Paul Laurence Dunbar House
CULTURAL LANDSCAPE & HISTORIC STRUCTURES REPORT
VOLUME 2
DAYTON AVIATION HERITAGE NATIONAL HISTORICAL PARK
DAYTON, OHIO

SEPTEMBER 12, 2019
NPS PMIS # 38797
Cover Photo:
Paul Laurence Dunbar House, view looking northwest. 2018 (STRATA)
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INTRODUCTION
Chapter 5 | Treatment Recommendations Introduction

Summary
The Paul Laurence Dunbar House is located at 219 N. Paul Laurence Dunbar Street (formerly N. Summit) in Dayton, Ohio. The two-story brick house was built in 1887-1888 and went through several owners until it was purchased by Matilda Dunbar in 1904. Paul Laurence Dunbar, generally recognized as the first African American to become widely known for literary accomplishments, and his mother, Matilda, moved into the house in 1904. Paul died of complications of tuberculosis in 1906. Matilda continued to live in the house until her death in 1934, having kept many of Paul’s personal effects and his Library (or “Loafing Holt,” as Dunbar had affectionately named it), intact in honor of his memory.

The State of Ohio purchased the house in 1936 and continues to offer a significant example of public stewardship of an African American historic site. The Paul Laurence Dunbar State Memorial was the first state memorial dedicated to an African American, and it is believed to be the first publicly-owned house museum to honor an African American in the entire country. The property is the first National Historic Landmark to be established in honor of an African American. The Paul Laurence Dunbar State Memorial has been open to the public since 1938. The historic site is the heart of the National Register-listed Dunbar Historic District and is a great source of community pride.

This chapter provides information regarding the final historic treatment approach for the Dunbar House, Barn, and Cultural Landscape. The recommendations seek to preserve the historic character of the National Landmark property while providing for maintenance, life safety upgrades, accessibility modifications, and continued historical interpretation throughout the site.
The Historic Treatment goals include:

- Provide a pathway for continued preservation of the Dunbar House and Barn.
- Provide design philosophy, alternatives, and recommendations for the appropriate treatment of the structures and historic landscape.
- Include accessibility recommendations across the site and to and within the Dunbar House. Address the impacts on building historic integrity for alternatives.
- Address life safety code recommendations.
- Determine the impacts of treatment recommendation alternatives and uses on House and Barn historic integrity and appearance.
- Provide a range of appropriate alternatives for enhancing landscape character in support of visitor amenity and interpretive programs. Provide a prioritized list of work orders needed to implement the approved treatment.

Treatment recommendations must balance the protection of the historic resources (landscape and structures) while supporting interpretation and compatible use of the site.

This chapter begins with a discussion of the administrative agreements and interpretive opportunities that have been developed for the Dunbar property. This is followed by an explanation of the selection of Rehabilitation as the most appropriate treatment approach for the cultural landscape, with a zonal application of restoration and rehabilitation across the Dunbar property. Rehabilitation was also selected as the most appropriate treatment approach for the House, and Barn.

Recommendations for the treatment of the Dunbar State Memorial landscape and structures should support the mission statement for the Dayton Aviation Heritage National Park and support the interpretive opportunities identified through the Foundation Document and the Long Range Interpretive Plan.

Recommendations for landscape treatment are provided in Chapter 6. Recommendations for accessibility, the Dunbar House, and the Dunbar Barn are presented in Chapter 7.

**Administrative Agreements and Interpretive Opportunities**

Agreements and interpretive opportunities have been enacted and identified for the Paul Laurence Dunbar State Memorial. The Cooperative Agreement between the NPS and Dayton History is to support the preservation, development, operation, use, and interpretation at several sites owned or managed by Dayton History, including the Paul Laurence Dunbar State Memorial.

The 2017 *Foundation Document, Dayton Aviation Heritage National Historical Park* was compiled to, “integrate and coordinate all kinds and levels of planning from a single, shared
understanding of what is most important about the [Dayton Aviation Heritage National Historical Park (DAAV)].\textsuperscript{360}

The NPS identified mission for the Dunbar State Memorial in the 2017 Foundation Document:  
*The National Park Service and its partners at Dayton Aviation Heritage National Historical Park interpret the lives and creations of Wilbur and Orville Wright and Paul Laurence Dunbar and preserve sites in the Dayton region associated with them as well as the early development of aviation.*\textsuperscript{361}

The Dunbar House, as part of the larger Dunbar Historic District, is noted as a fundamental resource within the park, as his residence from 1904 to 1906 and his mother’s place of residence until her death in 1934. The collections installed in the house and its adjacent museum are also integral parts of this resource.\textsuperscript{362}

The Paul Laurence Dunbar State Memorial is significant within DAAV as the last home of the internationally renowned poet, because it represents the level of success he attained from his writing career. Dunbar is important to American history because his success took place in an era of increasing racial segregation. The home was the first publicly administered site in Ohio (and very likely the United States) to commemorate an African American.\textsuperscript{363}

Interpretive themes outlined in the Foundation Document with regards to Paul Laurence Dunbar include:
- Raised by a single mom, Paul Laurence Dunbar overcame multiple obstacles – poverty, race, and poor health – to become a leader in literature and lay the foundation for future writers, inspiring the Harlem Renaissance. By the time of his death at the age of 33, Dunbar had risen socially and economically to a point aspired to by many Americans through the success of his writing.
- Through the foresight of Dunbar’s mother, Matilda, and the progressive ideology of Ohio’s political structure in the 1930s, preservation of the Dunbar house became the first site saved to honor the legacy of an African American – more than 20 years before the modern U.S. Civil Rights movement caught a tailwind.

The Foundation Document states that “The Ohio History Connection owns the artifacts exhibited in the house. Artifacts are generally in good condition, though threatened by ultraviolet light.” It further notes threats to the resource includes, “Environmental conditions for the exhibited collections are generally good, but some pieces already have extensive damage

from light. Neighborhood deterioration – known drug houses are on the same street as the Dunbar house. This poses a safety risk and can deter visitation."

The Document recommends opportunities to strengthen partnerships with the NPS, Dayton History, and the Ohio History Connection to combine efforts to develop new interpretive initiatives and realize the opportunity to educate visitors about the Dunbar neighborhood. 364

The Foundation Document recommends production of a Historic Structures Report and Cultural Landscape Report, which is being accomplished by the production of this report. NPS Policy-level Guidance that applies to the management, interpretation, and treatment of this resource include:

- Director’s Order 24: NPS Museum Collections Management.
- Director’s Order 28: Cultural Resource Management.
- Director’s Order 28A: Archeology.
- NPS Museum Handbook, parts 1, II, and III
- NPS Management Policies 2006 (4.1.4) “Partnerships.”
- The Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation.

The Long Range Interpretive Plan (LRIP) draft from 2018 was reviewed with consideration for its recommendations for the Dunbar House. The goal of the LRIP was to define and articulate the overall vision and long-term interpretive goals of the park (Dayton Aviation Heritage National Historical Park).

Significance:
The LRIP recognizes that the Dunbar House is significant because it is ‘the last home of internationally renowned poet Paul Laurence Dunbar, a residence that represents the level of success he attained from his writing career, which took place in an era of increasing racial segregation. The home was the first state-owned memorial to commemorate an African American.” 365

Interpretive Themes Identified in the LRIP:
- Raised by a single mother who was formerly enslaved, Paul Laurence Dunbar overcame multiple obstacles—poverty, racism, poor health, and personal challenges—to become a leader in literature and to lay the foundation for the success of others, inspiring artists and writers during the Harlem Renaissance. By the time of his death at the age of 33, Dunbar had risen socially and economically through the success of his writings to a place aspired to by many Americans.

• In 1936, the state of Ohio purchased the Dunbar house, establishing the nation’s first state-owned African American historical site, a landmark in diversifying the nation’s collective memory. This political act validated decades of work by Dunbar’s mother Matilda Dunbar and Dayton’s citizens to preserve and share Dunbar’s life and legacy.

Potential Target Audiences:
• School groups learning about local history
• School groups visiting Dunbar venues
• School groups with an art/writing/literature focus
• Dunbar tourists from out of town
• Local/neighborhood constituency

Recommendations:
Most of the LRIP recommendations centered around building relationships and growing interpretive opportunities. Recommendations centered on the Dunbar property and house include:

• **Recommendation.** Dunbar’s story is well told in the Wright-Dunbar Interpretive Center, and at the Paul Laurence Dunbar Historic Site and Visitor Center. *The Dunbar Home Visitor Center is in need of an exhibit upgrade.*
  o In addition to permanent exhibits that address Dunbar’s life story, *set aside a small space for community-curated exhibits* on topics related to Dunbar and other aspects of African American life.
  o *Consider hosting traveling exhibits* developed by other institutions and seek out places named in Dunbar’s honor to form new partnerships and seek out new audiences.

• **Recommendation.** To counter the impression of some that the site is no longer open, *post a large, bold sign outside the front of the visitor center and/or at the Third Street intersection* announcing the site is open.

• **Recommendation.** *Continue to enhance and maintain* the home, visitor center and landscaping at the site.

• **Recommendation.** There is an opportunity for the Dunbar house to contribute to enhancing knowledge and education not only about Dunbar himself, but about the contributions of other African American artists, writers, and scholars. Modeled on the Langston Hughes Community Library and Cultural Center, a branch of the Queens Library in Queens, New York [http://www.libraryactioncommittee.org/](http://www.libraryactioncommittee.org/), the center could *offer cultural arts programs and writing workshops*

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**Save America’s Treasures Grant Program - 1999-2001 Agreement**

In 1999, the Ohio Historical Society accepted a grant from the Historic Preservation Fund for the Save America’s Treasures Grant Program, National Park Service, Department of the Interior, for repairs to the house and barn. As a condition for accepting this grant, the Ohio Historical Society agreed to continued maintenance, repair and administration of the property in a manner
satisfactory to the Secretary of the Interior. Maintenance requirements of Section 102(a)(5) of
the National Historic Preservation Act in accordance with Chapter 6 Section M.2.c. of the
*Historic Preservation Fund Grants Manual*.\(^\text{366}\)

\(^{366}\) Save America’s Treasures Grant Program, Grant Agreement No. 39-99-ML-9914, 1999.
Rehabilitation Treatment Approach for Landscape and Buildings

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

Treatment recommendations for the Paul Laurence Dunbar landscape and structures are founded upon Federal standards and guidelines. In particular, guidance for the 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 the *National Park Service Director’s Orders 28: Cultural Resources Management Guidelines*.367 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*.368

For buildings and landscape, the SOI defines four approaches to treatment, including Preservation, Restoration, Rehabilitation, and Reconstruction.369 This section describes the basic concept for each approach then explains the appropriateness of that approach for guiding the future treatment of the Dunbar landscape, House, and Barn.

**Preservation**

Preservation includes applying measures to sustain the existing form, integrity, and materials of the contributing features of a historic property. This baseline approach focuses on stabilizing and protecting extant historic resources, rather than replacing missing elements. It is appropriate when a historic property is intact and does not require extensive repair or replacement and when continuing or new use does not require additions or alterations. Depiction at one particular period of time is not appropriate under this approach.370

Although Preservation is an appropriate approach for the treatment of the Dunbar landscape and structures, preservation does not support the park’s goals to improve accessibility and to enhance interpretation.

**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

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369 Grimmer, 2-3; and Birnbaum and Peters, 3-5.

370 Birnbaum and Peters, 17-18.
depiction at one particular period of time is not required; repair or replacement of deteriorated features is necessary; and alterations or additions are needed for a new use.\textsuperscript{371}

Rehabilitation is most appropriate for this cultural landscape and the House and Barn, as it provides for protection of contributing features while allowing for changes to support recommended landscape improvement, site accessibility, and further site interpretation. Rehabilitation of Dunbar landscape will enhance the ability of the site to recapture the historic character of Dunbar’s home by rehabilitating the site landscape to protect historic resources, improving site accessibility, increasing programmatic opportunities, and restoring historic character to the 1904 to 1906 period for interpretation of the historic landscape.

Rehabilitation of the home is recommended with an emphasis on the preservation of extant features that contribute to the historic significance of the building. These would include building fabric associated with the period of significance, 1904 to 1936. Treatment recommendations would aim to support the aspects of the landscape and buildings that remain from the period of significance. However, the changes required to address the need for increased visitor accessibility, addressing life safety measures, providing continued maintenance, and providing continued visitor services and interpretation is paramount.

Items or materials that were installed outside of the period of significance should not automatically be removed. Several major campaigns of rehabilitation efforts and smaller maintenance and repair projects have taken place throughout the Dunbar House and site since the state took ownership of the property. It is recommended to closely review all remaining materials to ensure they are correctly identified to ensure their origin and potential significance during future rehabilitation, maintenance, and repair projects.

**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.\textsuperscript{372}

Restoration is not the most appropriate management approach for the Dunbar landscape or for the historic structures. The period of significance is 1904-1936. Very little documentation exists of many critical historical elements, including the outbuilding/privy, sidewalks, barn use, house interiors, and portions of the yard. Providing accessibility and life safety measures throughout the site and buildings for visitors and interpretation are more important to the site than providing a pure restoration.

\textsuperscript{371} Birnbaum and Peters, 47-48.
\textsuperscript{372} Birnbaum and Peters, 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.\(^{373}\)

Reconstruction is not the most appropriate management approach for the Dunbar landscape, as the period of significance spans a broad period of time for the site and little documentation exists of missing features.

\(^{373}\) Birnbaum and Peters, 127-129.
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6 LANDSCAPE TREATMENT RECOMMENDATIONS
Chapter 6 | Landscape Treatment Recommendations

Introduction
This chapter includes the recommended landscape treatment for the Paul Laurence Dunbar House Historic Site (Dunbar House). The recommendations seek to recapture the historic character of Dunbar’s home by rehabilitating the site landscape to protect historic resources, improve site accessibility, increase programmatic opportunities, and facilitate interpretation of the 1904 to 1906 landscape.

The Landscape Treatment Plan provides guidance for the rehabilitation of the front, side, and back yards through preservation of extant landscape features and the addition of compatible elements to support future use. This chapter defines terminology used in the discussion of landscape treatment and presents recommendations organized according to landscape characteristic.

Recommendations for implementation of the landscape treatment are provided as prioritized lists of projects. Recommendations for the treatment of buildings are provided in Chapter 7. Costs for all recommendations are provided in Appendix G.

Landscape Treatment Plan
This landscape treatment plan provides guidance for the rehabilitation of the Dunbar House landscape. It describes the desired future conditions of the landscape but does not provide construction-level details necessary for construction.

The CLHSR applies the overall treatment approach of Rehabilitation to the cultural landscape. Rehabilitation of the Dunbar property would convey historic landscape character to visitors and evoke the landscape during the residency of Paul Dunbar and his mother Matilda Dunbar. The presence of non-compatible features, particularly vegetation and absence of historic fabric, currently obscure an understanding of the historic landscape and its relationship to the house. Historic documentation of the front and side yards supports the recapture of period vegetation and small-scale elements where possible. The backyard of the property presents a larger degree of landscape change including the addition of the Visitor Center. The introduction of new, compatible circulation features throughout the property is proposed for enabling all visitors to enjoy a barrier-free experience. Limited interventions are proposed for the landscape surrounding the Visitor Center to improve barrier-free access to the overall property (Figure 6.1).

The overall intent of the landscape treatment is to preserve contributing landscape features, rehabilitate selected aspects of the cultural landscape to better represent landscape character at the end of Paul Dunbar’s life, improve site accessibility, and increase outdoor programming opportunities. Landscape treatment recommendations are referenced by location on Site Treatment Drawing T1 and Vegetation Treatment Drawing T2.
Figure 6.1. Dunbar landscape rehabilitation treatment zone and the area of intervention for accessibility at the Visitor Center. (QEA)
Landscape Treatment Terminology
The following terminology is used to describe recommended treatment actions for the cultural landscape of the Dunbar House.374

*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 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.

*Maintain* refers to measures that sustain the form, integrity, and materials of features, either on a regular basis or as a non-recurring event.

*Modify* refers to a minor or partial change to a feature or landscape to allow for a new use while maintaining, its historical, cultural, or architectural character and/or contributing features.

*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.

**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 (or a portion of a property) as it appeared during a particular period by means of the removal of features from other periods in history and reconstruction of missing features from the restoration period.

**Landscape Treatment Tasks**

Recommended landscape treatment tasks are organized by landscape characteristic. The tasks focus on preservation of extant historic features, rehabilitate features to enhance historic character, and improve access to support the future use of the site.

Interpretation of missing historic features is proposed by the use of materials that are compatible with but differentiated from historic and contemporary, non-historic features. For example, new paths in historic locations are paved with light colored aggregate concrete while dark colored aggregate concrete identifies the surface of new paths in locations where paths did not historically exist. Known historic plantings such as shrubs in the side yard are replaced in kind or in the character of historic plant materials.

Landscape treatment tasks are coded by landscape characteristic and number on CLR Treatment Recommendations Drawings T1 and T2.

Treatment recommendations for spatial organization, land use, views, and topography emphasize preservation of contributing patterns. Specific treatment tasks associated with these landscape characteristics are directly related to and included in the description of treatment tasks for the characteristics of vegetation, circulation, buildings and structures, and small scale features.
Spatial Organization and Land Use

S.1 Preserve contributing spatial pattern of the open side yard by prohibiting the placement of landscape features such as trees, structures, and signs that do not support historic landscape character.

Views

W.1 Protect contributing view from N. Paul Laurence Dunbar Street to the side yard and front porch of the Dunbar House by relocating signage and removing incompatible vegetation. (See V.2 and F.5).

Topography

L.1 Preserve contributing topography of sloped front yard.

L.2 Repair modified steep slope along south property line.
   a. Add fill to regrade 725 sf of steep slope to grade of 1:3 for greater maintainability.
   b. Repair disturbed area by reseeding with turf grass.
   c. Monitor subsidence related to the past removal of trees.

