50			405
Gypsum Board on Ceiling	807 SF	2.00			1,614
Plaster Restoration	1,972 SF	3.00			5,916
			0	0	7,935

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS19 - 2 Story Brick House Option 1					
09 95 00 WOOD FLOOR					
Refinish Wood Flooring	406 SF	4.00			1,624
New Wood Flooring	258 SF	8.00			2,061
			0	0	3,685
09 90 00 PAINTING					
Prep, Prime and Paint Interior Gyp	2,134 SF	1.25			2,668
Prep, Prime and Paint Interior Gyp Ceiling	807 SF	1.50			1,210
			0	0	3,878
10 28 00 TOILET AND BATH ACCESSORIES					
Soap Disp	2 EA	45.00			90
Mirror 1'11x5'	2 EA	250.00			500
Full Height Mirror	2 EA	600.00			1,200
TP Dispenser	2 EA	40.00			80
Grab Bars	4 EA	75.00			300
Grab Bars @ Shower Two Wall	2 EA	125.00			250
Shower Curtain/ Rod	2 EA	100.00			200
ADA Shower Seat	2 EA	150.00			300
Fire Extinguisher	3 EA	150.00			450
Fire Escape Ladder	1 EA	250.00			250
Window Treatment	15 EA	200.00			3,000
			0	0	6,620
21 00 00 FIRE SUPRESSION					
Sprinkler System	1,231 SF	5.00			6,155
Fire Pump	1 EA	15,000.00			15,000
			0	0	21,155
22 00 00 PLUMBING					
Water Closet	2 EA	2,900.00			5,800
Wall Hung Lavatory	2 EA	2,750.00			5,500
Kitchen Sink	1 EA	2,750.00			2,750
Shower/Tub	2 EA	2,400.00			4,800
Water Heater	1 EA	3,500.00			3,500
Floor Drain in Basement	1 EA	850.00			850
			0	0	23,200
23 00 00 HVAC					
HVAC System Heat Pump(2), DOAS	1,231 SF	25.00			30,777
Exhaust fan in RR	2 EA	250.00			500
			0	0	31,277
26 00 00 ELECTRICAL					
Site	1 LS	5,000.00			5,000
Generator	1 LS	35,000.00			35,000
Lighting	1,231 SF	9.00			11,080
Power	1,231 SF	2.00			2,462
Distribution	1,231 SF	6.00			7,387
Telephone	1 LS	250.00			250
Data (Wireless)	1 LS	300.00			300
Fire Alarm/Security	1,231 SF	3.00			3,693
			0	0	65,172
31 20 00 EARTH MOVING					
Spot Regrade	1 LS	500.00			500
			0	0	500
33 10 00 WATER DISTRIBUTION					
2" Ø PVC Water Line	200 LF	30.00			6,000
			0	0	6,000
33 30 00 SANITARY SEWERAGE					
6" Ø PVC Sanitary Sewer	150 LF	45.00			6,750
			0	0	6,750
33 51 00 NATURAL GAS DISTRIBUTION					
1" Ø Gas Line	200 LF	35.00			7,000
			0	0	7,000

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Cultural Landscape and Historic Structures Report - Bailly Homestead
Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION		Immediate	Short Term	Long Term
HS19 - 2 Story Brick House Option 2				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		1,490	180	58,973
02 41 00 DEMOLITION		-	-	21,155
02 50 00 HAZARDOUS MATERIAL ABATEMENT		-	-	52,968
03 30 00 CAST-IN-PLACE CONCRETE		-	-	4,097
04 01 20 EXTERIOR RESTORATION AND CLEANING		-	-	88,761
05 12 00 STEEL		2,250	-	-
06 13 00 ROUGH CARPENTRY		7,680	-	19,398
06 40 16 INTERIOR ARCHITECTURAL WOODWORK		-	-	18,100
07 30 00 INSULATION		-	-	3,073
07 50 00 ROOFING		-	1,200	11,500
08 11 00 DOOR & FRAMES		-	-	10,600
08 52 00 WOOD WINDOWS		-	-	850
09 20 00 GYPSUM		-	-	10,160
09 95 00 WOOD FLOOR		-	-	3,685
09 90 00 PAINTING		-	-	4,688
10 28 00 TOILET AND BATH ACCESSORIES		-	-	6,620
22 00 00 PLUMBING		-	-	20,800
23 00 00 HVAC		-	-	31,277
26 00 00 ELECTRICAL		-	-	65,172
31 20 00 EARTH MOVING		-	-	500
33 10 00 WATER DISTRIBUTION		-	-	6,000
33 30 00 SANITARY SEWERAGE		-	-	6,750
33 51 00 NATURAL GAS DISTRIBUTION		-	-	7,000
subtotal		11,420	1,380	452,126
Contractor's Fee	8%	914	110	36,170
subtotal		12,333	1,490	488,296
Design/Estimate Contingency	15%	1,850	224	73,244
subtotal		14,183	1,714	561,541
Escalation to Mid-Point - 01/14/2020	5.1%	728	88	28,826
TOTAL		**14,911**	**1,802**	**590,367**