Vegetation

V.1 Preserve vegetation that contributes to the historic character of the Dunbar property.
   b. Preserve and maintain Ohio buckeye (Aesculus glabra) tree at side yard.
      i. Monitor by certified arborist for pruning/treatment on a regular basis. Remove if the tree has defects with the potential to fall on the barn or proposed barn entrance walk.
      ii. The tree derives from the offspring of a Dunbar-era tree and is the oldest tree on the property. Consider partnership opportunities with local nurseries to propagate the tree through seeds.
      iii. Replace tree in kind if removed.
   c. Preserve and maintain common hackberry (Celtis occidentalis) sprout from root collar of stump at side yard.
      i. Consult certified arborist for recommendations.
      ii. Selectively prune sprouts to select most viable sprout to grow into tree.
   d. Preserve and maintain grape (Vitis labrusca) vine on wood pergola.

V.2 Rehabilitate vegetation of front yard to enhance historic character and remove invasive species.
   a. Rehabilitate bed along east façade of house.
      i. Remove three non-contributing evergreen shrubs.
      ii. Repair soils for 3’x14’ bed.
      iii. Establish bed edge. Consider adding metal bed edging.
      iv. Plant a mixture of herbaceous, perennial flowers such as bearded iris and daylily and naturalizing bulbs such as grape hyacinths. To the degree possible,
select historic cultivars existing in Ohio prior to 1906 or select modern cultivars that have characteristics similar to historic varieties.

b. Rehabilitate planting south of entry landing.
   i. Remove non-contributing burning bush (Euonymus alatus) shrub.
   ii. Plant flowering crabapple with a multi-stem, rounded form (e.g. Malus 'Hozam' Holiday Gold or Malus 'Bob White') to demonstrate the character of the historic, missing apple or crabapple tree.
   iii. Plant turf over remaining 30sf.

c. Rehabilitate street trees in curb lawn along N. Paul Laurence Dunbar Street. Coordinate with City of Dayton Public Works Department to plant three, high-branching, deciduous shade trees in historic locations west of lot line locations. At least one of the historic trees in the tree lawn was a maple (Acer sp.). Species selection should to be determined in consultation with the city arborist.

V.3 Rehabilitate vegetation of side yard to enhance historic character and remove invasive species.

a. Remove three eastern red-cedar trees from south slope.

b. Plant river birch (Betula nigra) in the side yard south of porch. Select single stem specimen.

c. Plant five deciduous trees in the side yard along the south property boundary. Select a mixture of native species common to Dayton. From west to east consider:
   i. sugar maple (Acer saccharum)
   ii. black walnut (Juglans nigra)
   iii. American hornbeam (Carpinus caroliniana)
   iv. shagbark hickory (Carya ovata)
   v. black tupelo (Nyssa sylvatica)

d. Plant four deciduous shrubs in the side yard near historic locations. Based on historic forms in photographs and documented references, select bridalwreath spirea (Spiraea prunifolia), snowball hydrangea (Hydrangea arborescens), flowering quince (Chaenomeles speciosa), and sweet mock-orange (Philadelphus coronarius).

e. Remove non-contributing, 27sf bed near path along south elevation of house. Replace with turf.

f. Remove non-contributing trumpet creeper (Campsis radicans) vine and rambling rose (Rosa sp.) from east façade of barn. Replace with lily-of-the-valley (Convallaria majalis) to be transplanted from bed to north.

g. Rehabilitate southwest bed by barn. Maintain lily-of-the-valley. Remove all invasive plants and woody seedlings.

h. Plant varieties of garden pansies (Viola tricolor) in a 5’ diameter circular bed in the lawn south of the porch. Consider adding metal bed edging.

V.4 Remove English ivy (Hedra helix) from backyard area north of house. Replace with turf.
Circulation

C.1 Preserve and repair contributing circulation features that contribute to the historic character of the Dunbar landscape.
   a. Preserve stone porch steps.
   b. Repair stone walkway at south side of barn. Lift flagstone pavers and stone step and reset on new base.

C.2 Restore front entry steps and path to enhance historic character.
   a. Remove concrete entry walk west of sidewalk, front steps, railings, and upper landing near porch.
   b. Replace in-kind four limestone steps (6'-6"x12"x9") at entry walk. The steps with the historic 12" tread to 9" riser ratio do not form part of the primary circulation route for visitors.
   c. Rehabilitate walk and landing in historic form with light aggregate concrete.

C.3 Provide universally accessible pedestrian route between proposed barrier-free parking areas, the Visitor Center, and the historic Dunbar property. Comply with federal regulations and codes to meet accessibility standards including the Architectural Barriers Act Accessibility Standards (ABAAS) and the NPS Denver Service Center Accessible Route Design Standards (DSC ARDS). A detailed assessment of the existing condition of the existing route is provided in Chapter 3.
   a. Add one barrier-free parking space with curb ramp near the Visitor Center entrance.
   b. Add one barrier free bus parking space with curb ramp along Edison Street.
   c. At sidewalk along south side of Edison Street, remove 160' of poor condition paving and construct new concrete sidewalk.
   d. Add 12"x14" section of concrete paving in place of stones adjacent to south Visitor Center door to ensure 24" maneuvering clearance for the door.
   e. Provide design of area around the accessible lift to meet ABAAS and DSC ARDS. Refer to building treatment recommendations in Chapter 7.

C.4 Provide a barrier-free route to the porch. Expanding barrier-free access to the porch enables all visitors to experience the historic entrance to the house and the restored historic character of the front and side yards.
   a. Modify concrete paving west of house between pergola and Visitor Center. Ensure minimum 36" clearance from lift and remove excess concrete surfaces.
   b. Add new 4' path to the concrete walk south of the house from the barrier-free path under the pergola. Construct path with dark colored aggregate concrete. (See B.2).
   c. Replace concrete walks south of house with 3’ wide concrete walk with light aggregate.
   d. Add sloped walkway at 4% to meet DSC ARDS that provides access to the porch in accordance with the building treatment recommendations in Chapter 7.

C.5 Add barrier-free path to the carriage barn to expand potential programmatic and interpretive opportunities. (Also see C.1.b).
   a. Construct 3’ wide sloped path with dark colored aggregate concrete to access barn.
   b. Protect adjacent flagstone path.
   c. Construct 4’x3’ angled wooden walkway at threshold of barn.
Chapter 6 - Landscape Treatment Recommendations

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C.6 Provide barrier-free access to the alley as a secondary path. The slope of the alley near the barn is 4% and meets DSC slope requirements for accessible routes; however, the alley north of the historic site exceeds 5% which does not meet the DSC required code for pedestrian egress. Non-routine use and emergency egress may be improved by enabling access to the alley.

a. Replace concrete walk north of barn and under pergola with 4’ wide walk with light aggregate concrete.
b. Add 5’ walk with dark aggregate concrete between alley and path north of barn.
c. Repair asphalt entry to barn from alley.
d. Repair gravel maintenance zone between the barn and the alley.

Buildings and Structures

B.1 Preserve and maintain the exterior of the Dunbar House and carriage barn in accordance with the building treatment recommendations in Chapter 7.

B.2 Modify non-contributing, compatible wood pergola to provide barrier-free access through the south side of the pergola to the barrier-free path to the porch.

a. Provide 48” clear way for 36” wide walk. (See C.4).
b. Add one 4”x4” post to affix shortened side rails.

Small-scale Features

F.1 Preserve historic, small-scale features that contribute to the historic character of the Dunbar landscape.

a. Protect, repair, and maintain cast iron fence remnant in front yard.
b. Protect and maintain woven wire fence remnant in backyard. Remove entangling English ivy.

F.2 Replace oversized hand railings at steps between Visitor Center and pergola with metal railing that will extend 12’ from the first riser nosing to meet ABAAS requirements.

F.3 Add 4’ high woven wire fence along the north property edge. Select fence design that is compatible with but differs from the historic woven-wire fence remnant.

a. Add 37’ fence between the interpretive shed and west side of steps to Visitor Center.
b. Add 9’ fence between the east side of steps to Visitor Center and existing metal fence north of house.

F.4 Rehabilitate the historic backyard enclosure to better reflect the character of a private residential yard. Consider either option F.4.a, F.4.b, or F.4.c.

a. Add 7’ high wooden picket fence and gate between barn and the north property line. The height and material reference the missing shed from the period of significance. Locate the fence under and east of the floodlight to minimize shadows and increase safety and security at night. (This option is shown on Drawing T1).
b. Add a simple shed form along the west property line to create mass in the backyard and interpret the historic, missing shed north of the carriage barn.
i. Construct a 9’x9’, one-story wood-clad shed.
ii. Relocate site lighting on the Visitor Center lot to the north to provide safety along the alley and in the backyard.

F.3 Modify existing, non-contributing signage to enhance historic landscape character and improve visitor experience.
a. Add a new, smaller park identity sign outside of primary viewsheds toward the house, which will recapture historic views to the side yard and front porch from the public right of way. The sign will express the State and NPS partnership.
   i. Remove existing park identity sign and brick piers and restore slope and turf in front yard.
   ii. Add new park identity sign in raised bed near Visitor Center entrance along Edison Street.
b. Remove state historic marker from northeast corner of front yard and install the same sign in the southeast corner of the property.
c. Remove the interpretive wayside from entry steps and install it at a lower height near sidewalk near northeast corner of property.
d. Remove oval historic site marker sign from metal gate north of house.

F.6 Install foundation and downspout drains. Refer to building treatment recommendations in Chapter 7.
a. Install new north foundation and downspout drain in new drain location.
b. Install new south foundation and downspout drain in existing drain location.

Archeological Sites
A.1 Protect potential subsurface resources.
a. Review proposed projects that involve ground disturbance with the NPS cultural resource management team.
b. Provide archeological monitoring and data recovery during ground disturbing activities.
Landscape Treatment Implementation

The implementation plan organizes the recommended action-oriented tasks for landscape treatment into project groups. Project Groups 1 through 4 are presented in the order of priority recommended for implementation. For each project group, a brief description of the treatment is followed by an abbreviated list of tasks. Locations of projects are illustrated on Landscape Treatment Plan T1.

Project Group 1: Provision of Improved Site Parking and Access

Project Group 1 provides barrier-free access to the Visitor Center. Tasks include improved streetside parking and sidewalk access to the Visitor Center on Edison Street. Activity in the public right-of-way would require coordination with the City of Dayton.

C.3. Provide universally accessible pedestrian route between proposed barrier-free parking areas, the Visitor Center, and the historic Dunbar property.

Project Group 2: Provision of Barrier-Free Routes within the Site

Project Group 2 improves pedestrian circulation between the Visitor Center and the Dunbar property in order to provide functional barrier-free routes from the Visitor Center to the historic site. A primary barrier-free route is established from the Visitor Center to the back door and porch of the Dunbar House. Secondary barrier-free paths enable access to the barn and alley. Tasks help to more closely align the primary barrier-free route with other routes for visitor circulation. Improved accessibility includes reducing changes in grade, widening some paths, and assuring required maneuvering clearances.

C.4 Provide a barrier-free route from the Visitor Center to the Dunbar House and porch.
C.5 Add barrier-free path to the carriage barn
C.6 Provide barrier-free access to the alley as a secondary path.
B.2 Provide barrier-free access through the south side of the pergola to the barrier-free path to the porch.
F.2 Replace hand railings at steps between Visitor Center and pergola.

Project Group 3: Restoration of Front and Side Yards

Project Group 3 includes the restoration of landscape features in the front and side yards for the purpose of enhancing historic character to improve the visitor experience. This includes removing non-contributing features, restoring historic circulation, planting vegetation of the period of interpretation, rehabilitating paths, and relocating signage.

V.1 Preserve vegetation that contributes to the historic character of the Dunbar property.
V.2 Restore vegetation of front yard.
V.3 Restore vegetation of side yard.
F.1.a Repair cast iron fence remnant in front yard.
F.5 Modify existing, non-contributing signage to enhance historic landscape character and improve visitor experience.
Project Group 4: Rehabilitation of the Backyard

Project Group 4 includes the continued rehabilitation of backyard features of the backyard for expanded programmatic and interpretive opportunities, increased visitor access, and enhanced historic landscape character. Provision of access to the barn would expand site accessibility. Addition of boundary fences would enhance the historic feeling of the backyard.

V.4  Replace English ivy (*Hedera helix*) with turf in backyard area north of house.
F.1.b.  Protect woven wire fence remnant and remove entangling English ivy.
F.3  Add woven wire fence along the north property edge.
F.4  Add wooden picket fence and gate between barn and the north property line.
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CULTURAL LANDSCAPE AND HISTORIC STRUCTURES REPORT
PAUL LAURENCE DUNBAR HOUSE
DAYTON AVIATION HERITAGE NATIONAL HISTORICAL PARK
TREATMENT RECOMMENDATIONS
DAYTON, OHIO

INDEX OF DRAWINGS

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- Dunbar House National Historic District site treatment recommendations boundary
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Legend
- Historic lot boundary
- Preserve buildings
- Restore historic paths
- Add new paths
- Repair public sidewalk
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- Replace in-kind steps
- Add barrier-free parking
- Add bus parking
- Add new woven wire fence/gate
- Add new wood fence
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- Install new drain lines
- Modify signs
- 1 foot contour
- 5 foot contour
- Proposed contour

Notes and Sources
2. QEA, De Vries, Field investigations, 8/2018.
3. Vegetation treatment is illustrated on Vegetation Treatment Drawing T-2.

Refer to architectural drawings

Alley
Edison Street

Dayton Aviation Heritage National Historical Park

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F.5.b
W.1
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North Paul Laurence Dunbar Street

Historic lot boundary
Preserve buildings
Restore historic paths
Add new paths
Repair public sidewalk
Repair gravel
Replace in-kind steps
Add barrier-free parking
Add bus parking
Add new woven wire fence/gate
Add new wood fence
Preserve woven wire fence remnant
Repair cast iron fence
Install new drain lines
Modify signs
1 foot contour
5 foot contour
Proposed contour

Add new woven wire fence/gate
Add new wood fence
Preserve woven wire fence remnant
Repair cast iron fence
Install new drain lines
Modify signs
1 foot contour
5 foot contour
Proposed contour

Northern Laurel Avenue

Historic lot boundary
Preserve buildings
Restore historic paths
Add new paths
Repair public sidewalk
Repair gravel
Replace in-kind steps
Add barrier-free parking
Add bus parking
Add new woven wire fence/gate
Add new wood fence
Preserve woven wire fence remnant
Repair cast iron fence
Install new drain lines
Modify signs
1 foot contour
5 foot contour
Proposed contour

Add new woven wire fence/gate
Add new wood fence
Preserve woven wire fence remnant
Repair cast iron fence
Install new drain lines
Modify signs
1 foot contour
5 foot contour
Proposed contour

Add new woven wire fence/gate
Add new wood fence
Preserve woven wire fence remnant
Repair cast iron fence
Install new drain lines
Modify signs
1 foot contour
5 foot contour
Proposed contour
Notes and Sources:
2. QEA, De Vries, field investigations, 8/2018.
3. Hardscape treatment is illustrated on Site Treatment Drawing T-1.
BUILDING TREATMENT RECOMMENDATIONS
Chapter 7 | Building Treatment Recommendations

Treatment drawings for the House and Barn can be found following this narrative.
A magnitude of cost estimate that addresses the treatment recommendations is found in Appendix G.

Summary

The Paul Laurence Dunbar House and Barn offer interpretive opportunities to learn about the life and poetry of Dunbar in a unique setting that provides insight into his private life where he worked and died. The Ohio Historical Society, Dayton History, and the National Park Service have partnered to tell Dunbar’s story. The unique resources adjacent to the house property offer visitor support services, so that the house and barn may be preserved without major alterations for the next several generations to learn of Dunbar’s talents and perseverance.

The house currently serves as a house museum, focusing on the life and works of Paul and his mother, Matilda. They purchased the house in 1904, and Paul died in the first floor Reception Room in 1906. Matilda continued to reside in the house, with the goal of keeping the house and Paul’s Loafing Holt (library) and bedroom as a shrine to her son and his achievements. Matilda died in 1934. The state of Ohio purchased the house soon after Matilda’s death, making it the first publicly-owned house museum to honor an African American. The house has been open to the public since 1938. In 1962, the Paul Laurence Dunbar House became the first National Historic Landmark in the United States to be established in honor of an African American. Since that time, the OHC has endeavored to maintain and expand the interpretation of Dunbar and the site through many house and barn preservation and rehabilitation projects and through the creation of the adjacent visitor center.

The focus of this study is to provide guidance for required immediate maintenance and repairs and to provide long term recommendations. The goal is to correct life safety and building code issues, perform required maintenance and repairs, provide accessibility for those with mobility impairments, and preserve the home for future generations to continue to learn about Dunbar and his legacy.

Treatment Considerations

The adjacent visitor center was constructed on the adjacent site at a lower elevation than the Dunbar House without consideration of universal design or accessibility. Later, an exterior lift was constructed that provided persons with mobility impairment access from the Visitor Center to the sidewalk and pergola area at the back of the house. Guided tours of the Dunbar House begin at the front door with the raised porch; therefore, access is provided to the first floor of the house through the back door for visitors requiring wheelchair entry. The exterior lift is exposed to the elements and has become a maintenance issue. The lift is difficult to operate during inclement weather. Options to relocate the lift are presented in the treatment recommendations.

Providing a safe environment for learning and the overall building performance is important for the longevity of the house, which includes providing modern technologies into the structure. The
implementation of these recommended treatments must be thoughtfully considered as the house has retained a significant amount of historic interior and exterior finishes from the period of significance. All recommended treatment work must meet The Secretary of the Interior’s Standards for the Treatment of Historic Properties, specifically for Rehabilitation. Rehabilitation of the house allows for the required repairs, maintenance, and the accommodation of twenty-first-century conveniences and necessities while preserving its most significant historic features. These guidelines provide a framework to test decisions associated with the house and barn maintenance, repairs, and proposed alterations and upgrades.

The period of significance for the Dunbar House and Barn is 1904-1936, which encompasses the residency of Paul and Matilda Dunbar and the eventual ownership and creation of the Paul Laurence Dunbar State Memorial by the Ohio Historical Society. Significant renovations since that time are discussed in Chapters 2, 3, and 4. The home has been in continuous use as a historic site since 1938 and the OHC, Dayton History, and NPS plan to continue to provide these services.

The proposed treatment recommendations for the house and barn focus on addressing:

- Architectural Barriers Act Accessibility Standard (ABAAS or ABA) accessibility through the site and first floor of the house.
- Provide a plan for an accessible path to the barn for future interpretive utilization of the barn structure.
- Life-safety and building code issues.
- Building stabilization.
- Preservation, maintenance, and repair of building materials.
- Providing visitor services in keeping with the historic character of the building.