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS19 - 2 Story Brick House Option 2					
02 41 00 DEMOLITION					
Selective Demolition Allowance	1 LS	15,000.00			15,000
Selective Demolition MEP	1,231 SF	5.00			6,155
			0	0	21,155
02 50 00 HAZARDOUS MATERIAL ABATEMENT					
Lead Based Paint Abatement ALLOW	1 LS	23,595.00			23,595
Long Term Abate Asbestos Interior	1 LS	21,872.50			21,873
Long Term Abate Asbestos Roofing Underlayment	1 LS	7,500.00			7,500
			0	0	52,968
03 30 00 CAST-IN-PLACE CONCRETE					
Install Vapor barrier and Mud slab	512 SF	8.00			4,097
			0	0	4,097
04 01 20 EXTERIOR RESTORATION AND CLEANING					
Restore Window Sashes - Long Term	15 EA	1,200.00			18,000
New Storm Windows	15 EA	550.00			8,250
Repair Wood Trim	1 LS	1,500.00			1,500
Remove Unused accessories and mud daubers nests	1 LS	650.00			650
Repair bulge in masonry on south elevation	1 LS	3,000.00			3,000
Clean & Repoint Building	2,071 SF	20.00			41,411
Relay brick at window 103	1 EA	800.00			800
Remove and replace Cast Stone Window Sill	1 EA	650.00			650
Sealant Installation	1 LS	500.00			500
Remove and replace vertical expansion joint	40 VF	25.00			1,000
Repair Chimney	1 EA	5,000.00			5,000
Infill Foundation Vents	2 EA	750.00			1,500
Install Steel lintel @ Opening 001	1 EA	1,500.00			1,500
Rebuild Brick Arch at Basement Door	1 EA	2,500.00			2,500
Spot Repoint Interior Basement Walls	1 LS	2,500.00			2,500
			0	0	88,761
05 12 00 STEEL					
Portable Stair @ Basement	1 LS	2,250.00	2,250		
			2,250	0	0
06 13 00 ROUGH CARPENTRY					
Structural Stabilization @ 1st Floor Entry	1 LS	2,500.00	2,500		
Structural Stabilization @ Below Room 102	1 LS	3,000.00			3,000
Structural Stabilization @ Above Room 003	1 LS	1,500.00			1,500
Structural Stabilization @ Above Room 202	1 LS	3,000.00			3,000
Canopy w/ Brackets Structure	30 SF	35.00			1,050
Small Porch, Steps and rails	30 SF	65.00			1,950
Porch Option 2 Wood Boardwalk	see landscaping				0
Int Wood Framed Walls	405 SF	3.50			1,418
Secure Roof Rafters	15 EA	20.00			300
Attic Hatch (reframe as required)	1 LS	2,000.00			2,000
Reinforce Sill Plate and Attach Rafters	1 LS	5,180.00	5,180		5,180
			7,680	0	19,398
06 40 16 INTERIOR ARCHITECTURAL WOODWORK					
Interior Wood Trim	1 LS	1,800.00			1,800
Restore Historic Staircase	1 LS	3,000.00			3,000
Install wood Guard Rail @ 2nd Floor	12 LF	100.00			1,200
Reception Counter	12 LF	550.00			6,600
Kitchen Base Cabinet w/ Countertop	10 LF	350.00			3,500
Kitchen Wall Cabinet	10 LF	200.00			2,000
			0	0	18,100
07 30 00 INSULATION					
Ceiling Insulation	512 SF	2.00			1,024
1st Floor Insulation	512 SF	4.00			2,048
			0	0	3,073
07 50 00 ROOFING					
Wood Shingle Roofing Maintenance	1 LS	1,200.00		1,200	
New Long Term Wood Shingle Roofing	804 SF	8.00			6,431
Gutter	88 LF	35.00			3,069
Downspout	80 LF	25.00			2,000
			0	1,200	11,500
08 11 00 DOOR & FRAMES					
New Front Door/Frame/Hardware	1 EA	3,000.00			3,000
Interior Door/Frame/Hardware	6 EA	850.00			5,100
Interior Double Door/Frame/Hardware	2 PR	1,250.00			2,500
			0	0	10,600
08 52 00 WOOD WINDOWS					
Replica Basement Window	1 EA	850.00			850
			0	0	850