The treatment recommendations do not address interior finishes, furnishings, decorative lighting, equipment, or interpretation.
Dunbar House Building Code and Life Safety

Existing code and life safety of the Dunbar House
The Paul Laurence Dunbar House is currently used as a House Museum.

References:
International Existing Building Code (IEBC) 2012
International Building Code (IBC) 2012
Architectural Barriers Act Accessibility Standard (ABAAS or ABA)

Current Use or B (Museum), 2-Stories
No Change of Use Proposed

Construction Type VB

Fire Alarm with Smoke Detection throughout
Unsprinklered Building

Gross Square Footage
- Basement 978 sf
- First Floor 1,117 sf
- Second Floor 978 sf
- Total 3,073 sf

The attic is unoccupied due to the sloped ceilings.

Occupant load for the building, per IBC –
- Basement (Building Services) sf / 300 sf = 3 persons
- First Floor sf / 30 sf = 37 persons* (limited to 22)
- Second Floor sf / 30 sf = 32 persons** (limited to 29)

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.

*Structural calculations recommend a visitor limit of 22 persons due to the current floor structure capacity.

**Single Exit Building – Section 1021.2 (2), Allows for up to 29 people on the second floor (Figure 4.155 next page).

Exit Signage is not required for spaces requiring only one exit, but it is recommended to post Exit signage at the first and second floor levels, per Section 1011.

Provide fire extinguishers within seventy-five feet of all parts of the building.
The building is currently only partially ABAAS accessible. Per 1104.4, Exception 1, the building is not required to have an accessible route to upper levels, due to the small size of the floorplate, being less than 3,000 square feet.

Allowable travel distance is 75 feet from the second floor. The diagram below outlines that travel distance from the entry into the second floor Sewing Room. This diagram also assumes the front door is unlocked during tour hours.

![Diagram of the building layout](image)

**Figure 7.1. Exit egress path of travel.**

**Accessibility**
Accessibility for the general public and museum staff is addressed in this section of the report. The Landscape Existing Conditions considered the accessible path from the Visitor Center to the Dunbar House and around the site. This portion of the report is considering access from within the Visitor Center to the back yard elevation and then from the back door of the Dunbar House through the first floor. Accessibility of exhibits and interpretive elements within the house are not addressed in this scope of work.
The Dunbar House was constructed in 1887-88 as a single family residence with multiple levels - a basement, first floor, second floor, and attic. The house sits on raised grade, above the street and sidewalk and also above the adjacent Visitor Center to the north. There are steps from the sidewalk to the yard, steps from the yard to the front porch, and a step up into the house at both of the front entrance doors. The back porch door would have originally had a step, as well, but the sidewalk has been modified to provide barrier-free access to the back door during a previous renovation.

Currently, guests and staff enter the Visitor Center to begin their site visit and guided tours. All tours exit the south door of the Visitor Center. The Visitor Center building site is several feet lower than the backyard elevation of the Dunbar property. In-grade concrete steps or an exterior accessible lift are utilized to enter into the backyard of the Dunbar House. Issues associated with this approach are discussed in more detail in the Landscape Existing Conditions section of this report in Chapter 3. Visitors take the sidewalk to the grape arbor and then towards the south yard and front of the house or to back door of the house. Currently, all guided tours utilize the front porch entry into the Reception Hall. Only visitors with mobility impairments utilize the back door. The sidewalk was poured up against the wood threshold of the back door to attempt to provide an ABA-compliant threshold at the door. The goal of museum staff is to have the first floor be accessible for all visitors. The site and front porch access are discussed in Chapters 3 and 6.

ABA Standards:
- Beveled thresholds allow a change of level of ½-inch (¼-inch vertical and ¼-inch beveled). In no case may the combined change in level exceed ½-inch.
- Turning space shall be 60-inches in diameter.
- The clear width of walking surfaces shall be 36-inches, except they may be permitted to be reduced to 32-inches at doors. This 32-inches is measured from the face of the door in the 90 degrees open position and the stop at the jamb.

Interior ABA Guidelines – Identification of Existing Barriers:
- Back Door 1/107:
  - The door opening is only 30-inches in width and 29-inches clear between the door stops. This does not meet the current ABA width guidelines.
  - The threshold at the door is 1-inch high on the interior side of the door and over ¾-inch high on the exterior of the door. This is well above the allowable threshold height.
- Door 1/104 to the Kitchen:
  - The door opening is 33 1/4-inches in width, and the clearance is 31 7/8-inches between the door stops. This does not meet the current ABA width guidelines.
  - There is a thin wood threshold installed over the historic stone threshold below. The wood threshold to bridge the discrepancies between the finish floor elevations of the kitchen and back porch. It is ¾-inch high on the interior side of the door.
- Door 2/103 to the Dining Room:
  - This door and the jamb have been modified from their original condition. There is a full-height, applied stop on the south jamb to accommodate the swinging door hardware that was installed. This is a double-action door that is held open during tours with a hook and eye. The clearance between the stop and the door is only 30 ¼-inches. The overall door opening width without the stops is 32 ¼-inches, which does not account for the door itself.

- Door 1/103
  - This door opening is just over 33-inches, and the clearance between the door stops is 31 7/8-inches.
  - This door opening does not meet current ABA width guidelines.

It is clear from the survey of the existing accessible path that all of the doors, in their current configuration, are too narrow to meet current ABA standards. The interior doors are close to meeting the standard, while the back Door 1/107 is too narrow and would require significant widening to meet ABA, as this opening is nearly 3-inches too narrow.

The enclosed porch was present during Dunbar’s residency. The 2001 paint analysis study by Welsh Color & Conservation sampled the exterior trim of the back Door 1/107 and found that the trim was contemporary with the second layer of finish painting of the house (likely painted prior to Dunbar’s residency), while the shed siding and windows are from the mid-20th-century. This study suggests that along with the significant alterations of the back porch room since the death of Matilda Dunbar, many of the interior and exterior finishes are likely not from the period of significance. The door and trim, however, appear to be from the period of significance. Without further investigation, it would be difficult to determine if the back door is original.

The wood threshold of Door 1/107 is deteriorated and requires replacement, and the replacement should be carefully coordinated with the replacement of the sidewalk approach to ensure conformity at the transition.

The Doors 1/104, 2/103, and 1/103 are historic and in original jambs. They are very close to accommodating the 32-inch required clearance. Door 2/103 could be temporarily removed to curatorial storage if access became an issue. Door 1/104 could have a custom wood threshold made to meet the required threshold guidelines. The existing threshold could be put in curatorial storage.

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Figure 7.2. Existing exterior lift at the Visitor Center. (STRATA 2018)

Figure 7.3. Existing sloped walkway to the back door of the Dunbar House. (STRATA 2018)
Figure 7.4. Door 1/107 entrance at the Enclosed Porch and deteriorated wood sill. (STRATA 2018)

Figure 7.5. Door 1/104 between the Porch and the Kitchen. The wood threshold was added to the top of the stone sill to transition between the Porch and Kitchen floors. (STRATA 2018)
Figure 7.6. Door 2/103 between the Kitchen and the Dining Room. This is a double-action, swinging door. The red arrow is the accessible path of travel. (STRATA 2018)

Figure 7.7. Door 1/103 between Dining Room and the Reception Hall. The red arrow is the accessible path of travel. (STRATA 2018)
Context of Accessibility Design within Historic Properties

The following information is available from the Access Board’s website.

Historic properties are not exempt from federal accessibility requirements. The National Park Service (NPS) utilizes the ABA Accessibility Standards (ABAAS) that have been adopted by the General Services Administration (GSA) and apply to all facilities, as well as trails, picnic and camping areas, viewing areas, and beach access routes.

The current standards are to apply to facilities designed, built, altered, or leased with federal funds. These standards were developed and passed into law in 1968 and apply to national parks. For guidance on specific standards, assistance is provided by the United States Access Board https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/guide-to-the-aba-standards, which includes diagrams and animations.

The Rehabilitation Act of 1973 (Section 504) is another law which requires compliance with access standards with a broader scope than ABA’s. Compliance with access standards is required for facilities undergoing alteration or retrofitting existing facilities.

The ABA guidelines do provide some exceptions specific to existing facilities. The standards apply directly to the altered areas and additions. There are no retrofit mandates. However, Section 504, which addresses access to federally funded programs may necessitate retrofits even where no alterations are planned. This act also requires accommodations for employees with disabilities in the federal sector. Waivers or modifications can be granted in unique circumstances if compliance is exceptionally problematic. Facilities that met the standards that were in effect at the time of its construction or rehabilitation are not required to be brought into compliance with the latest edition of the ABA. However, any new alterations or additions must comply with current ABA Standards.

Alterations to Qualified Historic Facilities, per F202.5, provides specific provisions for qualified facilities that are “listed in or eligible for listing in the National Register of Historic Places.” The Dunbar House is listed as a National Historic Landmark, and therefore, these provisions apply. The standard requirements for alterations apply for historic buildings, with several exceptions where compliance with the ABAAS standards would threaten or destroy the historic integrity or significance of the building, as determined by the State Historic Preservation Office or Advisory Council on Historic Preservation. These exceptions generally apply to accessible routes, entrances, and toilet rooms.

- **Vertical Access**: Access to stories above or below the accessible story is not required (F206.2.3, Ex. 7)
- **Accessible Route**: One route is required from a site arrival point to an accessible entrance (F206.2.1, Ex. 1)

• **Public Entrance:** One public entrance is required to be accessible (if that would also threaten the historic significance, access can be provided to a non-public entrance, but a notification or remote monitoring system is required for locked entrances) (F206.4, Ex. 2).

**Current Use**
The Dunbar House is currently open to visitors on a schedule that is determined by the park interpretive staff. Visitors access the site from the adjacent Visitor Center or potentially from the front steps in the Dunbar yard from the street. This analysis of the accessibility of this approach from Paul Laurence Dunbar Street and Edison Street to the Dunbar site is addressed in the Landscape Existing Conditions section of this report. All visitors who tour the Dunbar House begin their tours in the Visitor Center. All visitors enter with a guide through the front door, with mobility impaired visitors using the back door.

The Dunbar House and Barn are historic structures and are interpreted as part of the overall historic cultural landscape within the context of the Dunbar National Register District.

**Interpretation** –
- The Visitor Center provides visitor services, including restrooms, drinking fountains, educational facilities, and exhibits. Guides take visitors in small groups through the Dunbar House. The house is not open to the public without being on an arranged tour.

**Equitable Use** –
- Because only the first floor is accessible, the experience of disabled visitors is different than those who can experience the second floor of the house, which contains Paul’s library, bedrooms, and a period bathroom.

**Approach and Use** –
- The layout of the first floor appears to be appropriate with regards to size and space provided for approach, reach, manipulation, and use regardless of the user’s body size, posture, or mobility. The door widths between the first floor primary spaces are narrow and do not meet the ABA guidelines for clearance. There is adequate space provided for the use of assistance devices of personal assistance. Some non-permanent furnishings may need to be relocated to keep a clear path of travel on the first floor, such as the kitchen table and chairs.

**Integrated Pedestrian Routes** –
- Currently, guided tours enter through the front door. Mobility impaired visitors enter through the back door. Tours being in the Reception hall and follow the same route through the first floor. However, the second floor is not accessible to persons with disabilities.
Entrances –
- The walkways to the back door and the door are not covered or protected from the elements.
- The entrance door and interior doors in the path of travel, along with their clearances are described in the previous section.

Exception –
- One floor in the multi-story building is accessible. Per ABAAS F202.5 for qualified historic buildings, an accessible route shall not be required to stories located above or below the accessible story. However, programmatic access is required for all programs provided on all floors.

Fire Alarm Systems –
- F215.2 Public and Common Use Areas – Alarms in public use areas and common use areas have permanently installed audible and visible alarms complying with ABAAS 702.
- F215.3 Employee Work Areas – Where employee work areas have audible alarm coverage, the wiring system is designed so that visible alarms can be integrated into the system.

Signage –
- No signage, per ABAAS requirements is currently installed.

Stairs 504 –
- Stairs are considered part of the required means of egress and must meet the Standards.
- Risers – Current rise is 7 3/4-inches. The code is 7-inches max
- Treads – 11” minimum – Current treads are 9 1/2-inches with ¾-inch nosings.
- No visual detection at nosings
- Nosing 1 ½” max – ¾-inch nosings,
- Stairs not part of a means of egress are not required to meet the standards (attic)

Handrails 504.6 505 -
- Required on both sides – Only on 1 side
- Railing height 34-46” – Meets dimensions
- Top extension 12” min – No extension
- Bottom extension – 1 tread depth – must return to wall – Current no extension.
- Current Handrail does not meet cross section requirements of 2-inches max.
Proposed Accessible Route and Modifications

The accessible route from the Visitor Center and through the Dunbar House are shown in the figures below.

![Figure 7.8. Accessible Route through buildings and site.](image)

Options for potential relocation of the lift into the interior of the Visitor Center are shown. The advantages to having the lift moved to the interior:

- The existing clearances at the lower level of the lift do not meet ABA standards.
- Less maintenance with the lift installed inside, rather than on the exterior where it is exposed to weather.
- Provide a more user-friendly lift approach and use.
Moving the lift to the interior of the Visitor Center will require modifying the existing men’s restroom to accommodate the new lift. If two lavatories are desired in the restroom, the restroom would need a more significant modification and enlargement to the north, which would be more costly than shown in the proposed options below. Three options for the lift location and exiting the Visitor Center are shown below.

Figure 7.9. Option 1 – Lift inside the Visitor Center with new exterior door and new hood over door. (Preferred Option)
Figure 7.10. Option 2 – Lift within the new exterior vestibule. The lift is entered from inside the building.
Figure 7.11. Option 3 – Lift inside the Visitor Center with new exterior vestibule.
Treatment Recommendations

A detailed scope of work, including architectural, structural, mechanical, plumbing, and electrical work follows. This work is categorized by:

- **General Scope of Work** – Work that applies to the entire project and all phases of work.

- **Immediate Treatment Recommendations** – Work that is recommended to be completed immediately, as there are potentially life safety or hazardous concerns to be addressed that may affect the long term preservation of the structures.

- **Long Term Treatment Recommendations** – Work that is recommended to complete the desired programming and upgrades for the buildings within the next 2-10 years. Some of these long term recommendations present major infrastructure upgrades, such as the installation of a new fire suppression system in the house and barn. Planning for the Long Term Treatment Recommendations should begin immediately. It is assumed that the work will need to be phased to accommodate for required design and for potential funding availability.

**Treatment Recommendations Organization:**

*Treatment Drawings for the House and Barn can be found at the end of this Chapter. A Class ‘C’ Cost Estimate related to this initial scope of work for the Dunbar House and Barn Rehabilitation can be found in Appendix G.*

The Treatment Recommendations are outlined below, as:

**General Scope of Work**

**Exterior Treatment**
- Immediate
- Long Term

**Interior Treatment**
- Immediate
- Long Term

**Barn Treatment**
- Immediate
- Long Term
General Scope of Work:

A. All repairs and construction work performed for this structure and the surrounding site shall be performed in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties, specifically for Rehabilitation.

B. Concrete and wood repairs or additions for the structure shall be impressed with a permanent, inconspicuous date stamp, ‘NPS Year.’ Every effort should be made for these to be on the back side of a finished item and not visible.

C. Before work can begin, all hazardous materials scheduled to be removed shall be addressed. Materials testing by Terracon in 2018 can be found in Appendix F. Also, refer to the description of the hazardous materials in Chapter 4, Existing Conditions.

D. All exterior paint is assumed to contain lead. Contractors must take all precautions, per the State of Ohio laws, when working with painted historic trim and other building components.

E. Any excavation work on the site, including excavations inside the basement of the house, shall be performed in close coordination with OHC and/or NPS archeologists.
   - All ground disturbing activities in and around the foundation of the building need to be precisely indicated in project planning documents to be reviewed by archeologists prior to implementation. While previous archeological excavations have taken place on the site, not all areas have been previously excavated. Additional archeological excavations may be required if any proposed components of the project are placed outside of the location of previous excavations.
   - Provide detailed, specific plans for ALL ground disturbing activities planned at the site, so it can be determined if areas planned for disturbance have been previously excavated. If the area has been previously disturbed by other activities, documentation to that affect must be provided.

F. Any items removed during cleaning or rehabilitation should be closely documented prior to removal and inventoried by the OHC curator. Items which are part of the barn may continue to be stored in the barn, or another designated state-owned facility.
Exterior Treatment

General Exterior Treatment

A. Perform mortar testing for the historic stone and historic brick mortar. Test both bed mortar and pointing mortar. Utilize this mortar analysis for future repointing. Match all historic mortar composition, including hardness, aggregate, and tooling.

Immediate

1. Repair roof leak at the rear porch, north end. During the August 2018 investigation, rain was dripping down the interior brick wall, just north of the north door into the West Pantry. This may be a flashing issue under the second floor Window 206.

Long Term

2. Foundation –
   - Seal penetrations through foundation wall.
   - At the front porch, the perimeter stones do not appear to have sufficient bearing. It is recommended to demolish the adjacent sidewalk and fill voided space below stones. Additionally, the sidewalk should be reconstructed to slope gently away from the house, and the joint between the sidewalk and the stones should be filled. The easternmost stone at the corner of the porch should be jacked or lifted to be level and the cast iron framing will be solidly seated on the stone.