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS19 - 2 Story Brick House Option 2					
09 20 00 GYPSUM					
Gypsum Board on Wood Framed Wall	810 SF	2.50			2,025
Gypsum Board on Ceiling	807 SF	2.00			1,614
Additional Gypsum Board on 1st Floor Ceiling	403 SF	1.50			605
Plaster Restoration	1,972 SF	3.00			5,916
			0	0	10,160
09 95 00 WOOD FLOOR					
Refinish Wood Flooring	406 SF	4.00			1,624
New Wood Flooring	258 SF	8.00			2,061
			0	0	3,685
09 90 00 PAINTING					
Prep, Prime and Paint Interior Gyp	2,782 SF	1.25			3,478
Prep, Prime and Paint Interior Gyp Ceiling	807 SF	1.50			1,210
			0	0	4,688
10 28 00 TOILET AND BATH ACCESSORIES					
Soap Disp	2 EA	45.00			90
Mirror 1'11x5'	2 EA	250.00			500
Full Height Mirror	2 EA	600.00			1,200
TP Dispenser	2 EA	40.00			80
Grab Bars	4 EA	75.00			300
Grab Bars @ Shower Two Wall	2 EA	125.00			250
Shower Curtain/ Rod	2 EA	100.00			200
ADA Shower Seat	2 EA	150.00			300
Fire Extinguisher	3 EA	150.00			450
Fire Escape Ladder	1 EA	250.00			250
Window Treatment	15 EA	200.00			3,000
			0	0	6,620
21 00 00 FIRE SUPRESSION					
Sprinkler System	1,231 SF	5.00			6,155
Fire Pump	1 EA	15,000.00			15,000
			0	0	21,155
22 00 00 PLUMBING					
Water Closet	2 EA	2,900.00			5,800
Wall Hung Lavatory	2 EA	2,750.00			5,500
Kitchen Sink	1 EA	2,750.00			2,750
Shower/Tub	1 EA	2,400.00			2,400
Water Heater	1 EA	3,500.00			3,500
Floor Drain in Basement	1 EA	850.00			850
			0	0	20,800
23 00 00 HVAC					
HVAC System Heat Pump(2), DOAS	1,231 SF	25.00			30,777
Exhaust fan in RR	2 EA	250.00			500
			0	0	31,277
26 00 00 ELECTRICAL					
Site	1 LS	5,000.00			5,000
Generator	1 LS	35,000.00			35,000
Lighting	1,231 SF	9.00			11,080
Power	1,231 SF	2.00			2,462
Distribution	1,231 SF	6.00			7,387
Telephone	1 LS	250.00			250
Data (Wireless)	1 LS	300.00			300
Fire Alarm/Security	1,231 SF	3.00			3,693
			0	0	65,172
31 20 00 EARTH MOVING					
Spot Regrade	1 LS	500.00			500
			0	0	500
33 10 00 WATER DISTRIBUTION					
2" Ø PVC Water Line	200 LF	30.00			6,000
			0	0	6,000
33 30 00 SANITARY SEWERAGE					
6" Ø PVC Sanitary Sewer	150 LF	45.00			6,750
			0	0	6,750
33 51 00 NATURAL GAS DISTRIBUTION					
1" Ø Gas Line	200 LF	35.00			7,000
			0	0	7,000

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Cultural Landscape and Historic Structures Report - Bailly Homestead
Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION		Immediate	Short Term	Long Term
HS20 - 2 Story Log House				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		143	3,797	6,749
02 50 00 HAZARDOUS MATERIAL ABATEMENT		-	-	1,400
03 30 00 CAST-IN-PLACE CONCRETE		-	-	1,104
04 01 20 EXTERIOR RESTORATION AND CLEANING		752	22,762	-
06 13 00 ROUGH CARPENTRY		200	-	-
06 40 16 INTERIOR ARCHITECTURAL WOODWORK		-	-	3,500
07 50 00 ROOFING		-	1,200	-
08 11 00 DOOR & FRAMES		-	250	1,650
09 20 00 GYPSUM		-	-	400
09 95 00 WOOD FLOOR		-	-	1,920
09 90 00 PAINTING		-	450	2,050
10 28 00 TOILET AND BATH ACCESSORIES		-	-	1,710
11 40 00 FOOD SERVICE EQUIPMENT		-	-	1,500
21 00 00 FIRE SUPRESSION		-	-	2,000
22 00 00 PLUMBING		-	-	12,300
23 00 00 HVAC		-	-	4,666
26 00 00 ELECTRICAL		-	-	10,794
31 20 00 EARTH MOVING		-	650	-
subtotal		1,095	29,108	51,743
Contractor's Fee	8%	88	2,329	4,139
subtotal		1,182	31,437	55,883
Design/Estimate Contingency	15%	177	4,716	8,382
subtotal		1,359	36,153	64,265
Escalation to Mid-Point - 01/14/2020	5.1%	70	1,856	3,299
TOTAL		**1,429**	**38,008**	**67,564**

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DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS20 - 2 Story Log House					
02 50 00 HAZARDOUS MATERIAL ABATEMENT					
Lead Based Paint Abatement ALLOW	1 LS	1,400.00			1,400
			0	0	1,400
03 30 00 CAST-IN-PLACE CONCRETE					
Install Vapor barrier in Crawl Space and regrade if needed	138 SF	8.00			1,104
			0	0	1,104
04 01 20 EXTERIOR RESTORATION AND CLEANING					
Power wash or Media Blast Exterior	1,002 SF	2.00		2,005	
Install Wood Protectant	1,002 SF	3.00		3,007	
Install Insect Infestation Treatment	1,002 SF	0.75	752		
Log Repair/Fill Checks in Logs	1 LS	1,600.00		1,600	
Remove Daubing/Chinking and install New	1 LS	12,000.00		12,000	
Restore Window Sashes	6 EA	400.00		2,400	
Repair Wood Trim	1 LS	1,400.00		1,400	
Spot Repoint Brick	1 LS	350.00		350	
			752	22,762	0
06 13 00 ROUGH CARPENTRY					
Int Wood Framed Wall	80 SF	2.50	200		
			200	0	0
06 40 16 INTERIOR ARCHITECTURAL WOODWORK					
Install wood Guard Rail @ 2nd Floor	7 LF	100.00			700
Install wood Wall Rail @ 2nd Floor	12 LF	50.00			600
Kitchen Base Cabinet w/ Countertop	4 LF	350.00			1,400
Kitchen Wall Cabinet	4 LF	200.00			800
			0	0	3,500
07 50 00 ROOFING					
Wood Shingle Roofing Maintenance	1 LS	1,200.00		1,200	
			0	1,200	0
08 11 00 DOOR & FRAMES					
New Front Door Threshold and trim	1 LS	250.00		250	
New Front Door Hardware	1 LS	800.00			800
Interior Door/Frame/Hardware	1 EA	850.00			850
			0	250	1,650
09 20 00 GYPSUM					
Gypsum Board on Wood Framed Wall	160 SF	2.50			400
			0	0	400
09 95 00 WOOD FLOOR					
Refinish Wood Flooring	220 SF	4.00			880
Remove 1st Floor Wood Flooring and Reinstall	130 SF	8.00			1,040
			0	0	1,920
09 90 00 PAINTING					
Paint Interior Stair and Walls	1 LS	850.00			850
Prep, Prime and Paint Interior Gyp	160 SF	1.25			200
Paint Front Door	1 EA	150.00		150	
Paint/Repair 2n Floor Door	1 EA	300.00		300	
Paint interior of Windows	4 EA	150.00			600
Paint Bracketed Chimney Cabinet and Steel	1 LS	400.00			400
			0	450	2,050
10 28 00 TOILET AND BATH ACCESSORIES					
Soap Disp	1 EA	45.00			45
Mirror 1'11x5'	1 EA	250.00			250
Full Height Mirror	1 EA	600.00			600
TP Dispenser	1 EA	40.00			40
Grab Bars	2 EA	75.00			150
Grab Bars @ Shower Two Wall	1 EA	125.00			125
Shower Curtain/ Rod	1 EA	100.00			100
Fire Extinguisher	1 EA	150.00			150
Fire Escape Ladder	1 EA	250.00			250
			0	0	1,710
11 40 00 FOOD SERVICE EQUIPMENT					
Under Counter Refrigerator	1 EA	1,500.00			1,500
			0	0	1,500
21 00 00 FIRE SUPRESSION					
Sprinkler System	400 SF	5.00			2,000
			0	0	2,000