3. Exterior Walls
   - The exterior brick masonry should be 80% repointed. Selected deteriorated bricks should be removed and replaced. Deteriorated header bricks shall remain in place; do not attempt to remove and replace header bricks.
   - Exposed stone foundation shall be spot repointed. Remove all existing non-compatible mortar.
   - Helical anchors should be installed at the area of brick bulging on the south elevation. This repair would only stabilize the wall from further bulging. As an alternative, the exterior wythe of brick here could be removed and restacked flush with the rest of the wall. New brick anchors would need to be incorporated if the header bricks at this location are broken.
   - In order to enlarge the back door house entrance for ADA requirements, a new header will need to be installed in the wall, as well as a new jamb on one side of the door opening.
   - Bricks that have been patched with incompatible concrete patch material should have the patch removed. If possible, and there if there is adequate surface area, install compatible custom-colored, breathable brick patching compound, matching the historic brick texture. If bricks are too deteriorated, replace with antique salvaged or new bricks selected to match the color range, hardness, and size of the historic bricks.
• Bricks that are deteriorated and losing cross-section shall be replaced with antique salvaged or new bricks selected to match the color range, hardness, and size of the historic bricks.
• Remove all incompatible sealants from the limestone water table, and clean joints, as required to completely remove the sealant. Install new, compatible mortar.
• Clean exterior of the building utilizing a light detergent and light scrubbing with brushes with soft bristles and warm water. Do not utilize chemicals for cleaning. Do not power wash the masonry.
• Repair limestone lintel above the basement Windows 001 and 002.
• Infill damaged sawcut bricks (where the connector was removed) with soft, Type K mortar or breathable mortar patch (such as Conproco or Jahn), colored red to match the bricks. Repoint horizontal joints with regular mortar to help blend the cuts into the surrounding wall. With further inspection, it may be possible to carefully remove the damaged bricks and reverse them in the wall, while still patching the damaged areas with restoration brick patching material. Or, the damaged bricks could be replaced in kind, but that would result in the loss of potentially original material.

4. Chimneys
• No roof access was available at the time of this assessment, but there are visible water stains and small openings in the roof at the west chimney. It is recommended that a certified roofing professional investigate the condition of the flashing at the chimney/roof interface as well as the condition of the chimney caps. Repairs should be made as necessary.
• Inspect flashings on all chimneys and repair, as required.
• Repoint all three chimneys and provide new mortar wash, as required. Inspect the condition of the terra cotta flues. If they are in poor condition, consider installation of a lead-coated copper, or similar chimney cap to prevent further deterioration. Coordinate with need for central chimney mechanical ventilation.
• Replace the severely deteriorated bricks in the interior portion of the west chimney.

5. Windows:
• Restore all exterior windows, basement through attic. Remove flaking, peeling, or loose paint, and prime all areas of exposed wood. Remove any temporary stabilization measures from the window sashes. Replace deteriorated components, in kind, with compatible, exterior-grade wood. Install preservative treatment on all new wood. Prime with oil-based primer and top with two coats of fresh paint.
• Install storm windows on all window openings to provide thermal and UV protection. One option would be to install interior storm windows with UV protection, as recommended by the Foundation Document. As a second option, explore the installation of exterior storm windows with UV protection, which would also provide protection for the restored historic wood windows. A third option would be to install a

combination of interior or exterior windows, depending upon the level of visibility from the primary viewsheds.

- Maintain exterior storm windows on the basement 001 and 002 windows.
- Consider installation of security bars on interior face of basement windows.
- Restore all window shutters. Several are loose and have broken louvers.
- Reconstruct window wells with drains at both basement Windows 005 and 006.

6. Roof: Perform maintenance repairs on the slate roof and all flashings.

7. Drainage: Scope underground downspout drains for working condition. Install north downspout into new painted cast iron downspout boot and into underground drain.

8. Front Porch:
   - Install new handrails at the front steps to the porch.
   - Construct new ABA-compliant ramp at the west end of the front porch.
   - Clean white paint graffiti from the front porch north wall.

9. Exterior Trim and Board Walls – Touch-up prime and paint exposed areas of wood, especially near grade and where worn. Touch-up paint through the exterior, as required.

10. Restore plaque by front entrance.

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**Interior Treatment**

**Immediate Interior Treatment**

**Plumbing Systems**
A. The existing plumbing system shall remain in place. All pipes should be thoroughly inspected for leaks and repaired as necessary.

**Fire Protection Systems**
B. The functionality of the existing fire alarm system should be verified to ensure that all components are fully operational.

**Electrical Systems**
C. The existing electrical system should be visually inspected for damaged devices, uncovered junction boxes, 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. All existing cloth wiring should be removed and replaced with approved wiring methods.

D. 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. The existing gas service entry should be properly grounded at the transition from steel to CSST piping per current code requirements.

E. The functionality of the existing intrusion detection system should be verified to ensure that all components are fully operational.

**Mechanical Systems**
F. Ensure the existing furnace is vented through the existing chimney, per code.
Long Term Interior Treatment

Structural

1. Floor Framing

It is difficult to establish an accurate live load capacity for this structure due to issues related to the nature of the calculations and the identification of the wood species. The calculations involve 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 more than a century ago may have exceeded those of today. The identification of the particular wood sample sometimes cannot distinguish between very similar species. Species such as Eastern White Pine and Western White Pine cannot be separated based on wood anatomy, but they have different strength values according to code.

- A conservative analysis of the typical first floor framing joists based on the visible condition of the members and an estimate of the lumber grade, shows that the live load capacity would be approximately 42 psf. The International Building Code (IBC) in table 1607.1 Minimum Uniformly Distributed Live Loads… identifies loads for residential occupancy as a minimum of 40 psf.

- The future use of the structure has been identified as Museum Space. The IBC does not identify a loading for “Museum”. However, corridors (first floor) require a live load capacity of 100 psf. Lobbies, Moveable Seats and Other Assembly Areas also require a live load capacity of 100 psf. It is unlikely that the structure will experience loads of this magnitude.

- Rather than increase the capacity of the first floor joists, it is more reasonable to restrict the size of tour groups allowed into the house. Based on the calculated joist capacity and the greatest joist spacing observed in the house, a tour size of limit of 22 people would be appropriate.

Life Safety

2. Provide an accessible fire extinguisher every 75 feet within the building and at a minimum, one per floor.

3. Hardware

   a. Provide an allowance for historic hardware restoration and replacement of missing pieces. Work would include installation of replacement turned wood doorstops.

4. Storm Windows

   b. Several of the windows on the first and second floors currently have interior storm windows installed for energy efficiency. These storm windows do a very
good job at assisting with air infiltration, but they allow visible and UV light to infiltrate into the interiors, causing heat-gain and damage to historic finishes and artifacts.

i. Install new interior storms in a single piece of glass set within a bronze-colored aluminum frame, per the NPS recommended guidelines.  

ii. Storm windows must be removable for maintenance and cleaning.

iii. Clear glass may allow for up to 70% of the UV rays. New glass may be tempered and coated with a UVA/B film or coating surface to block heat-gain and UV light infiltration. The goal would be to block UV light while not significantly reducing the amount of visible light and altering color values. Thresholds for comparison include: 95% acceptable UV rejection, while evaluating the color appearance. Mockups should be produced for this selection.

iv. Storm windows must include ventilation to allow for condensation to evaporate and vent heat.

c. Install new interior storm windows in the basement and in the attic, as discussed in those sections below.

5. Operations: In addition to the installation of interior storm windows, it is recommended to close interior blinds and curtains when the museum is not open and to locate potentially light-sensitive furnishings away from the windows. Materials that are particularly light sensitive may also be covered when the museum is not open.

6. Investigation: Scope and video all of the chimneys. Confirm there are three flues in the central chimney. Were there thimbles in any rooms originally installed for heating stoves (Dining Room, Loafing Holt, Paul’s Bedroom, Mother Dunbar’s Bedroom, Enclosed Back Porch, Sewing Room?). If so, where? Which flues in the central chimney were used for hot air distribution for the basement furnace?

Mechanical Systems

7. The existing central heating and cooling system shall remain to serve the basement and first floor, including floor grilles.

a. The existing first floor system airflow is noisy. Explore options to reduce noise on the first floor from air movement through the ducts and vents. Inspect ductwork for dampers, and potentially install dampers, if none exist. Ensure enough return air is provided.

b. Clean all ducts to remain. Perform maintenance on furnace and replace air filters.

c. Install programmable, wireless thermostat with remote operation and monitoring capabilities.

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381 Museum Collections, p. 4.
d. If new grilles need to be installed to meet current air flow requirements, closely coordinate new locations with OHC architects to limit visibility and impact to original historic materials.

8. Ventilation air shall be the natural ventilation option per the Ohio Mechanical Code. The existing operable windows in each space are an approved ventilation strategy.

Electrical Systems

9. New electrical service should be provided to the Dunbar house. Coordination with the electrical service provider, DP&L, will be required to determine service size once final electrical loads are established.

10. 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 where the existing load center is located. This load center will be fed from below grade from a service disconnect located in the basement of the adjacent building to the north. If the existing grounding system is not sufficient, it should be updated, or a new grounding system should be installed for the building in compliance with NEC Article 250. Copper conductors from the service entrance point in the main building to the new load center in the basement of the Dunbar house shall be routed below grade in PVC conduit. Review and approval from DP&L will be required to locate the meter in an adjacent building.

11. The existing overhead power lines should be abandoned in place for historic authenticity.

12. All existing electrical devices, boxes, and wiring that cannot be salvaged or is not code compliant should be removed and discarded. Coordinate closely with the OHC to determine what, if any, equipment should remain for historical interpretation. Remnants of all ceramic insulators should be kept intact, as well as any unattached cloth wiring.

13. All new 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. Surface-mounted raceways shall not be utilized. Routing of any wiring shall be closely coordinated with OHC architects to avoid disrupting the historical appearance of the house. All existing ungrounded receptacles shall be replaced with new duplex receptacles that are properly grounded.

14. Light fixtures shall be provided throughout the house to achieve appropriate museum lighting levels (15-30 footcandles depending on the sensitivity to light of the specific objects/furnishings). Selection of fixtures for key areas, such as for the stairs and the Reception Hall 101, will be by the OHC architect. AFCI and GFCI protection shall be
provided as required to comply with NEC Article 210 requirements. It may be desirable for a single switch location within the house to turn on all lighting for ease of operation. This should be determined as part of the final design.

15. If the building is planned to have 50 or more persons in occupancy:
   e. 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
   f. 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.

16. It is recommended to provide emergency lighting at the staircase to the second floor, even if the threshold for code-required emergency lighting is not met. Installation of Concealite-type of fixtures to blend with the ceiling or within the adjacent wood-framed walls, is recommended.

17. Barn Supply: A new 60A load center should be installed at the west end of the house where the existing barn disconnect is located. This will feed new electrical loads in the barn. Branch circuits to the barn shall be routed below grade in PVC conduit and should be located adjacent to or below the sidewalk that connects the house to the barn. Coordination with the Civil Engineer and Architect will be required to determine the most appropriate routing to create the least disruption to the site.

**Plumbing Systems**

18. Existing plumbing fixtures and infrastructure in the house shall remain. The existing sanitary sewer service and domestic water service to the site will remain.

19. Further coordination with the gas service provider will be required to determine if the existing gas meter and service pipes are adequately sized for the increased gas load (new furnace) at the house. Black steel or CSST piping will be used for all above grade natural gas piping within the buildings. New fittings will need to be provided at the gas entry in the basement to allow the system to serve two furnaces.

20. Gas and condensate piping from the new furnace located in the attic shall be concealed within the existing fireplace chimney located near the center of the house and routed down to the basement. The gas line will be CSST and will tie in to the existing system where the gas main enters the building. The condensate pipe will be copper and will indirectly drain to the floor drain located in the basement slab.
Fire Protection Systems

21. The existing fire alarm system in the house should be updated to comply with OHC state requirements. The system shall be fully addressable. At a minimum, new heat detectors will be needed. One smoke detector will need to be installed adjacent to the main fire alarm control panel.

22. A new wireless fire alarm system such as the CWSI wireless system could be explored as an option for the new devices. Wireless repeaters would be needed on each floor to send and receive signals to the new devices.

23. Based on the Historic Property Assessment Matrix from Chapter 7, Appendix A of the National Park Service Reference Manual 58, Structural Fire Management, a fire alarm system is required for NPS-owned properties, and a fire sprinkler system is highly recommended for the structure. For a major building rehabilitation under NPS ownership, a variance request would be required by the Authority having Jurisdiction (AHJ) if no sprinkler system is installed. Because this is not an NPS-owned property, this recommendation is to be considered by the state, but may not be required unless there is a significant building rehabilitation planned in the future.

<table>
<thead>
<tr>
<th>For a total score of:</th>
<th>Scoring Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 14</td>
<td>Fire alarm system should be considered; however, Fire Suppression System May Not Be Needed for this Structure (variance request would be required if no system installed).</td>
</tr>
<tr>
<td>15 - 21</td>
<td>Fire alarm system required; Park may Want to Install a Fire Suppression System in this Structure (variance request would be required if no system installed).</td>
</tr>
<tr>
<td>22 - 28</td>
<td>Fire alarm system required; Park should Install a Fire Suppression System in this Structure (variance request would be required if no system installed).</td>
</tr>
<tr>
<td>29 - 35</td>
<td>Fire alarm system required; Suppression System Required (variance request would be required if no system installed).</td>
</tr>
</tbody>
</table>

HOW TO USE THIS MATRIX

Rate each historic structure or other collections facility according to the 7 elements above, using a score of 1-5 (levels 1-5).
24. A new fire sprinkler system should be installed in the house to comply with NFPA and applicable code requirements. The new system should be a wet pipe system designed per NFPA and shall be fed from the existing fire sprinkler riser located in the basement of the adjacent house on the corner. Piping shall be routed below grade from the existing riser to the basement of the Dunbar house. The piping will need to be routed through the basement of the corner house as well as the adjacent house and shall be properly protected. Below grade 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.
Options: If a wet system is NOT desired to be installed throughout the House due to concern about leaks or potential accidental line breaks, a wet system could be limited to only serve the basement with a dry type system serving the rest of the House. A dry sprinkler system requires more valves and sprinkler heads and are more expensive than a wet system. It is understood that the Ohio SHPO recommends the dry system on upper floors and west system in the basement. Calculations would need to be done to ensure that the maximum required delivery times can be achieved. Another option to avoid a wet sprinkler system throughout the House would be to explore a pre-action sprinkler system. This system would require the addition of new smoke detectors in all spaces and the overall system cost would be greater.

25. A flow test and extensive calculations will be required to determine if adequate pressure exists to feed the new system. If adequate pressure does not exist, a fire pump will need to be added. If a fire pump is added the existing riser will need to be replaced/reconfigured to allow the addition of a pump.

26. The location of the primary fire alarm control panel will need to be closely coordinated with OHC architects to ensure the panel is conveniently located for reference and for servicing, while not detracting from the historic ambience of the House. Options would need to be developed to explore potential locations in the least-visible location.

27. Barn - A dry type sprinkler system is required for the unconditioned barn. The compressor and dry valve for the dry system will be located in Basement 001 and the piping shall be routed below grade over to the barn. It should be located adjacent to or below the sidewalk that connects the house to the barn. Coordination with the Civil Engineer and Architect will be required to determine the most appropriate routing to create the least disruption to the site. The dry system will require a connection to the main fire alarm panel for monitoring purposes.

28. Due to the sensitive nature of the historic structures, it will be important to ensure that the piping and sprinkler layout is carefully coordinated and reviewed by the Authority having Jurisdiction (AHJ). 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.

29. The existing cable/data service to the Dunbar house should remain. If new cable/data service is needed, 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 will be required to determine which option is required and exact requirements. If needed, a new network switch should be installed in the basement of the house to serve the data needs.
Basement

Immediate
1. Provide general cleaning throughout the basement. Vacuum all dust and debris utilizing a vacuum with a HEPA filter.
2. Remove all existing historic artifacts and architectural components stored in the basement for curatorial storage.

Mechanical Systems
3. The existing indoor furnace and air conditioning unit is brand new and was installed in early 2018, therefore it is in good working condition and shall remain as is. All existing ductwork throughout the house should be thoroughly inspected, cleaned, and repaired or replaced as needed. All existing asbestos tape on ductwork shall be fully abated.
4. The humidifier setting should be reviewed to ensure that it is only operating during heating mode when necessary and that the bypass damper connected to the supply duct is closed during cooling mode.
5. The existing condensing unit was installed in late 2003 or early 2004 and is nearing its anticipated useful life. It should be thoroughly inspected by a qualified service technician and cleaned/repaired or replaced as required.

Plumbing Systems
6. Scope floor drain in basement to ensure it is in good working condition. Make repairs or perform required maintenance.

Long Term
7. Hazardous materials abatement: Remove all asbestos-containing materials from basement, as noted in the Hazardous Materials report. Replace any affected ductwork, as required, in kind. Clean any mildew from basement joists and floor framing.
8. Spot repoint brick walls above stone foundation walls.
9. Northeast corner, north foundation wall: Infill missing stone in foundation for full width of wall, as required, and spot repoint stone wall in this area.
10. Remove existing contemporary interior storm windows. Inspect historic window sashes and frames for deterioration. Install new sealant at perimeter of window frames, if required. Install new aluminum-framed interior storm window frames with removable sashes for cleaning and maintenance. Frame shall fit snug to the masonry opening. Install mortar wash or backer rod and caulk, as necessary to completely seal the opening. Reinstall alarm system at windows.
11. Remove existing duct from Window 004. Coordinate duct removal with potential hazardous materials abatement. Restore Window 003 and Infill Window 004 Opening to make them both watertight.

12. Miscellaneous spot repointing throughout basement foundation and interior masonry walls, typical.

13. Infill round duct opening in wall with new bricks. Cut bricks to match existing round opening.

14. Rebuild portion of brick wall under east Window 002 where the brick is deteriorated. Repoint all around window opening and wall below. This may be where the coal chute was once installed.

15. Install hydrophilic profile type of waterproofing system around all basement foundation wall penetrations (new and existing), such as SikaSwell.


17. Install new poured concrete window wells at Windows 005 and 006. Carefully document existing window wells. Excavate for a deeper well with a gravel base and drain. Connect drain to existing sub-grade drain. Install new sub-grade drain, if required. Daylight to east yard.

18. Install new permanent, steel steps with extendable handrails at the floor hatch.

**Structural**

19. Foundation Walls –
   a. Step One: Repoint interior of foundation wall, as required. Install new foundation waterproofing coating at perimeter walls.
   b. Step Two: (If Step One does not adequately address water and moisture infiltration issues, in the future, install Step 2. This is not included in the existing cost estimate). The masonry portion of the foundation walls are affected by mortar washout and the basement has multiple, active leaks indicating a persistent condition of inadequate drainage for the site. The entire stone masonry foundation requires 100% repointing and grout injection. The exterior face of the stone foundation walls below grade should also be coated with a low strength cementitious parging coat. Bentonite waterproofing sheets should be applied to the face of the parging coat with a protection board. An open graded crushed stone rock chimney (backfill) should be installed 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) under sidewalk and paving, and to 85% of a standard proctor in green areas. A perforated footing drain should be incorporated into the crushed stone 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.

20. First Floor Joists – Install Ledgers:
   a. Based on visual observation of the brick interior at the first floor level, the first floor joists are likely rotted where pocketed into the exterior wall.
   b. The first floor joists should have ledgers installed below them to prevent movement. This can be done with a double 2x6 member anchored into the stone masonry portion of the foundation wall just below the joists, along the north and south foundation walls. Shims may be used so that the joists are in solid bearing with the ledger. These ledger members should span across window openings, so as to support the ends of joists currently bearing over window frames.
   c. As an alternative, construct new stud walls along the north and south perimeter walls, bearing on top of the existing concrete portion of the foundation walls. The new walls would support the existing joists near the joist ends and be constructed of modern 2x4, Southern Pine, No. 2 or better. Studs should be spaced approximately at 16 to 18 inches on center; lining up directly with each joist above. The new walls will have a single, treated, bottom plate anchored to the top of the concrete foundation wall. The walls would have a double top plate, shimmed as needed and securely fastened to the joists. If the walls are installed on the concrete foundation wall rather than the basement slab, stud lengths should not exceed 7-feet, and therefore, would not require sheathing or other diagonal bracing.

21. First Floor Joists – Supplemental Framing:
   a. The configuration of the joists that frame around the fireplaces is insufficient for the anticipated loadings. Sistering the existing joists may prove to be difficult due to the interferences with existing MEP.
   b. For the eastern fireplace framing, a more convenient repair would be to construct a wood stud wall adjacent to the existing partition wall running east west. The new wall would support the existing joists at midspan and be constructed of modern 2x4s spaced at 16-inches on center, with a single, treated, bottom plate anchored to the slab and a double top plate, shimmed as needed and securely fastened to the joists. This new wall would not require sheathing or other diagonal bracing.
   c. For the framing around the central fireplace, two joists must be sistered due to condition. Sister members at this location would need to be modern 2x10 Douglas Fir-Larch, No. 1 or better. The existing joists must be sistered for their entire length. The new members must be fitted tight to the existing subfloor and shimmed to bear on the new double 2x6 ledgers at the masonry walls.
22. Framing at Stair to Second Floor:
   a. The framing around the stairs at the second floor should have additional investigation to determine the load path for the framing. This may require some exploratory demolition. It is likely that the second floor joists are supported by the north wall in Room 101, which in turn is supported by the first floor framing.
   b. Remediation of this condition is necessary and will require additional support posts and a beam in the basement, directly below the north wall in Room 101, to support the first floor framing. The new posts will also require small concrete footings.

23. Further Investigation: Additional investigation into the condition of the inaccessible floor framing areas (areas hidden with asbestos boards or in the crawl spaces) is recommended.
   a. Enclosed Back Porch: The conditions of the foundations and the conditions of the joists is unknown. This may require selective exploratory demolition.
      i. The condition of all floor joists should be noted. Deteriorated joists should be replaced or sistered. The condition of the attachment of the floor joists at both ends should also be reviewed. Consider interpretation opportunities for cistern.
      ii. The area where the cistern was noted should be further explored to determine if the cistern is still in place. This will very likely require temporary removal of the porch flooring and reinstallation after documentation. Investigation should include looking for piping, holes through floor, and functionality of the cistern.
      iii. Clean crawlspace of all debris. OHC curator to be included in the documentation and review of all materials found in crawlspace.

24. Infill oversized openings through masonry walls, as needed, to support masonry above. This is approximately 3 locations along the west foundation wall of Room 001 and the west load-bearing interior wall between Rooms 002 and 003.

25. Provide enlarged crawl space access under existing stone door threshold. Reinforce the opening, as required to provide the access. Install removable vented louver with screening. Typically, it is recommended to provide ventilation in a crawl space, but this entire framed area is likely below grade, which would prohibit cross-ventilation. Consider installation of a supply air ventilation into this space to provide a measure of conditioned air.

26. Termite Damage: Monitor existing termite damage in Room 004 for continued decay. At this time, the damage is not enough to warrant tearing out the first floor. If required, sister joists between new east-west frame wall mid-span and the south foundation wall to further support subfloor effected by old termite damage. Continue termite inspections and treatment.
Mechanical
27. A permanent commercial-grade dehumidifier should be considered for installation in the basement and permanently piped to condensate into the floor drain. This would help decrease humidity in the basement during warmer months.

Plumbing
28. Remove the water pump bladder and all related equipment in the basement. The water is foul and is not potable. If sink is retained for interpretation, install new drain to the dry sink and water service to the pitcher pump for service.
29. Determine if there is a need for a mop sink in the basement. Currently, there are no facilities available for cleaning within the house. If so, there may need to be an instantaneous water heater for the sink. Install in Room 002.

Electrical
30. Install new LED lighting throughout the basement to assist with maintenance.
31. Install one convenience receptacle in each of the three major basement rooms.
First Floor

Treatment does not include carpeting, floor rugs, draperies, curtains, upholstery, or furnishings.

Immediate

1. Remove all existing historic artifacts and architectural components from the house that are not part of the building interpretation for off-site curatorial storage.
2. Provide switch plate cover in Front Parlor 100, paint to match wall color.

Long Term

3. Thoroughly clean the entire first floor, including debris inside the fireboxes, carpets, draperies, and curtains. Clean-out contents of Closet 102 with assistance from curator.
4. Restore tile hearths in Front Parlor 100 and Reception Hall 101. This may entail laying tile in new mortar bed and re-grouting. Work should be completed after any first floor stabilization work is completed.
5. Temporarily remove carpeting from southeast corner of the Front Parlor 100 to inspect condition of wood flooring from previous termite damage. Repair/replace in kind, as required, and re-lay carpeting.
6. Provide for some minor refinishing of the interior finishes of Doors 1/100 and 1/101, where damaged and scratched.
7. Consider replacement of the missing doorbell in front Door 1/101, if appropriate.
8. Install new lighting in Stair Closet 102.
9. Lighting: Low lighting levels are a safety concern for visitors, as levels do not meet the foot candles required by code.
   a. Consider the gas light installations. Are these imperative to the operation and interpretation of the house? Are staff trained to use these fixtures? What is the likelihood they will be used in the future? What are the safety implications of using the fixtures or not using the fixtures and not performing maintenance for them?
   b. Install new museum lighting in all rooms on the first and second floor. Consider free-standing lamping or other non-permanent types of fixtures if the architectural authenticity is the goal of OHC. Also, consider retrofitting gas fixtures to electric, in conjunction with the installation of supplemental lighting to raise lighting levels.
   c. Work closely with OHC Architects and interpretive staff to design a system appropriate for the use, interpretation, and visitorship to the house.
   d. Centralized or wireless remote switching may occur in the first floor Closet 102 for all areas of the house for ease.
10. Parlor 100 - Consider removal of alarm door contacts that have damaged the door trim / frame and repairing the door trim.
11. Parlor 100 - The asbestos burner in the fireplace gas heater may require removal. The asbestos burner is very dirty and having the asbestos cleaned by a future museum technician may damage the asbestos integrity. Once the asbestos is removed, the heater and the grate should remain.
12. Parlor 100 - Investigate purpose for light switch on west wall. This may be removed if it is not in use. Patch wall and install wallpaper patch.
13. Reception Hall 101- Research provenance of the free-standing heater in the fireplace. If this is not original, remove heater. This will require repairs to the grate at the fireplace, as the floor settlement has caused the grate to disengage from the frame. This will require some adjustment and perhaps the installation of some brackets or magnets to hold the grate in place.

14. Reception Hall 101- Repair and re-set pocket doors to working condition. Inspect interior of the door pockets to ensure the wall is stable. Cracking in the second floor closet above the south end of the door appears like this wall has settled. This may require bracing in the basement, as well.

15. Stairs to Second Floor: Remove existing handrail lighting and install new LED-strip lighting on a dimmer. Install lighting and emergency lighting at the stairs to improve safety.

16. Remove switches in east wall of Closet 102 that are no longer used or reutilize existing conduit and switch locations for new lighting controls.

17. Remove green carpeting in Closet 102 for inspection of the flooring. Determine if the wallpaper covering the walls and shelving is from the Dunbar time period. If so, conserve the wallpaper. If not, remove wallpaper, as directed.

18. Consider carpeting the stairs, as recommended in earlier furnishing plans.

19. Install new code-compliant handrails on both sides of the stairs to increase safety of the stairway to the second floor. The current handrail does not meet graspability standards and is not historic.

20. Determine if the electric function of the gas/electric lighting fixture in the Dining Room is in functioning condition. Locate the switch. Is this fixture lit during tours for interpretation?

21. Determine why vent in the southwest corner of the pantry was not included in the pantry restoration. Was this outside of the period of significance? What was it serving? Did the duct enter a joist space above the pantry or above the kitchen ceiling? What spaces did this duct serve? With available scoping technologies now, further investigation may yield additional information.

22. Determine age and functionality of abandoned light switches in south wall of the West Pantry 106. If possible, reuse existing locations to install switched to light the basement.

23. For safety considerations, a light should be installed in the West Pantry 106 for access to the basement floor hatch. This room is very dark, making access difficult.

24. Clean mildew from enclosed porch ceiling. Treat the area with fungicide to prevent further growth. Ensure there are no roof leaks.

25. Install a return air duct into the back porch area to improve air circulation.

26. Make repairs, as required, to the three (3) window sashes on the Enclosed Porch. Paint the interior of the sashes.

27. Spot repoint the east brick wall in the Enclosed Porch 107. Repair cracks. Match historic mortar. Replace missing brick in east wall near the north door.

28. Determine if Enclosed Porch 107 brick wall should be plastered. Was this treatment common for 19th Century summer kitchens? It seems that yes, the porch wall was likely plastered, as there may have been a cooking stove along this wall. Look for further documentation of the plaster that was removed in 1987 from this wall.

29. Consider interpreting the Enclosed Porch 107 as a summer kitchen/laundry space by installing an appropriate stove, if the chimney scoping shows positive results for the
installation of a thimble or stovepipe opening where the existing opening remains. Clean out existing stovepipe opening. It is full of brick debris, which has likely resulted from the deterioration and later reconstruction of the upper portion of the chimney.

30. Determine function of row of nails along the east wall of the Enclosed Porch 107 at ceiling height. Remove nails if they date to the 1937 renovation.

31. After inspection and investigation of the crawlspace below the Enclosed Porch 107, if evidence exists for piping for the existing sink display, it shall remain. If there is no evidence for the sink, consider whether it should remain in interpretation.

32. First Floor Accessibility Modifications:
   a. Door 1/107 – Widening of the back door is not required, due to the National Historic Landmark status of the Dunbar House; however, it is 3-inches too narrow to meet the ABA standards. If it is desired by the state to provide access, widening this entry door may be the preferred solution to provide a compliant building entrance.
      i. Carefully dismantle door and trim. Label back side of trim and underside of door with Dunbar information, location, and date removed.
      ii. Prepare the opening to widen the door to meet current ABA standards. Widen door to the north.
      iii. Install new ABA-compliant painted threshold. The threshold may be manufactured of a synthetic, non-cellular PVC wood material to prevent further deterioration.
      iv. Install new ABA-compliant reproduction paneled door and trim to match the existing historic door and trim. Reuse historic hinges, if possible. Install new ABA-compliant handle.
      v. The intent is not for this door to serve as a primary entrance, so replicating the utilitarian character of the existing door, frame, and trim installation is necessary.
   b. Door 1/104 –
      i. Carefully remove existing wood threshold. Label back side of the threshold with Dunbar information, location, and date removed.
      ii. Fabricate new ABA-compliant replacement wood threshold for this location and install.
Second Floor

Long Term

1. Consider painting the picture molding in Paul's Loafing Holt 200. The 1906 Watchword photograph of this space shows it was painted a light color.

2. Investigate cause for vertical cracking in closet in the Loafing Holt 200. This may be due to settlement of the wood-framed walls on the first floor below, or due to slight settlement above the pocket doors. Reinforce or repair, as required, and repair plaster and paint closet.

3. Sewing Room 204: Investigate potential electrical junction box installed in the north wall. This is covered with wallpaper. If not used, remove box, patch plaster wall, and install patch of wallpaper. Remove any wiring to its source.

4. Sewing Room 204: Reattach grass cloth floor covering. Consider installation of a rug or carpeting instead of the grass cloth.


7. Hall 206: The stair railing is 12-inches too low. Install supplemental guard rail for safety. New railing shall be removable without damaging the wood railing.
Attic

Immediate

1. Install light bulbs in all fixtures for lighting in the attic.
2. Inspect and repair electrical service and distribution in the attic. Install cover at open junction box under south roof.
3. Repair existing attic hatch door. Install functional hinges on attic hatch. Install metal guard railing at opening with hold-open for door when it is in the open position. Guard railing to be attached to the floor.

Long Term

4. Roof Framing
   - The roof rafters are inadequate for code required live loads and environmental loadings such as wind and snow, especially in the easternmost portion of the roof. All roof rafters, including the valley, hip, and jack rafters, should be sistered with 2x8 dimensional modern lumber, grade No. 2 or better. New rafters shall be installed in line with each other at the roof ridge and be securely fastened to the existing joists and sill plates. Some jacking may be required where rafters have deflected excessively in the easternmost portion of the roof. Sister rafters should be installed while roof is not deflected.
5. Attic Framing: Clean all mildew from roof rafters, sheathing, and surfaces throughout the attic. Treat all surfaces with a nontoxic fungicide to prevent further growth.
6. Reinstall all loose or missing floor boards.
7. Restore masonry at west masonry wall. Replace bricks that have lost volume of more than 30%. Replace with antique bricks or new bricks to match the hardness and dimensions of the historic bricks. Spot repoint the wall, as required, matching historic mortar.
8. Clean all debris and dust from the attic. This work should be conducted by a curator to identify objects that should be relocated to curatorial storage.
9. Restore attic window sashes, frames, sills, and re-glaze, as required. Replace broken glass in Window 300. Install new sealants at joints between windows and masonry walls.
10. Construct a semi-conditioned attic space.
    a. Sister roof rafters to provide R-30 continuous batt insulation.
    b. Install new gas furnace, per mechanical notes below.
11. Install LED lighting throughout attic.
12. Second Floor and Attic Conditioning: A new central heating and cooling system shall be installed to serve the second floor and provide some attic conditioning. The new furnace unit should be located in the attic, which is proposed to be insulated as part of this work. Ductwork shall be routed from the furnace and distributed throughout the attic to feed supply diffusers located in the ceiling of each of the second floor spaces. A ducted return shall be utilized as well to return air from each space back to the furnace. The placement and style of the supply diffusers and return grilles shall be carefully coordinated with the Architect and Owner to avoid interfering with the historical integrity of the house.
Power, gas piping, condensate piping, and refrigerant lines up to the furnace unit in the attic shall be concealed within the existing fireplace chimney located near the center of the house. The combustion air vents from the new furnace shall enter through the side of the chimney in the attic and extend up through the roof.

The new condensing unit should be located on grade on the north side of the house. The existing pad housing four condensing units for the adjacent buildings shall be expanded to the west to place the new condensing unit. Placement of the units shall be coordinated with manufacturer requirements to ensure proper clearances are provided for air circulation and maintenance. The existing condensing unit for the basement furnace shall also be relocated/replaced in this new location as well to limit visibility from the street. Power and refrigerant lines to the condensing units shall exit the house through the basement foundation wall and shall be routed concealed below grade. Refrigerant piping below grade shall be installed in PVC conduit located below the frost line. Manufacturers requirements shall be followed for installation.

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:

- The existing supply ductwork that is routed up the second floor shall be removed, if possible, or abandoned in place and capped. The existing second floor wall and floor grilles should remain in place for historical appearance and the duct shall be capped below the floor.

- Outdoor design temperature: The ASHRAE outside summer and winter design conditions for Dayton, OH should be used for design purposes.

  - Summer Outdoor Design Temp.: 90.3°F db (1.0%) / 72.8°F wb (MCWB)
  - Winter Outdoor Design Temp.: 2.3°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

*Recommended RH 45% - 55%, Fluctuating temperatures can cause materials to expand and contract rapidly. Ideally, fluctuations should not exceed +/-5% from a set point, each month. Fluctuations should be slow and gradual over weeks and months to adjust for seasonal variations in Ohio. Continue to monitor RH and temperature.382

f. The estimated size required to condition the space is approximately 2-ton cooling and 30,000 BTU heating. 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.

g. A traditional split system consisting of an interior gas furnace and air conditioner and an exterior condensing unit is ideal for this application. If routing the gas line to the attic is an issue, consider an all-electric unit.

h. A new programmable thermostat(s) should be installed on the second floor to monitor the space temperature and control the new system with wireless monitoring and operation capabilities. Exact placement of the thermostat shall be carefully coordinated with the Architect and Owner to provide the best opportunity to maintain the comfort of all spaces on the second floor and to have the least impact on the historical appearance of the house. The low voltage wiring to the thermostat shall be routed concealed within the wall cavity.

Humidity Control: It is believed that by upgrading the HVAC systems in the house that the humidity control should be greatly improved from the current conditions. If additional dehumidification or humidification is desired, this would be provided at the two units, increasing both size and cost of the new unit and requiring replacement of the existing basement unit to accommodate for this change. Humidistats would be installed at each floor level to monitor the relative humidity and make the necessary adjustments.

Alternate - Small-Duct, High-Velocity Heating and Cooling System:

- Typically, small-duct high-velocity (SDVH) systems are best to install in buildings that have frame walls that can be used for chases, because they require a significant amount of duct/piping to be run. The Dunbar House has no vertical frame or cavity walls to run the system, only wood framing at the floor joists.
- High velocity systems can sometimes also present objectionable noise and areas of high air turbulence, if not properly designed and installed.
- Because the ductwork serving the first floor is exposed in the basement and most of the required ducts and grilles are already in place, there does not seem to be a reason to replace the existing system with a high velocity system.
- The SDHV option could be explored to serve the second floor and attic, but again, there is opportunity to run traditional exposed ducts in the attic. If the desire is to have smaller supplies and returns in the second floor ceilings to limit visibility, this could potentially be explored for the second floor, but the system will be more costly and will likely require several more openings in the ceilings than a traditional system. It is also sometimes difficult to get the desired quantity of return air with these smaller openings, so the return air grilles are often larger than the supplies anyway.
• However, an SDHV system may present one significant advantage – SDHV systems can remove up to 30 percent more humidity than traditional systems. This type of system would require engineering design to ensure it would be sufficient to provide the required air flow from a ceiling situation only, as it is not possible for such a system to be installed through side walls or floors.