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS20 - 2 Story Log House					
22 00 00 PLUMBING					
Water Closet	1 EA	2,900.00			2,900
Wall Hung Lavatory	1 EA	2,750.00			2,750
Kitchen Sink	1 EA	2,750.00			2,750
Shower/Tub	1 EA	2,400.00			2,400
Water Heater	1 EA	1,500.00			1,500
			0	0	12,300
23 00 00 HVAC					
HVAC System Horizontal Heat Pump	276 SF	16.00			4,416
Exhaust fan in RR	1 EA	250.00			250
			0	0	4,666
26 00 00 ELECTRICAL					
Site	1 LS	5,000.00			5,000
Lighting	276 SF	8.00			2,208
Power	276 SF	2.00			552
Distribution	276 SF	6.00			1,656
Telephone	1 LS	250.00			250
Data (Wireless)	1 SF	300.00			300
Fire Alarm/Security	276 SF	3.00			828
			0	0	10,794
31 20 00 EARTH MOVING					
Site Cut/Fill Rough Grading	1 LS	650.00		650	
			0	650	0

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Cultural Landscape and Historic Structures Report - Bailly Homestead
Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION		Immediate	Short Term	Long Term
HS21 - Storehouse				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		-	-	4,006
02 50 00 HAZARDOUS MATERIAL ABATEMENT		-	-	500
04 01 20 EXTERIOR RESTORATION AND CLEANING		-	-	13,524
06 13 00 ROUGH CARPENTRY		-	-	800
07 50 00 ROOFING		-	-	2,456
10 28 00 TOILET AND BATH ACCESSORIES		-	-	150
26 00 00 ELECTRICAL		-	-	9,274
subtotal		-	-	30,710
Contractor's Fee	8%	-	-	2,457
subtotal		-	-	33,166
Design/Estimate Contingency	15%	-	-	4,975
subtotal		-	-	38,141
Escalation to Mid-Point - 01/14/2020	5.1%	-	-	1,958
TOTAL		**-**	**-**	**40,099**

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DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS21 - Storehouse					
02 50 00 HAZARDOUS MATERIAL ABATEMENT					
Long Term Abate Asbestos Roofing Underlayment	1 LS	500.00			500
			0	0	500
04 01 20 EXTERIOR RESTORATION AND CLEANING					
Power wash or Media Blast Exterior	504 SF	2.00			1,008
Install Wood Protectant	504 SF	3.00			1,512
Install Insect Infestation Treatment	504 SF	1.00			504
Log Repair/Fill Checks in Logs	1 LS	800.00			800
Remove Daubing/Chinking and install New	1 LS	8,500.00			8,500
Restore Window Sashes - Long Term	2 EA	400.00			800
Repair Wood Trim	1 LS	400.00			400
			0	0	13,524
06 13 00 ROUGH CARPENTRY					
Secure Roof Rafters& Repair Daubing	20 EA	40.00			800
			0	0	800
07 50 00 ROOFING					
New Long Term Wood Shingle Roofing	307 SF	8.00			2,456
			0	0	2,456
10 28 00 TOILET AND BATH ACCESSORIES					
Fire Extinguisher	1 EA	150.00			150
			0	0	150
26 00 00 ELECTRICAL					
Site	1 LS	5,000.00			5,000
Lighting	196 SF	8.00			1,568
Power	196 SF	2.00			392
Distribution	196 SF	6.00			1,176
Telephone	1 LS	250.00			250
Data (Wireless)	1 SF	300.00			300
Fire Alarm/Security	196 SF	3.00			588
			0	0	9,274

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Cultural Landscape and Historic Structures Report - Bailly Homestead
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DESCRIPTION		Immediate	Short Term	Long Term
HS22 - Chapel				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		203	3,874	7,112
02 41 00 DEMOLITION		-	-	800
02 50 00 HAZARDOUS MATERIAL ABATEMENT		-	-	1,900
04 01 20 EXTERIOR RESTORATION AND CLEANING		851	24,475	5,250
06 13 00 ROUGH CARPENTRY		500	-	2,030
06 40 16 INTERIOR ARCHITECTURAL WOODWORK		-	-	3,225
07 30 00 INSULATION		-	-	1,096
07 50 00 ROOFING		-	1,200	5,130
08 11 00 DOOR & FRAMES		-	-	800
09 20 00 GYPSUM		-	-	6,285
09 95 00 WOOD FLOOR		-	-	822
09 90 00 PAINTING		-	150	3,792
10 28 00 TOILET AND BATH ACCESSORIES		-	-	150
23 00 00 HVAC		-	-	4,109
26 00 00 ELECTRICAL		-	-	11,205
31 20 00 EARTH MOVING		-	-	400
32 13 13 CEMENT CONCRETE PAVING		-	-	420
subtotal		1,554	29,699	54,527
Contractor's Fee	8%	124	2,376	4,362
subtotal		1,678	32,075	58,889
Design/Estimate Contingency	15%	252	4,811	8,833
subtotal		1,930	36,886	67,722
Escalation to Mid-Point - 01/14/2020	5.1%	99	1,894	3,476
TOTAL		**2,029**	**38,780**	**71,199**

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DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS22 - Chapel					
02 41 00 DEMOLITION					
Selective Demolition Allowance	1 LS	800.00			800
			0	0	800
02 50 00 HAZARDOUS MATERIAL ABATEMENT					
Lead Based Paint Abatement ALLOW	1 LS	1,400.00			1,400
Long Term Abate Asbestos Roofing Underlayment	1 LS	500.00			500
			0	0	1,900
04 01 20 EXTERIOR RESTORATION AND CLEANING					
Power wash or Media Blast Exterior	1,135 SF	2.00		2,270	
Install Wood Protectant	1,135 SF	3.00		3,405	
Install Insect Infestation Treatment	1,135 SF	0.75	851		
Log Repair/Fill Checks in Logs	1 LS	1,600.00		1,600	
Remove Daubing/Chinking and install New	1 LS	12,000.00		12,000	
Restore Window Sashes	4 EA	400.00		1,600	
Restore Window Sashes - Long Term	2 EA	1,100.00			2,200
Wood Shingle Siding Maintenance	1 LS	1,200.00		1,200	
Repair Wood Trim	1 LS	1,400.00		1,400	
Install Pipes in Exterior for Ventilation	40 EA	25.00		1,000	
Enlarge Crawl Space Access w/ drain	1 LS	2,000.00			2,000
Reconstruct Foundation Vents	3 EA	350.00			1,050
			851	24,475	5,250
06 13 00 ROUGH CARPENTRY					
Secure Building from Rodent Infiltration	1 LS	500.00	500		
Repair and Supplement Floor Framing at Apse	1 LS	750.00			750
Install Posts in Crawl Space	2 EA	150.00			300
Install Structural Straps @ Purlins	34 EA	20.00			680
Secure Roof Rafters @ Apse	15 EA	20.00			300
			500	0	2,030
06 40 16 INTERIOR ARCHITECTURAL WOODWORK					
Interior Wood Base	75 LF	15.00			1,125
Interior Wood Chair Rail	75 LF	10.00			750
Interior Wood Trim @ Windows and Doors	5 EA	170.00			850
Restore Wood Trim @ Gothic Arch	1 LS	500.00			500
			0	0	3,225
07 30 00 INSULATION					
Crawl Space Insulation	274 SF	4.00			1,096
			0	0	1,096
07 50 00 ROOFING					
Wood Shingle Roofing Maintenance	1 LS	1,200.00		1,200	
New Long Term Wood Shingle Roofing	329 SF	8.00			2,630
Gutter	50 LF	35.00			1,750
Downspout	30 LF	25.00			750
			0	1,200	5,130
08 11 00 DOOR & FRAMES					
New Front Door Hardware	1 LS	800.00			800
			0	0	800
09 20 00 GYPSUM					
Furr Exterior and Install MR Gyp w/ Skim Coat	675 SF	8.50			5,738
Gypsum Board on Ceiling	274 SF	2.00			548
			0	0	6,285
09 95 00 WOOD FLOOR					
Paint Wood Flooring	274 SF	3.00			822
			0	0	822
09 90 00 PAINTING					
Install Encapsulate on Log Walls	1,015 SF	2.50			2,538
Prep, Prime and Paint Interior Gyp	675 SF	1.25			844
Prep, Prime and Paint Interior Gyp Ceiling	274 SF	1.50			411
Paint Front Door	1 EA	150.00		150	
			0	150	3,792
10 28 00 TOILET AND BATH ACCESSORIES					
Fire Extinguisher	1 EA	150.00			150
			0	0	150
23 00 00 HVAC					
HVAC System Horizontal Heat Pump/Decorative Grilles	274 SF	15.00			4,109
			0	0	4,109

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
HS22 - Chapel					
26 00 00 ELECTRICAL					
Site	1 LS	5,000.00			5,000
Lighting	274 SF	8.00			2,192
Install Pair of Replica Lights @ Gothic Arch	1 PR	450.00			450
Power	274 SF	2.00			548
Distribution	274 SF	6.00			1,644
Telephone	1 LS	250.00			250
Data (Wireless)	1 SF	300.00			300
Fire Alarm/Security	274 SF	3.00			822
			0	0	11,205
31 20 00 EARTH MOVING					
Site Cut/Fill Rough Grading	1 LS	400.00			400
			0	0	400
32 13 13 CEMENT CONCRETE PAVING					
Demo Step and Install New Concrete Landing	30 SF	14.00			420
			0	0	420