13. Geothermal Heat Pump System Option: As an alternative option to the gas furnaces, a geothermal heat pump system could be explored, however the initial cost to install the system would be significantly higher and the installation would be more disruptive to the house, the site, and potential archeological resources, than that of the traditional split system option noted above. For this reason, this solution is not recommended.
Barn

IMMEDIATE

1. Perform a pest inspection. There appeared to be a potential ant infestation in the wood wall framing in the southeast corner of the second floor.

LONG TERM

2. Restore windows and sashes. Work includes epoxy repairs, where appropriate. For larger areas of deterioration, replace wood components to match the existing sash components in overall dimension and profile. Use compatible, exterior-grade wood. Treat all new wood replacement components with wood preservative, oil-based primer, and two finish coats of paint. Consider removal of the interior Lexan glazing and installation of fixed security bars. Total 10 window openings.

3. Miscellaneous locations on the exterior of the barn with visible wood rot should be repaired or replaced. Prep, prime, and paint exterior of barn, per the 2001 historic paint analysis recommendations.

4. The gutters on the east and west roof eaves appear to be sagging or rotating outward and may have some broken connections. Repair and the gutters and straighten as necessary. Review sizing of gutters to ensure they are large enough to gather rainwater. Replace with larger diameter gutters to match the existing gutters, if required.

5. Remove vines from the exterior of the barn. Prevent them from continuing to grow. Coordinate with Landscape Treatment Recommendations.

6. Trim and artifacts stored in the rafters of the barn should be carefully sorted through by a curator and historic architect to determine if any of the material is from the house. There appears to be some old picture molding, double-hung window jambs with pulleys, stovepipe flue, and some picture frame moldings.

7. Install supplemental horizontal framing at guardrail at north side of the stair opening.

8. Investigate original location of the second floor grain bin and potential chutes to the first floor. Investigate for first floor chute at second floor to determine if it was used for hay or grain.

Structural

9. Cracks and spalls in the existing concrete slab on grade and cracks in the perimeter curb should be grout injected and patch repaired.

10. The sill plate along the perimeter of the barn is not adequately fastened to the curb. It is recommended that the sill plate be anchored to the curb at a 6-foot maximum spacing. This may be done by drilling through the plate and into the curb. Threaded rod anchors
would then be epoxied into the curb, extending above the sill, and fitted with oversized plate washers and secured with nuts.

11. The limestone step at the east entrance to the barn presents a tripping hazard and should be mortared back together. Pin, if required.

12. The connection of the west stair stringer to the hay loft framing joist is inadequate. It is recommended that wood blocking be used to reinforce the connection.

13. A conservative analysis of the hay loft framing joists based on the visible condition of the members and an estimate of the lumber grade, shows that the live load capacity would be approximately 8.6 psf. Rather than increase the capacity of the joists, it is more reasonable to restrict the size of tour groups allowed upstairs. Based on the calculated joist capacity, a tour size of limit of 8 people would be appropriate. It is recommended that the hay loft not be used for any sort of material storage.

14. The configuration of the joist framing around the stairs does not have double trimmer joists, as is typical in modern construction. The layout of the stairs is perpendicular to the direction of the joists, so the load for several joists must be supported by the trimmer joists on either side of the stairs. These two joists have a reduced capacity compared to other joists for the hay loft. These two joists should have posts added near the corners of the stair opening. Modern 4x4 wood posts would be located where the header joist at the west side of the opening frames into the trimmer joists. The posts will need to be anchored to the existing concrete slab below the existing flooring.

15. The sill plates at the roof eave on the east and west elevations are deflecting downward. This is partially due to the roof loading and partially due to the method of sill repair that was done on the west side. It is recommended that studs be added at a 2-foot spacing to distribute the roof loading among other framing members.

16. The roof rafters are inadequate for code required live loads and environmental loadings such as wind and snow. All roof rafters should be sistered with 2x8 dimensional modern lumber, grade No. 2 or better. New rafters shall be installed in line with each other at the roof ridge and be securely fastened to the existing sill plates. The five rafters that have previously been repaired are not exempt from these recommendations. The multiple split and broken rafters that were not repaired show that the existing members are inadequate, and repairs in kind would also be inadequate.

**Electrical**

17. Install new LED jelly jar-style light fixtures throughout the barn to provide adequate illumination.

18. Install new general purpose receptacles throughout the barn to provide adequate coverage and to support any new State-provided equipment.
19. Install new electrical sub-panel for barn service.

**Fire Suppression System**

20. Consider installation of a dry pipe sprinkler system throughout the barn. This is discussed in the General Notes.

**Site Lighting**

21. It is recommended that the existing pole mounted fixture at the northwest end of the site, adjacent to the barn, be removed in its entirety (including the base). New security lighting will need to be provided for the entire site and exterior of the structures.
**TREATMENT RECOMMENDATIONS**

**DAYTON, OHIO**

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**CULTURAL LANDSCAPE AND HISTORIC STRUCTURES REPORT**

**PAUL LAURENCE DUNBAR HOUSE**

**DAYTON AVIATION HERITAGE NATIONAL HISTORICAL PARK**

**TREATMENT RECOMMENDATIONS**

**DAYTON, OHIO**

**GENERAL SITE FIRE AND SECURITY**

**Mitigates**
- A. Protect all existing plumbing for leaks or deterioration and repair, as needed.
- B. Verify functionality of the existing fire alarm system to ensure all components are fully operational.
- C. All new electrical systems shall be designed in accordance with the National Electrical Code (NEC) and approved by the local electrical inspection authority.
- D. Install a new fire protection system for the house and barn. The new system shall be designed and installed in accordance with the National Fire Protection Association (NFPA) standards.
- E. The existing electrical service shall be increased to meet the demand of the new system.
- F. The existing gas service shall be increased to meet the demand of the new furnace.
- G. The existing water supply system shall be increased to meet the demand of the new system.

**LONG TERM ELECTRICAL**

- A. Provide a new electrical service to the house, barn, and adjacent buildings.
- B. Install new circuit breaker panels in the house and barn.
- C. Upgrade the existing electrical service to meet the NEC requirements.
- D. Install new electrical conduits for the new lighting and receptacle systems.

**LONG TERM PLUMBING**

- A. Install new plumbing for the new water supply system.
- B. Install new drainage systems for the new water supply system.
- C. Install new sanitary drainage systems for the new water supply system.

**LONG TERM MECHANICAL**

- A. Install a new heating and cooling system for the house and barn.
- B. Install new ventilation systems for the house and barn.
- C. Install new refrigeration systems for the house and barn.

**LONG TERM PROTECTION SYSTEMS**

- A. Install new smoke detectors and fire alarms in the house and barn.
- B. Install new security systems in the house and barn.
- C. Install new intrusion detection systems in the house and barn.

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**TREATMENT RECOMMENDATIONS**

**DAYTON, OHIO**

**GENERAL SITE FIRE AND SECURITY**

**Mitigates**
- A. Protect all existing plumbing for leaks or deterioration and repair, as needed.
- B. Verify functionality of the existing fire alarm system to ensure all components are fully operational.
- C. All new electrical systems shall be designed in accordance with the National Electrical Code (NEC) and approved by the local electrical inspection authority.
- D. Install a new fire protection system for the house and barn. The new system shall be designed and installed in accordance with the National Fire Protection Association (NFPA) standards.
- E. The existing electrical service shall be increased to meet the demand of the new system.
- F. The existing gas service shall be increased to meet the demand of the new furnace.
- G. The existing water supply system shall be increased to meet the demand of the new system.

**LONG TERM ELECTRICAL**

- A. Provide a new electrical service to the house, barn, and adjacent buildings.
- B. Install new circuit breaker panels in the house and barn.
- C. Upgrade the existing electrical service to meet the NEC requirements.
- D. Install new electrical conduits for the new lighting and receptacle systems.

**LONG TERM PLUMBING**

- A. Install new plumbing for the new water supply system.
- B. Install new drainage systems for the new water supply system.
- C. Install new sanitary drainage systems for the new water supply system.

**LONG TERM MECHANICAL**

- A. Install a new heating and cooling system for the house and barn.
- B. Install new ventilation systems for the house and barn.
- C. Install new refrigeration systems for the house and barn.

**LONG TERM PROTECTION SYSTEMS**

- A. Install new smoke detectors and fire alarms in the house and barn.
- B. Install new security systems in the house and barn.
- C. Install new intrusion detection systems in the house and barn.

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**TREATMENT RECOMMENDATIONS**

**DAYTON, OHIO**

**GENERAL SITE FIRE AND SECURITY**

**Mitigates**
- A. Protect all existing plumbing for leaks or deterioration and repair, as needed.
- B. Verify functionality of the existing fire alarm system to ensure all components are fully operational.
- C. All new electrical systems shall be designed in accordance with the National Electrical Code (NEC) and approved by the local electrical inspection authority.
- D. Install a new fire protection system for the house and barn. The new system shall be designed and installed in accordance with the National Fire Protection Association (NFPA) standards.
- E. The existing electrical service shall be increased to meet the demand of the new system.
- F. The existing gas service shall be increased to meet the demand of the new furnace.
- G. The existing water supply system shall be increased to meet the demand of the new system.

**LONG TERM ELECTRICAL**

- A. Provide a new electrical service to the house, barn, and adjacent buildings.
- B. Install new circuit breaker panels in the house and barn.
- C. Upgrade the existing electrical service to meet the NEC requirements.
- D. Install new electrical conduits for the new lighting and receptacle systems.

**LONG TERM PLUMBING**

- A. Install new plumbing for the new water supply system.
- B. Install new drainage systems for the new water supply system.
- C. Install new sanitary drainage systems for the new water supply system.

**LONG TERM MECHANICAL**

- A. Install a new heating and cooling system for the house and barn.
- B. Install new ventilation systems for the house and barn.
- C. Install new refrigeration systems for the house and barn.

**LONG TERM PROTECTION SYSTEMS**

- A. Install new smoke detectors and fire alarms in the house and barn.
- B. Install new security systems in the house and barn.
- C. Install new intrusion detection systems in the house and barn.

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**BARN - ARCHITECTURAL**

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**GENERAL NOTES**

1. All work shall be in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties: A Manual for Federally Assisted Projects, and any requirements of the National Park Service District Archeologist.

2. All work shall be carried out in accordance with the terms and conditions of the contract and the approved plans and specifications.

3. All work shall be in accordance with the approved plans and specifications.

**MINORIS FIRST-FLOOR RECOMMENDATIONS**

1. Provide shear panel coating throughout the first floor, vacuum all dust and debris utilizing a vacuum with HEPA filtration.

2. Provide drywall/cement board in front first floor. Paint to match wall color.

**LONG-TERM FIRST-FLOOR RECOMMENDATIONS**

1. Provide anchoring system to prevent future cracking in the second-floor closet area.

2. Ensure the wall is stable. Cracking in the second-floor closet area.

3. Install a return air duct into the back porch area to improve indoor air quality.

4. Print and install the manufacturer name from the existing pipe in the first-floor HVAC system.

5. Replace missing doorbell at door 1/101.

6. Replace missing doorbell at door 1/104.

7. Ensure the wall is stable. Cracking in the second-floor closet area.

8. Paint the walls and ceiling to match the wall color.

9. Ensure there are no roof leaks.

10. Clean and dust all areas.

11. Provide switchplate cover in front parlor.

12. Install new inconspicuous light in west pantry.

13. Replace storm windows with interior storm windows.

14. Stain and varnish all floors to meet current ABA standards.

15. Repair and replace missing door and trim.

16. Install new LED strip lighting in the dining room.

17. Ensure the wall is stable. Cracking in the second-floor closet area.

18. Install new inconspicuous light in the front parlor.

19. Ensure the wall is stable. Cracking in the second-floor closet area.

20. Ensure there are no roof leaks.

21. Clean and dust all areas.

22. Provide switchplate cover in front parlor.

**FLOOR PLAN KEY NOTES**

- **WOOD WALL**
- **STONE WALL**
- **BRICK WALL**
- **CELLULAR PVC WOOD MATERIAL**
- **DRAWING KEY NOTES**
- **STORAGE**
- **CONCRETE**
- **DOOR**
- **STONE WALL**
- **ROOF**
- **WINDOW**
- **CONCRETE**
- **DOOR**
- **STONE WALL**
- **DOOR**
- **STONE WALL**
- **DOOR**
- **STONE WALL**
- **DOOR**
- **STONE WALL**

**TREATMENT RECOMMENDATIONS**

1. Install new hardware throughout the first floor to improve safety.

2. Install new inconspicuous light in kitchen and back porch.

3. Install new inconspicuous light in the dining room.

4. Install new inconspicuous light in the west pantry.

5. Install new inconspicuous light in the front parlor.

6. Install new inconspicuous light in the reception hall.

7. Install new inconspicuous light in the dining room.

8. Install new inconspicuous light in the kitchen.


10. Install new inconspicuous light in the front parlor.

11. Install new inconspicuous light in the reception hall.

12. Install new inconspicuous light in the dining room.

13. Install new inconspicuous light in the kitchen.


15. Install new inconspicuous light in the front parlor.

16. Install new inconspicuous light in the reception hall.

17. Install new inconspicuous light in the dining room.

18. Install new inconspicuous light in the kitchen.

19. Install new inconspicuous light in the back porch.

20. Install new inconspicuous light in the front parlor.

21. Install new inconspicuous light in the reception hall.

22. Install new inconspicuous light in the dining room.

23. Install new inconspicuous light in the kitchen.

24. Install new inconspicuous light in the back porch.

25. Install new inconspicuous light in the front parlor.

26. Install new inconspicuous light in the reception hall.

27. Install new inconspicuous light in the dining room.

28. Install new inconspicuous light in the kitchen.

29. Install new inconspicuous light in the back porch.

30. Install new inconspicuous light in the front parlor.

31. Install new inconspicuous light in the reception hall.

32. Install new inconspicuous light in the dining room.

33. Install new inconspicuous light in the kitchen.

34. Install new inconspicuous light in the back porch.

35. Install new inconspicuous light in the front parlor.

36. Install new inconspicuous light in the reception hall.

37. Install new inconspicuous light in the dining room.

38. Install new inconspicuous light in the kitchen.

39. Install new inconspicuous light in the back porch.

40. Install new inconspicuous light in the front parlor.

41. Install new inconspicuous light in the reception hall.

42. Install new inconspicuous light in the dining room.

43. Install new inconspicuous light in the kitchen.

44. Install new inconspicuous light in the back porch.

45. Install new inconspicuous light in the front parlor.

46. Install new inconspicuous light in the reception hall.
Treatment Main House Second Floor Plan

SECOND FLOOR PLANS KEY NOTES

GENERAL NOTES
A. ALL WORK SHALL BE IN ACCORDANCE WITH THE SECRETARY OF THE INTERIOR’S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES SPECIFICALLY, REHABILITATION. NON-STANDARD ALTERATIONS TO EXISTING STRUCTURE OR ENVIRONMENTAL REMEDIAL ACTIONS INCLUDING THE USE OF SOME MATERIALS MAY REQUIRE ADVISORY COMMISSION CONSENT.
B. MATERIALS TO BE USED SHOULD BE OF SIMILAR TYPE AND QUALITY TO EXISTING MATERIALS AND APPEAR AS ORIGINAL.
C. ALL EXTERIOR Portable APPARATUS, SUCH AS AIR COMPRESSORS OR PUMPS, SHALL BE STORED INSIDE THE BUILDING.
D. USE OF ALL HAZARDOUS MATERIALS MUST BE IN ACCORDANCE WITH THE LOCAL AIR, WATER, AND SOLID WASTE REGULATIONS.

IMMEDIATE SECOND FLOOR RECOMMENDATIONS
1. PROCEED GENERALLY THROUGHOUT THE SECOND FLOOR, VACUUM ALL EAVES W/SMALL VACUUM, UTILIZING A VACUUM WITH AS MANY FILTERS AS POSSIBLE.

LONG-TERM SECOND FLOOR RECOMMENDATIONS
1. OF THE SPACE ABOVE THE ROOF OVER THE ATTIC W/ROOFING, EXCISE THE ATTIC HOLES 7-15. THE REMAINING HOLES MAY BE DUE TO SETTLEMENT OF THE ROOF. BRICKS OR BRICKS ON THE ROOF, WHEN EXPOSED OR EXPOSED TO THE ELEMENTS, MAY BE REPAIRED OR REPLACED. AS REQUIRED, REPAIR BRICK LEAKS AND RAIN DRAINAGE PROBLEMS.
2. BILATERAL HORIZONTAL SdüFFING IN A CLOSET IN THE ATTIC IS DESIRABLE. A CLOSET SHOULD BE COVERED OR COVERED WITH SHALLOW.await
3. INVESTIGATE MOMENTAL CRACKING ON THE ROOF OVER THE ATTIC. THE ATTIC WOULD BE REPAIRED OR REPLACED, AS REQUIRED, REPAIR BRICK LEAKS AND RAIN DRAINAGE PROBLEMS.
4. REFURBISH THE ROOF COATING, EXCEPT IN AREAS OF THE ROOF WHERE DAMAGE COULD OCCUR.
5. BILATERAL HORIZONTAL SdüFFING IN A CLOSET IN THE ATTIC IS DESIRABLE. A CLOSET SHOULD BE COVERED OR COVERED WITH SHALLOW.await
6. INVESTIGATE MOMENTAL CRACKING ON THE ROOF OVER THE ATTIC. THE ATTIC WOULD BE REPAIRED OR REPLACED, AS REQUIRED, REPAIR BRICK LEAKS AND RAIN DRAINAGE PROBLEMS.
7. BATHROOMS, PAINTING TO REMOVE LEAKED BORDERS AND LEAKED BORDERS.
8. HOLLOW SPACE,HIGHLY RECOMMENDED TO REMOVE THE WALLPAPER TO EXPOSE THE MASONRY. AS REQUIRED, REPAIR BRICK LEAKS AND RAIN DRAINAGE PROBLEMS.
9. INVESTIGATE MOMENTAL CRACKING ON THE ROOF OVER THE ATTIC. THE ATTIC WOULD BE REPAIRED OR REPLACED, AS REQUIRED, REPAIR BRICK LEAKS AND RAIN DRAINAGE PROBLEMS.
10. INSTALL NEW CODE-COMPLIANT HARDWARE ON BOTH SIDES OF THE STAIRS TO INCREASE SAFETY OF THE STAIRWAY TO THE SECOND FLOOR. REMOVE EXISTING NON-HISTORIC HARDWARE.
11. INSTALL LED STRIP LIGHTING UNDER HANDRAIL. INSTALL A NEW LED STRIP LIGHTING AT THE TOP OF THE STAIRS TO IMPROVE SAFETY.
12. INSTALL FIRE EXTINGUISHERS IN THE ATTIC AT A DISTANCE BETWEEN 75 FEET OF REACH THROUGHOUT THE FIRST FLOOR.
13. INSTALL NEW WIRELESS THERMOSTAT.