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Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION		Immediate	Short Term	Long Term
ADA Overnight Accommodations				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		-	-	19,683
03 30 00 CAST-IN-PLACE CONCRETE		-	-	12,600
06 13 00 ROUGH CARPENTRY		-	-	24,492
06 40 16 INTERIOR ARCHITECTURAL WOODWORK		-	-	5,593
07 30 00 INSULATION		-	-	3,384
07 50 00 ROOFING		-	-	7,030
08 11 00 DOOR & FRAMES		-	-	5,550
08 52 00 WOOD WINDOWS		-	-	2,025
09 20 00 GYPSUM		-	-	3,501
09 30 00 TILE		-	-	3,018
09 95 00 WOOD FLOOR		-	-	3,548
09 90 00 PAINTING		-	-	6,568
10 28 00 TOILET AND BATH ACCESSORIES		-	-	1,585
11 40 00 FOOD SERVICE EQUIPMENT		-	-	1,500
21 00 00 FIRE SUPRESSION		-	-	1,875
22 00 00 PLUMBING		-	-	17,000
23 00 00 HVAC		-	-	5,625
26 00 00 ELECTRICAL		-	-	11,175
31 20 00 EARTH MOVING		-	-	2,921
31 31 00 TERMITE CONTROL		-	-	281
32 13 13 CEMENT CONCRETE PAVING		-	-	1,200
32 93 00 EXTERIOR PLANTS		-	-	2,500
33 10 00 WATER DISTRIBUTION		-	-	2,250
33 30 00 SANITARY SEWERAGE		-	-	3,375
33 51 00 NATURAL GAS DISTRIBUTION		-	-	2,625
subtotal		-	-	150,903
Contractor's Fee	8%	-	-	12,072
subtotal		-	-	162,976
Design/Estimate Contingency	15%	-	-	24,446
subtotal		-	-	187,422
Escalation to Mid-Point - 01/14/2020	5.1%	-	-	9,621
TOTAL		**-**	**-**	**197,043**

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DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
ADA Overnight Accommodations					
03 30 00 CAST-IN-PLACE CONCRETE					
Perimeter Foundation	84 LF	150.00			12,600
			0	0	12,600
06 13 00 ROUGH CARPENTRY					
Wood Floor Structure/Deck	375 SF	17.00			6,375
Roof Wood Truss/Deck	590 SF	13.00			7,669
Canopy w/ Brackets Structure	30 SF	35.00			1,050
Exterior Wood Framed Walls	756 SF	2.50			1,890
Interior Wood Framed Walls	310 SF	2.00			620
T&G Wood Soffit	168 SF	5.00			840
Board and Batten Siding	756 SF	8.00			6,048
			0	0	24,492
06 40 16 INTERIOR ARCHITECTURAL WOODWORK					
Interior Wood Base	153 LF	15.00			2,293
Kitchen Base Cabinet w/ Countertop	6 LF	350.00			2,100
Kitchen Wall Cabinet	6 LF	200.00			1,200
			0	0	5,593
07 30 00 INSULATION					
Ceiling Insulation	375 SF	2.00			750
Crawl Space Insulation	375 SF	4.00			1,500
Exterior Wall Insulation	756 SF	1.50			1,134
			0	0	3,384
07 50 00 ROOFING					
Wood Shingle Roofing	620 SF	6.50			4,030
Flashing	84 LF	15.00			1,260
Gutter	50 LF	25.00			1,250
Downspout	14 IF	35.00			490
			0	0	7,030
08 11 00 DOOR & FRAMES					
Entry Door/Frame/Hardware	1 EA	1,750.00			1,750
Exterior Mechanical Closet Entry Door/Frame/Hardware	1 EA	1,250.00			1,250
Interior Door/Frame/Hardware	3 EA	850.00			2,550
			0	0	5,550
08 52 00 WOOD WINDOWS					
Wood Window	3 EA	675.00			2,025
			0	0	2,025
09 20 00 GYPSUM					
Gypsum Board on Walls	1,376 SF	2.00			2,751
Gypsum Board on Ceiling	375 SF	2.00			750
			0	0	3,501
09 30 00 TILE					
Tile @ RR Floor	79 SF	15.00			1,190
Tile @ RR Walls	183 SF	10.00			1,827
			0	0	3,018
09 95 00 WOOD FLOOR					
Wood Flooring	296 SF	12.00			3,548
			0	0	3,548
09 90 00 PAINTING					
Prep, Prime and Paint Exterior Siding/Soffit	924 SF	3.00			2,772
Prep, Prime and Paint Interior Gyp	1,376 SF	1.25			1,720
Prep, Prime and Paint Interior Gyp Ceiling	375 SF	1.50			563
Paint Door/Frame	5 EA	150.00			750
Paint Wood Base	153 LF	5.00			764
			0	0	6,568
10 28 00 TOILET AND BATH ACCESSORIES					
Soap Disp	1 EA	45.00			45
Mirror 1'11x5'	1 EA	250.00			250
Full Height Mirror	1 EA	600.00			600
TP Dispenser	1 EA	40.00			40
Grab Bars	2 EA	75.00			150
Grab Bars @ Shower Two Wall	2 EA	125.00			250
Shower Curtain/ Rod	1 EA	100.00			100
ADA Shower Seat	1 EA	150.00			150
			0	0	1,585

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
ADA Overnight Accommodations					
11 40 00 FOOD SERVICE EQUIPMENT					
Under Counter Refrigerator	1 EA	1,500.00			1,500
			0	0	1,500
21 00 00 FIRE SUPRESSION					
Sprinkler System	375 SF	5.00			1,875
			0	0	1,875
22 00 00 PLUMBING					
Water Closet	1 EA	2,900.00			2,900
Wall Hung Lavatory	1 EA	2,750.00			2,750
Kitchen Sink	1 EA	2,750.00			2,750
Shower	1 EA	2,400.00			2,400
Water Heater	1 EA	1,500.00			1,500
Floor Drain	2 EA	850.00			1,700
Diaper Changing Station	1 EA	1,500.00			1,500
Water Heater	1 EA	1,500.00			1,500
			0	0	17,000
23 00 00 HVAC					
HVAC System	375 SF	15.00			5,625
			0	0	5,625
26 00 00 ELECTRICAL					
Site	1 LS	5,000.00			5,000
Lighting	375 SF	6.00			2,250
Power	375 SF	2.00			750
Distribution	375 SF	4.00			1,500
Telephone	1 LS	250.00			250
Data (Wireless)	1 SF	300.00			300
Fire Alarm/Security	375 SF	3.00			1,125
			0	0	11,175
31 20 00 EARTH MOVING					
Clear Site	1 LS	500.00			500
Site Cut/Fill Rough Grading	26 CY	25.00			662
Grade Sidewalks	150 SF	0.15			23
Grade Building	375 SF	0.50			188
Foundation Excavation	25 CY	12.00			299
Finish Grade Site	1 LS	750.00			750
Temporary Erosion Control	1 LS	500.00			500
			0	0	2,921
31 31 00 TERMITE CONTROL					
Building	375 SF	0.75			281
			0	0	281
32 13 13 CEMENT CONCRETE PAVING					
Sidewalk	150 SF	8.00			1,200
			0	0	1,200
32 93 00 EXTERIOR PLANTS					
Misc Landscaping	1 LS	2,500.00			2,500
			0	0	2,500
33 10 00 WATER DISTRIBUTION					
2" Ø PVC Water Line	75 LF	30.00			2,250
			0	0	2,250
33 30 00 SANITARY SEWERAGE					
6" Ø PVC Sanitary Sewer	75 LF	45.00			3,375
			0	0	3,375
33 51 00 NATURAL GAS DISTRIBUTION					
1" Ø Gas Line	75 LF	35.00			2,625
			0	0	2,625

CONSTRUCTION MANAGEMENT RESOURCES, LLC
ESTIMATING • SCHEDULING • PROJECT MANAGEMENT • CONSULTING
5201 JOHNSON DRIVE, SUITE 330, MISSION, KANSAS 66205 (913) 262-6715 • FAX (913) 262-1380

Cultural Landscape and Historic Structures Report - Bailly Homestead
Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION		Immediate	Short Term	Long Term
Landscape				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		7,958	-	63,147
32 93 00 EXTERIOR PLANTS		53,050	-	420,977
subtotal		61,008	-	484,123
Contractor's Fee	8%	4,881	-	38,730
subtotal		65,888	-	522,853
Design/Estimate Contingency	15%	9,883	-	78,428
subtotal		75,771	-	601,281
Escalation to Mid-Point - 01/14/2020	5.1%	3,890	-	30,866
TOTAL		**79,661**	**-**	**632,147**