SECOND FLOOR PLANS KEY NOTES

A. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
B. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
C. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
D. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
E. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
F. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
G. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
H. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
I. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
J. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
K. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
L. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
M. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
N. NO EXISTING MELTING TRASH ON STAIRS. INSTALL HANGER AT ATTIC WALL. INSTALL PARTITION ATTACHED TO WALL AND LINING LEADING TO ATTIC.
GENERAL NOTES
A. All work shall be in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, which can be found at: https://www.nps.gov/tps/standards/historic/index.htm.
B. Replacement working drawings shall be coordinated externally with equipment as noted in the historic materials report. Replace any affected equipment, as required.
C. Repair all masonry, metal, mechanical, or architectural components stored in the attic from the house and store dry.

ATTIC FLOOR PLANS KEY NOTES

REFERENCE DRAWING

DRAWING KEY NOTES

DRAWING KEY

DOOR NUMBER

ROOM NUMBER

STONE WALL

CONCRETE

WOOD WALL

BRICK WALL

ATTIC FLOOR PLANS

EAVES VENT

EXISTING BASEMENT FURNACE VENT

RISER FOR FIRE SUPPRESSION SYSTEM

EXISTING VENT STACK

OPTIONAL LOCATION FOR FIRE SUPPRESSION RISER

REFERENCE DRAWING

FLOOR PLAN KEY

DRAWING KEY NOTES

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Treatment Main House North Elevation
MAIN HOUSE EXTERIOR KEY NOTES

GENERAL NOTES
1. KEEP WORK IN ACCORDANCE WITH THE SPECIFICATIONS OF THE INTERIOR DESIGNER FOR THE PROJECT. ALTERATIONS TO MASONRY TEXTURE WILL BE PLANNED CONSIDERATION TO MATCH THE HISTORIC FABRIC. NO ALTERATIONS TO MASONRY COLOR SHOULD BE MADE.
2. REMOVE AND REPLACE MASONRY AS REQUIRED TO COMPLETELY REMOVE THE SEALANT. INSTALL NEW, COMPATIBLE MORTAR. TEST BOTH BED AND STRETCH MORTAR. UTILIZE THIS MORTAR ANALYSIS FOR FUTURE USE.
3. MAINTAIN EXTERIOR STORM WINDOWS ON THE BASEMENT 001 AND 002 WYTHE OF BRICK HERE COULD BE REMOVED AND RESTACKED FLUSH WITH THE EXISTING OUTSIDE WALL. PRIME ALL AREAS OF EXPOSED WOOD. REMOVE ANY TEMPORARY INSTALLATION OR CONSTRUCTION SEALS.

LONG TERM EXTERIOR RECOMMENDATIONS

FOUNDATION
1. INSTALL INTERIOR STORMS ON ALL WINDOWS, WITH UV PROTECTION, AS REQUIRED TO COMPLETELY REMOVE THE SEALANT. INSTALL NEW, COMPATIBLE MORTAR. TEST BOTH BED AND STRETCH MORTAR. UTILIZE THIS MORTAR ANALYSIS FOR FUTURE USE.
2. REMOVE AND REPLACE HEADER BRICKS. DETERIORATED HEADER BRICKS SHALL REMAIN IN PLACE, AS WELL AS THE CONDITION OF THE CHIMNEY CAPS. REPAIRS SHOULD BE BASED ON REQUIREMENTS, A NEW HEADER WILL BE SOLIDLY SEATED ON THE STONE.
3. REMOVE ALL INCOMPATIBLE SEALANTS FROM THE LIMESTONE WATER TABLE EXTERIOR RECOMMENDATIONS.
4. BOND REPOINTING IS RECOMMENDED. TREATMENT MAIN HOUSE EAST ELEVATION
5. REMOVE ALL INCOMPATIBLE SEALANTS FROM THE LIMESTONE WATER TABLE EXTERIOR RECOMMENDATIONS.
6. INSTALL SEALANT AT ALL PENETRATIONS THROUGH FOUNDATION WALL.

EXTENSIONS
1. ALL EXTERIOR PAINT IS ASSUMED TO CONTAIN LEAD. CONTRACTORS MUST PROVIDE PROPER TRAINING AND SAFETY MEASURES FOR WORKERS.
2. REPAIRS TO EXTERIOR WINDOWS ARE REQUIRED TO COMPLETELY REMOVE THE SEALANT. INSTALL NEW, COMPATIBLE MORTAR. TEST BOTH BED AND STRETCH MORTAR. UTILIZE THIS MORTAR ANALYSIS FOR FUTURE USE.
3. REMOVE ALL INCOMPATIBLE SEALANTS FROM THE LIMESTONE WATER TABLE EXTERIOR RECOMMENDATIONS.

HISTORIC BRICK TEXTURE. IF BRICKS ARE TOO DETERIORATED, REPLACE WITH ANTIQUE SALVAGED BRICK. COORDINATE WITH NEED FOR ARCHEOLOGICAL MONITORING IS REQUIRED FOR ALL EXCAVATIONS, INSIDE AND OUTSIDE OF THE STRUCTURE.
4. HELICAL ANCHORS SHOULD BE INSTALLED AT THE AREA OF BRICK BULGE.
5. REMOVE AND REPLACE HEADER BRICKS.
6. REMOVE AND REPLACE HEADER BRICKS. DETERIORATED HEADER BRICKS SHALL REMAIN IN PLACE, AS WELL AS THE CONDITION OF THE CHIMNEY CAPS. REPAIRS SHOULD BE BASED ON REQUIREMENTS, A NEW HEADER WILL BE SOLIDLY SEATED ON THE STONE.
7. MATERIALS SHOULD BE SELECTED TO MATCH THE HISTORIC FABRIC. CHIMNEY REPAIRS SHOULD ONLY STABILIZE THE WALL FROM FURTHER BULGING. AS A LAST RESORT, A COMPLIANT RAMP AT THE WEST END OF THE FRONT PORCH SHOULD BE LAUNDERED AWAY FROM THE HOUSE, TO COMPLETELY REMOVE THE SEALANT. INSTALL NEW, COMPATIBLE MORTAR. TEST BOTH BED AND STRETCH MORTAR.
8. INSTALL INTERIOR STORMS ON ALL WINDOWS, WITH UV PROTECTION, AS REQUIRED TO COMPLETELY REMOVE THE SEALANT. INSTALL NEW, COMPATIBLE MORTAR. TEST BOTH BED AND STRETCH MORTAR. UTILIZE THIS MORTAR ANALYSIS FOR FUTURE USE.
9. INSTALL INTERIOR STORMS ON ALL WINDOWS, WITH UV PROTECTION, AS REQUIRED TO COMPLETELY REMOVE THE SEALANT. INSTALL NEW, COMPATIBLE MORTAR. TEST BOTH BED AND STRETCH MORTAR. UTILIZE THIS MORTAR ANALYSIS FOR FUTURE USE.

IMMEDIATE EXTERIOR RECOMMENDATIONS
1. REPAIR ROOF LEAK AT THE REAR PORCH, NORTH END. DURING THE AUGUST 2016 INVESTIGATION, RAIN WAS SEEN RUNNING DOWN THE SOUTH EAVE AND ENTERING THE BASEMENT, NORTHEAST CORNER.
2. INSTALL SEALANT AT ALL PENETRATIONS THROUGH FOUNDATION WALL.
3. REMOVE ALL INCOMPATIBLE SEALANTS FROM THE LIMESTONE WATER TABLE EXTERIOR RECOMMENDATIONS.

15. IF DETERIORATION OF THE FRONT PORCH, THE PERIMETER STONES DO NOT APPEAR TO HAVE SUFFICIENT BAKING. IT IS RECOMMENDED TO INSTALL A NEW LAMINATE WITH SPECIAL STAINS AND SMALL OPENINGS IN THE ROOF AT THE WEST CHIMNEY. IT IS HIGHLY CONSIDERED TO INSTALL A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

16. THE EXTERIOR BRICK MASONRY SHOULD BE 80% REPOINTED. SELECTED DETAIL WARKING ON THE SOUTH ELEVATION. THIS MAY BE A FLASHING ISSUE UNDER THE SECOND FLOOR WINDOW.

17. REMOVE AND REPLACE HEADER BRICKS. IF THE WINDOW SASHES. REPLACE DETERIORATED COMPONENTS, IN KIN.

18. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

19. REMOVED AND REPLACED. DETERIORATED HEADER BRICKS SHALL REMAIN IN PLACE, BUT NOT ATTEMPT TO REFURBISH. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

20. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

21. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

22. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

23. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

24. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

25. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

26. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

27. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

28. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.

29. CONSIDER INSTALLATION OF A LEAD DERIVATION AT THE WEST END OF THE FRONT PORCH TO INCREASE THE SECURITY OF THE HOUSE. CONSIDER INSTALLATION OF SECURITY BARS ON INTERIOR FACE OF THE DOOR OPENING.
**MAIN HOUSE EXTERIOR KEY NOTES**

**IMMEDIATE EXTERIOR RECOMMENDATIONS**

1. Repair roof leak at the rear porch. North side during the August 2018 investigation, rain was dripping down the interior brick wall, just north of the north door.

**LONG TERM EXTERIOR RECOMMENDATIONS**

1. Replace all windows along the foundation wall, from the second floor. The windows along the foundation wall, from the second floor, are assumed to contain lead. Contractors must follow all lead regulations.

**GENERAL NOTE**

- The work shall be in accordance with the standards of the exterior of the dwelling, as specified in the Secretary of the Interior's Standards of Treatment of Historic Properties, 36 FR 9906, August 17, 1971.

- Excavation work shall be reversible, without causing permanent damage or alteration of historic fabric.

- Archeological monitoring is required for all excavation work. The interior and exterior grounds shall be maintained to the extent possible.

- No work shall be performed that is inconsistent with the recommendations of this report.

- All work shall be in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, 36 FR 9906, August 17, 1971. Excavation work shall be reversible, without causing permanent damage or alteration of historic fabric.

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- Archeological monitoring is required for all excavation work. The interior and exterior grounds shall be maintained to the extent possible.

- No work shall be performed that is inconsistent with the recommendations of this report.

- All work shall be in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, 36 FR 9906, August 17, 1971.

**TERMINAL EXTERIOR RECOMMENDATIONS**

1. Replace all windows along the foundation wall, from the second floor. The windows along the foundation wall, from the second floor, are assumed to contain lead. Contractors must follow all lead regulations.

2. Replace all windows along the foundation wall, from the second floor. The windows along the foundation wall, from the second floor, are assumed to contain lead. Contractors must follow all lead regulations.

3. Replace all windows along the foundation wall, from the second floor. The windows along the foundation wall, from the second floor, are assumed to contain lead. Contractors must follow all lead regulations.

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**EXTERIOR WALLS**

1. Replace all windows along the foundation wall, from the second floor. The windows along the foundation wall, from the second floor, are assumed to contain lead. Contractors must follow all lead regulations.

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1. Treatment Barn First Floor Plan

2. Treatment Barn Second Floor Plan
13. Trim and artifacts stored in the rafters of the barn should be reviewed sizing of gutters to ensure they are large enough to gain miscellaneous locations on the exterior of the barn with vis.

14. Existing sill plates. The five rafters that have previously been through the barn. This is discussed in the general notes.

15. Through the barn. This is discussed in the general notes.

16. Existig stone tread into the east barn entrance. Pin.

17. With nuts.

18. Staff and into the curb. Install threaded rod anchored Epoxyed.


20. Anchors sill plate to the existing concrete curb at a 6 foot.


22. 2001 historic paint analysis.

23. Site all roof rafters with 2x8 dimensional modern lumber. Grade No. 2 or better. New rafters will need to be anchored to the

24. Existing concrete slab below the existing flooring.

25. Performed a pest inspection. There appeared to be potential ant infestation in this area. Used for any sort of material storage.

26. Consider installation of a dry pipe sprinkler system throughout the barn. This is disclosed in the preceding notes.

27. Treatment recommendations.
DRAWING KEY NOTES

1..Painting/Peel Inspection. There appears to be potential ant infestation in the wood shall frame in the northeast corner of the second floor.

LONG TERM RECOMMENDATIONS

1. Repair any loose connections on the exterior of the barn. The roof gutters should be repaired or replaced.
2. Remove vines from the exterior of the barn. Prevent them from growing in the future.
3. Install new general purpose receptacles throughout the barn.
4. Install new LED jelly jar light fixtures throughout the barn.
5. Install studs at a 2" on center spacing on the east and west elevations.
6. Install 4x4 wood posts at the corners of the stair opening.
7. Install supplemental horizontal framing at guardrail at northeast.
8. Use compatible, exterior material is from the house.
9. Install new general purpose receptacles throughout the barn.
10. Install 4x4 wood posts at the corners of the stair opening.
11. Install new general purpose receptacles throughout the barn.
12. Install new LED jelly jar light fixtures throughout the barn.
13. Install studs at a 2" on center spacing on the east and west elevations.
14. Install new general purpose receptacles throughout the barn.
15. Install new general purpose receptacles throughout the barn.
16. Install new general purpose receptacles throughout the barn.

MISCELLANEOUS LOCATIONS ON THE EXTERIOR OF THE BARN WITH VISIBILITY TO THE PUBLIC:

1. Where possible, all load-bearing walls shall be repaired.
2. All load-bearing walls shall be repaired.
3. All load-bearing walls shall be repaired.
4. All load-bearing walls shall be repaired.
5. All load-bearing walls shall be repaired.
6. All load-bearing walls shall be repaired.
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14. All load-bearing walls shall be repaired.
15. All load-bearing walls shall be repaired.
16. All load-bearing walls shall be repaired.
17. All load-bearing walls shall be repaired.
18. All load-bearing walls shall be repaired.
19. All load-bearing walls shall be repaired.
20. All load-bearing walls shall be repaired.

FLOOR LOAD CAPACITY:

1. Calculated joist capacity, a load of 5000 pounds per square foot shall be applied to the existing members.
2. Calculated joist capacity, a load of 5000 pounds per square foot shall be applied to the existing members.
3. Calculated joist capacity, a load of 5000 pounds per square foot shall be applied to the existing members.
4. Calculated joist capacity, a load of 5000 pounds per square foot shall be applied to the existing members.
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20. Calculated joist capacity, a load of 5000 pounds per square foot shall be applied to the existing members.

TREATMENT RECOMMENDATIONS

1. In the stairwells, there are potential connections to be repaired. Any infestation in the wood shall frame in the northeast corner of the second floor.
2. Any infestation in the wood shall frame in the northeast corner of the second floor.
3. Any infestation in the wood shall frame in the northeast corner of the second floor.
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20. Any infestation in the wood shall frame in the northeast corner of the second floor.
BARN FLOOR PLANS AND ELEVATION KEY NOTES

GENERAL NOTES
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE SECRETARY OF THE INTERIOR'S STANDARDS FOR THE ARCHITECTURAL PRESERVATION OF HISTORIC PROPERTY. ALL PROJECTS PROPOSED WERE RECOMMENDED FOR HISTORIC DISTRICT STATUS. FOR FURTHER INFORMATION, VISIT THE WEBSITE AT WWW.HISTORICSAVINGS.ORG.

2. ALL WORKSHOPS OF THE BARN SHOWN ON THE ELEVATION SHEETS OF THE MUSEUM AND ON THE EXTERIOR OF THE BARN WERE DETERMINED TO BE IN CONFORMITY TO THE REQUIREMENTS OF THE NATIONAL HISTORIC PRESERVATION ACT. ALL WORKSHOPS SHOWN ON THIS SHEET ARE IN ACCORDANCE WITH THE NATIONAL HISTORIC PRESERVATION ACT.

3. STAIN AND PAINT RECOMMENDATIONS: THE SILL PLATES AND INTO THE CURB. INSTALL THREADED ROD ANCHORS EPOXYED TO THE SILL, AND FITTED WITH OVERSIZED PLATE WASHERS AND SECURED TO SUPPORT ANY NEW STATE.

4. INSTALL NEW GENERAL PURPOSE RECEPTACLES THROUGHOUT THE BARN. RESTORE WINDOWS AND SASHES. WORK INCLUDES EPOXY REPAIRS, WHEAR TREATMENT OF HISTORIC PROPERTIES, SPECIFICALLY, REHABILITATION. WHERE POSSIBLE, ALL銷售 ENERGENCY LIGHTS AND YOU CAN'T MEET THE REQUIREMENTS OF THE NATIONAL HISTORIC PRESERVATION ACT.

5. TOTAL 10 WINDOW OPENINGS.

6. INSTALL WOOD BLOCKING AT THE WEST STAIR STRINGER TO REINFORCE THE FRAMING in THE SOUTHEAST CORNER OF THE SECOND FLOOR.

7. INSTALL STUDS AT A 2' 1/2" SPACING ON THE EAST AND WEST ELEVATIONS TO SUPPORT ANY NEW STATE.

8. INSTALL SUPPLEMENTAL HORIZONTAL FRAMING AT GUARDRAIL AT NORTH TREATMENT FOR THE WOOD WALL.

9. THE CUTTING ON THE SUB AND WEST FLOOD WILL APPEAR TO BE SANDING OR BOXING OUT THE WOOD WITH A POWER Sander. NOT TO PROVIDE ADEQUATE COVERAGE.