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DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
Landscape					
32 93 00 EXTERIOR PLANTS					
PT1					0
Remove Dead Trees	5 EA	500.00	2,500		
Prune Tree	1 EA	350.00	350		
PT2					0
Regrade Entry Drive and banks	4,350 SF	8.00	34,800		
Chip and Seal Paving	2,175 SF	2.00	4,350		
Plant New Trees	17 EA	650.00	11,050		
LT1.1					0
Regrade Entry Drive and banks	6,450 SF	8.00			51,600
Chip and Seal Paving	2,175 SF	2.00			4,350
Plant New Trees	12 EA	650.00			7,800
LT1.2					
Construct Brick Walk	183 SF	15.00			2,745
Wood Boardwalk with railing	52 SF	20.00			1,040
LT1.3					
Add Raised Beds	480 SF	15.00			7,200
LT1.4					
Arcing Sidewalk	201 SF	10.00			2,010
Arcing Light Aggregate Sidewalk	165 SF	8.00			1,320
LT1.5					
Light Aggregate Sidewalk	114 SF	8.00			912
LT1.6					
Construct Dark Aggregate Walk	192 SF	8.00			1,536
LT1.7					
Stabilize and repair concrete block planters	137 SF	15.00			2,050
Replace Block Retaining Walls	161 SF	45.00			7,263
Replace Concrete paving	1,023 SF	12.00			12,271
LT1.8					
Install patio (crushed limestone and solid concrete pavers)	247 SF	15.00			3,705
LT1.9					
Construct Dark Aggregate Walk	110 SF	8.00			880
LT1.10					
Plant Deciduous Trees	1 EA	750.00			750
Plant Apple Tree	1 EA	1,250.00			1,250
Install Planting Beds	230 SF	45.00			10,350
Lilac Shrub	1 EA	100.00			100
Bridal Veil Spirea Shrubs	2 EA	125.00			250
Plant Hosta and other perennial in Planting Beds	150 SF	45.00			6,750
Beds of Day Lilies	70 SF	35.00			2,450
Plant Grape Hyacinth Bulbs	120 SF	25.00			3,000
Winterberry Shrub	2 EA	100.00			200
LT1.11					
Install Planting Beds	40 SF	65.00			2,600
Lilac Shrub	2 EA	100.00			200
Plant Elm	1 EA	850.00			850
LT1.12					
Remove OH Light and Install New	2 EA	3,500.00			7,000
Relocate Light @ Howe and Entry	1 EA	1,500.00			1,500
LT1.13					
Pavement Marker for Non-Extant Windmill	132 SF	15.00			1,984
LT1.14					
Add Electric Box for power for events	1 LS	10,500.00			10,500
LT1.15					
Construct Dark Aggregate Walk	825 SF	8.00			6,600
LT1.16					
Periodic Monitoring of Elevations and Distances between Buildings'	By NPS				0
LT1.17					
Monitor tree canopy by certified arborist	By NPS				0
LT2.1					
Plant Oak Tree	1 EA	850.00			850
Plant Hazelnut Shrubs	2 EA	125.00			250
LT2.2					
Crushed Fines of limestone for Parking	144 SF	12.00			1,728
LT2.3					
Relocate NHL Plaque	1 EA	5,000.00			5,000
LT2.4					
Add Water Hydrant	costs in site utilities				0
LT2.5					
Monitor tree canopy by certified arborist	By NPS				0
LT3.1					
Install Shrub Beds	1,040 SF	10.00			10,400
LT3.2					
Add ADA Building	see ADA Estimate				0
LT3.3					
Install Shrub Beds	256 SF	10.00			2,562
LT3.4					
Regrade Access Drive and banks	3,450 SF	8.00			27,600
LT3.5					
Crushed Fines of limestone for Parking	342 SF	12.00			4,104
LT3.6					
Compacted Earth Trail	2,310 SF	8.00			18,480
Compacted Earth Trail for Driving	9,360 SF	8.00			74,880
LT3.7					
Comfort Station ALLOW	200 SF	400.00			80,000
LT3.8					
New OH Light	1 EA	3,500.00			3,500
LT3.9					
Screen Plantings	4,280 SF	3.00			12,840
LT3.10					
Plant Fruit Trees	8 EA	850.00			6,800
LT3.11					
Crushed Fines of limestone for Path	264 SF	12.00			3,168
Picnic tables	3 EA	850.00			2,550
LT3.12					
Monitor tree canopy by certified arborist	By NPS				0
Repair Tree Canopy	650 SF	5.00			3,250
			53,050	0	420,977

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Cultural Landscape and Historic Structures Report - Bailly Homestead
Indiana Dunes National Lakeshore
STRATA Architecture Inc
Final Estimate 05/07/2018

DESCRIPTION		Immediate	Short Term	Long Term
Site Utilities				
01 00 00 GENERAL CONDITIONS (assume stand alone project)		-	-	50,361
26 00 00 ELECTRICAL		-	-	31,000
33 10 00 WATER DISTRIBUTION		-	-	166,743
33 30 00 SANITARY SEWERAGE		-	-	124,000
33 51 00 NATURAL GAS DISTRIBUTION		-	-	14,000
subtotal		-	-	386,104
Contractor's Fee	8%	-	-	30,888
subtotal		-	-	416,992
Design/Estimate Contingency	15%	-	-	62,549
subtotal		-	-	479,541
Escalation to Mid-Point - 01/14/2020	5.1%	-	-	24,617
TOTAL		**-**	**-**	**504,158**

DESCRIPTION	QUANTITY	UNIT $	Immediate	Short Term	Long Term
Site Utilities					
26 00 00 ELECTRICAL					
New Electrical Service 400amp UG	200 LF	35.00			7,000
New Telecom	200 LF	15.00			3,000
New Cable	200 LF	15.00			3,000
Demo Existing Site Light	in landscaping				0
New Site Lighting	in landscaping				0
New Pedestrian Lighting	12 EA	1,500.00			18,000
Power Pole for events	in landscaping				0
			0	0	31,000
33 10 00 WATER DISTRIBUTION					
12" Ø PVC Water Line	1,100 LF	95.00			104,500
4" Ø PVC Water Line	400 LF	45.00			18,000
2" Ø PVC Water Line	671 LF	35.00			23,493
Backflow Preventer	2 EA	1,500.00			3,000
Fire Pump	1 EA	8,500.00			8,500
Booster Pump	1 EA	4,500.00			4,500
Water Meter	1 EA	750.00			750
Connect to Existing @ Howe and Good Fellow	1 EA	1,500.00			1,500
New Fire Hydrant	1 EA	2,500.00			2,500
			0	0	166,743
33 30 00 SANITARY SEWERAGE					
6" Ø PVC Sanitary Sewer	1,500 LF	65.00			97,500
Lift Station	1 EA	25,000.00			25,000
Connect to Existing @ Howe and Good Fellow	1 EA	1,500.00			1,500
			0	0	124,000
33 51 00 NATURAL GAS DISTRIBUTION					
1" Ø Gas Line	400 LF	35.00			14,000
Gas Meter	by utility co				0
			0	0	14,000