10. THE TREATMENT OF HISTORIC PROPERTIES, SPECIFICALLY, REHABILITATION. WHERE POSSIBLE, ALL WORKSHOPS SHOWN ON THIS SHEET ARE IN ACCORDANCE WITH THE NATIONAL HISTORIC PRESERVATION ACT.

11. INSTALL NEW LED JELLY JAR LIGHT FIXTURES THROUGHOUT THE BARN.

12. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.

13. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.

14. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.

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19. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.

20. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.

IMMEDIATE BARN RECOMMENDATIONS
1. REMOVE VIN*ES FROM THE EXTERIOE OF THE BARN. PREVENT THEM FROM GROWING OR ROTATING OUTWARD AND TO SUPPORT ANY NEW STATE.

2. INSTALL NEW LED JELLY JAR LIGHT FIXTURES THROUGHOUT THE BARN.

3. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.

4. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.

5. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.

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20. INSTALL A CUTOUT IN THE CEILING OR WALL TO ALLOW ACCESS TO THE ROOF SPACE.
BARN FLOOR PLANS AND ELEVATION KEY NOTES

GENERAL NOTES


C. CONSERVATION ANALYSIS OF THE HAY LOFT FRAMING JOISTS BASED ON THE VISIBLE CONDITION OF THE JOISTS, IT IS MORE REASONABLE TO REPLACE THE HAY LOFT FRAMING JOISTS WITH MODERN LUMBER, WHERE THE HEADER JOIST AT THE WEST SIDE OF THE STAIR OPENING.

D. THE EXISTING MEMBERS ARE INADEQUATE, AND REPAIRS IN KIND WERE NOT REPAIRED SHOW REPAIRED ARE NOT EXEMPT FROM THIS RECOMMENDATION. THE MULTIPLE SPLIT AND BROKEN RAFTERS THAT WERE NOT REPAIRED SHOWED THAT THE EXISTING MEMBERS ARE INADEQUATE, AND REPAIRS IN KIND WERE NOT REPAIRED SHOW REPAIRED ARE NOT EXEMPT FROM THIS RECOMMENDATION.

E. THE GUTTERS ON THE EAST AND WEST ROOF EAVES APPEAR TO BE SAGGING OR ROTATING OUTWARD AND MAY NEED SOME WOOD CONSTRUCTION TO REPAIR THE GUTTERS AND STRAIGHTEN AS NECESSARY. THE GUTTERS SHOULD BE SECURELY FASTENED TO THE CURB, EXTENDING ABOVE THE SILL, AND FITTED WITH MAIN FLOOD PLATE CLEARANCE AND SECURED WITH NUTS.

F. THE HEADER JOISTS AT THE WEST SIDE OF THE STAIR OPENING FRAMES INTO THE TRIMMER JOISTS. THE POSTS SHOULD BE CAREFULLY SORTED THROUGH BY A CONSERVATOR TO PROVIDE ADEQUATE COVERAGE FROM THE HOUSE. THE MULTIPLE SPLIT AND BROKEN RAFTERS THAT WERE NOT REPAIRED SHOW REPAIRED ARE NOT EXEMPT FROM THIS RECOMMENDATION.

G. INSTALL NEW LED JELLY JAR LIGHT FIXTURES THROUGHOUT THE BARN TO PROVIDE ADEQUATE ILLUMINATION.

H. INSTALL WOOD BLOCKING AT THE WEST STAIR STRINGER TO REINFORCE THE CONNECTION.

I. INSTALL STUDS AT A 203 146231 38797 TOTAL 10 WINDOW OPENINGS.

J. INSTALL NEW GENERAL PURPOSE RECEPTACLES THROUGHOUT THE BARN TO PROVIDE ADEQUATE COVERAGE FOR LARGER TOUR SIZE OF LIMIT OF 8 PEOPLE WOULD BE APPROPRIATE. IT IS RECOMMENDED THAT THE WAY LIGHT NOT BE USED FOR ANY SORT OF MATERIAL STORAGE.


L. INSTALL 4X4 WOOD POSTS AT THE CORNERS OF THE STAIR OPENING.

M. ANCHOR SILL PLATE TO THE EXISTING CONCRETE CURB AT A 6-1/2" THICKNESS AT THE EAST SIDE OF THE OPENING FRAMES INTO THE TRIMMER JOISTS. THE POSTS SHALL BE INSTALLED IN LINE WITH EACH OTHER AT THE ROOF RIDGE AND TO SUPPORT ANY NEW STATE REQUIREMENTS.

N. INSTALL SUPPLEMENTAL HORIZONTAL FRAMING AT GUARDRAIL AT NORTH SIDE OF THE STAIR OPENING.

O. INSTALL STUDS AT A 2001 HISTORIC PAINT ANALYSIS FOR LARGER TOUR SIZE OF LIMIT OF 8 PEOPLE WOULD BE APPROPRIATE. IT IS RECOMMENDED THAT THE WAY LIGHT NOT BE USED FOR ANY SORT OF MATERIAL STORAGE.


Q. INSTALL 4X4 WOOD POSTS AT THE CORNERS OF THE STAIR OPENING.

R. ANCHOR SILL PLATE TO THE EXISTING CONCRETE CURB AT A 6-1/2" THICKNESS AT THE EAST SIDE OF THE OPENING FRAMES INTO THE TRIMMER JOISTS. THE POSTS SHALL BE INSTALLED IN LINE WITH EACH OTHER AT THE ROOF RIDGE AND TO SUPPORT ANY NEW STATE REQUIREMENTS.

S. INSTALL SUPPLEMENTAL HORIZONTAL FRAMING AT GUARDRAIL AT NORTH SIDE OF THE STAIR OPENING.

T. INSTALL STUDS AT A 2001 HISTORIC PAINT ANALYSIS FOR LARGER TOUR SIZE OF LIMIT OF 8 PEOPLE WOULD BE APPROPRIATE. IT IS RECOMMENDED THAT THE WAY LIGHT NOT BE USED FOR ANY SORT OF MATERIAL STORAGE.


V. INSTALL 4X4 WOOD POSTS AT THE CORNERS OF THE STAIR OPENING.

W. ANCHOR SILL PLATE TO THE EXISTING CONCRETE CURB AT A 6-1/2" THICKNESS AT THE EAST SIDE OF THE OPENING FRAMES INTO THE TRIMMER JOISTS. THE POSTS SHALL BE INSTALLED IN LINE WITH EACH OTHER AT THE ROOF RIDGE AND TO SUPPORT ANY NEW STATE REQUIREMENTS.

X. INSTALL SUPPLEMENTAL HORIZONTAL FRAMING AT GUARDRAIL AT NORTH SIDE OF THE STAIR OPENING.

Y. INSTALL STUDS AT A 2001 HISTORIC PAINT ANALYSIS FOR LARGER TOUR SIZE OF LIMIT OF 8 PEOPLE WOULD BE APPROPRIATE. IT IS RECOMMENDED THAT THE WAY LIGHT NOT BE USED FOR ANY SORT OF MATERIAL STORAGE.
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Ohio History Connection, Ohio State Archives
   - MIC 25, Paul Laurence Dunbar Papers
   - P70 Paul Laurence Dunbar Photograph Collection
   - PA Box 3076, Pamphlets
   - P365, OHC Properties File, Box 4, folder 4
   - State Archives Series 3072, Society Properties and General Information Files
   - State Archives Series 3074, Curator of State Memorials Correspondence
   - State Archives Series 3097, Curator of State Memorials Records

Ohio History Connection, Historic Sites and Facilities Office
   - File Boxes
   - Flat Files
   - Vertical Files

Ohio History Connection, State Historic Preservation Office

Dayton History Digital Archive, [https://daytonhistory.pastperfectonline.com/](https://daytonhistory.pastperfectonline.com/)

Dayton Metro Library
   - MS-002 Paul Laurence Dunbar Collection
   - MS-005 Montgomery County Historical Society Collection

Dunbar House State Memorial, Facility Files

Montgomery County Records Center and Archives
   - Aerial Photographs, 1938, 1949, 1972
   - Deed Record Book

Wright State University Special Collections and Archives:
   - Dayton City Commission Minutes
Oral Interview

LaVerne Sci, Former Paul Laurence Dunbar State Historic Site Director, interview with Angie Gaebler, STRATA Architecture and Greg DeVries, Quinn Evans Architects, Paul Laurence Dunbar House, August 8, 2018.
THE HOME OF PAUL LAURENCE DUNBAR.

Watchword, March 6, 1906. (1905 photo) OHC PA307_6-01
Appendix A

Photos: ca. 1904-2018
One of very few known photos of Paul Laurence Dunbar at the house on Summit Street. (Now N. Paul Laurence Dunbar Street.)

May have been taken soon after Paul and Matilda bought the house.
May have been taken soon after Paul and Matilda bought the house.

Matilda near front porch.

May have been taken soon after Paul and Matilda bought the house.
This appears in various collections, and is often labeled as being in the house on Summit Street, but at least one source says it was taken somewhere else. (Chris Buchanan, "Early Technological Updates at the Paul Laurence Dunbar House."

One of oldest known photos of the house, from an article published just after Dunbar's death.
The image is a detail of one of the oldest known photos of the Paul Laurence Dunbar House, from an article published just after Dunbar's death. The image was published in Watchword, March 6, 1906. The photo date is 1905.
One of oldest known photos of the house from an article published just after Dunbar's death.

Cover of the Watchword Magazine published March 3, 1906.

Watchword, March 6, 1906 (1905 photo)
OHC PA307_6_02
Watchword magazine published an article about Matilda Dunbar, “Mother of a Great Negro Poet.” Sept. 8, 1935. This photo was printed with the article, but it appears to be a reprint of one they took for an article published in 1906.

Notes

Matilda Dunbar was profiled in a book by Hallie Q. Brown, Homespun Heroes and Other Women of Distinction. (Aldine Publishing Co, Xenia, OH, 1926) pp. 156-159. This photo was in that book.
Matilda Dunbar. It is not known where this photo was taken. It was probably in the late 1920s or early 1930s. (She died in 1934.)

Notes

Photo Date Source

Date unknown

Image Sources

OHC Collection P70

Paul Laurence Dunbar House HSR-CLR  2019

Photo Date

ca. 1920s

Notes

Photo included in a 1914 -1915 brochure for the Dunbar Memorial Association.

Image Sources

Paul L. Dunbar Collection Dayton Metro Library

Photo Date Source

Date unknown
This photo was used in a 1932 brochure for the house. It was included in the National Archives copy of the National Register nomination.

Plaque on the front wall of the house. The plaque dates to 1921, the photo may be later.
Image Sources

DAAV Vertical File, museum catalogue

Notes

Image from a museum catalogue cover "Museum Echoes Feb. 1956." Photo appears to be from the late 1930s.

Photo Date Source

publication

Photo Date

c. 1930s (1956 reprint)

Notes

Matilda Dunbar. The photo was used in a 1938 article, but she died in 1934.

Image Sources

Paul L. Dunbar Collection Dayton Metro Library b2f4 and OHC P70

Photo Date Source

Publication

Photo Date

c. 1933
**Photo Date**
ca. 1935

**Notes**
*Watchword* magazine published an article about Matilda Dunbar, “Mother of a Great Negro Poet.” Sept. 8, 1935. This photo was printed with the article.

---

**Image Sources**
*Paul L. Dunbar Collection Dayton Metro Library, f2b6.*
Note:
Front and back sides of an undated postcard. This photo of the house was used for years after the state bought the property. The Ohio State Museum was in operation under that name at least as early as 1933. This photo is dated 1936; it was used in multiple publications.

Image Sources:
OHC Collection P365

OHC P70_B02F07_Dun180.
This appears to have been taken before the state did any work on the house. Note the curtains are changed in photos taken just a year or two later. Also note that the rear porch is white in this image.

Note in the OHC file says the man on the left here is Edwin Zepp, the Curator of State Memorials in Ohio.

Note the fresh paint on the house to the right and the large size of the plant by the front steps.
Dunbar’s bedroom. This bike was given to Dunbar by the Wright Brothers. (NHL 7.2)

Dunbar’s Study, second floor, front. Note the new curtains.

A-13
Parlor at front of the first floor.

Image Sources
OHC Collection P365

Photo Date Source
Hitch and Straker, 15

Reception Hall

Image Sources
OHC Collection P365
This brochure was used at the dedication of the house museum in 1938. Note that tree(s) in front have been removed, but the steps have not been replaced.

Image Sources:
DAAV files, copy from Dayton Public Library. Paul Laurence Dunbar Collection, B. 1, F 3, Programs

Photo Date Source:
brochure

Notes:
1938 newspaper clipping.
From a newspaper article about celebration of Dunbar's birthday at Summit Street house. This appears to be the stock photo the state was using in the late 1930s.

Notes


This was probably taken June 7 or 8, 1938, per a note in a letter written by Edwin Zepp that same month. (OHC collection 3074)
Photo Date
ca. 1939

Notes
The house to the north is unpainted here, but appears to be freshly painted white in other photos taken around this time. This might just be due to a change of lighting.

The barn in the background is freshly painted, and that work was done in early 1938.

Image Sources
OHC Collection P365, and 3072
Dayton History–Mayfield Collection 095P20125015266.JPG

Photo Date Source
Dayton History put this at 1939. It is clearly after 1921, when the plaque was installed on the front wall, and before the front steps were replaced sometime after 1938.

---

Photo Date
ca. 1940s

Notes
This appears to have been taken close to the time the state purchased the property, but may be a couple of years after. The sign in the front yard does not appear in mid-1930s images.

According to sources in the Ohio History Connection catalogue, the Ohio Development and Publicity Commission (notes at bottom) was active at least from 1947 to the 1950s.

Image Sources
OHC Collection P365

Photo Date Source
A­17
Notes
From an article about the annual celebration of Dunbar's birth.
No foundation plantings.
Original stairs still in place.

Notes
Undated file photo. This is the marker on Dunbar's grave.

Image Sources

Image Sources
OHC Collection P365
One of the last photos of the era to show slate roofing. A note on the back of this photo includes the date and the words "Photo by L. G. Gray." No information about Gray has been found to date. The brick wall below the ladder appears to be partly covered with vines.

Oberliesen puts date at ca. 1938, but that might be a little late. Presence of a shopping cart indicates that this photograph was taken later.
Image Sources
OHC Collection P365

Photo Date Source
Oberliesen puts date at ca. 1938, but that might be a little late. Presence of a shopping cart indicates that this photograph was taken later.

Notes
Barn, from the alley.
The back of this print is stamped "L. G. Gray Photos Lebanon." No further information on Gray has been found.
NOTE: Another photo by Gray in this same collection is dated 1951, and it is possible that his photo was made at that time as well.

Image Sources
Paul L. Dunbar Collection Dayton Metro Library b2f4
"Visitors Turned Away."

Photo Date Source
publication date
This is the first image of railings at the front steps.
Photo Date
ca. 1965

Notes

Image Sources
OHC Collection P70_B02F07

Photo Date Source
Ivy and site objects

---

Photo Date
1968

Notes
Note wallpaper pattern

Image Sources
DAAV Vertical File, newspaper clipping

Photo Date Source
ewspaper

A-22
No date given, but the wallpaper matches that seen in another photo that appeared in the local paper in 1968.

Dunbar library desk. Although this photo is dated 1981 in the Wright State collections, it appears to be the same photo that was published in the local newspaper in 1968.
This photo was used in a 1970 brochure for the house. It was included in the National Archives copy of the National Register nomination.

Notes

This is the only image found with this yard sign. The photo may have been taken shortly before the National Register nomination was prepared in 1975.
<table>
<thead>
<tr>
<th>Image Sources</th>
<th>Photo Date Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Historic Landmark nomination, house, 1977</td>
<td>NHL nomination</td>
</tr>
</tbody>
</table>

**Notes**
Barn in 1975, from Register nomination for the house.

<table>
<thead>
<tr>
<th>Photo Date</th>
<th>Photo Date Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>NHL nomination</td>
</tr>
</tbody>
</table>

**Notes**
NHL nomination for the house.
NHL nomination for the house. Note the sign—it was used into the mid 1990s.

Image Sources
National Historic Landmark nomination, house

Photo Date Source
NHL nomination

Register nomination for the house.

Image Sources
National Register nomination, house

Photo Date Source
Register nomination
This photo was used on a brochure for the house which was included in the National Archives file for the Register nomination for the house.

Image Sources
National Register nomination, house

Notes
OHC Collection P70_B02F07_Dun183.
Paul Laurence Dunbar House HSR-CLR  2019

Photo Date
ca. 1976

Notes

Wright State Library website, https://libraries.wright.edu/

Image Sources

Photo Date Source

website

Paul Laurence Dunbar House HSR-CLR  2019

Photo Date
ca. 1976

Notes
Dunbar bedroom, ca. 1976.

Wright State Library website, https://libraries.wright.edu/

Image Sources

Photo Date Source

Wright State special collections
Notes
Article notes home is maintained by Ohio Historical Society.

Image Sources

Photo Date Source
newspaper
The yard sign was in use between ca. 1975-ca. 1990.

Notes
1980 Register nomination for the district.

Image Sources
National Register nomination, district

Photo Date Source
Register nomination

---

The yard sign was in use between ca. 1975-ca. 1990.

Notes
Sign design. This sign was in place from ca. 1970s to ca. 1990.

Image Sources
OHC collection P70

Photo Date Source
Register nomination
The yard sign was in use between ca. 1975-ca. 1990.

Article noted house was "in for facelift with release of state funds."

Photo is labeled library, but this is the reception room. This image shows a combination sideboard/bed that was owned by the Dunbars and is still in the house today.

Wright State Library website, https://libraries.wright.edu/
Plantings added around the yard sign. Foundation plantings replaced. New shrubs near arbor in back. Slate roofing has been restored.

Notes:

Visitor center designed in early 1990s, built ca. 1994.

Image Sources:

From office in visitor center

Photo Date Source:

Visitor center designed in early 1990s, built ca. 1994.
This sign was in place from around the 1990s to around 2001.

Ca. 1997, in the file with the Register nomination for the house.

National Register nomination file for the house.
The back porch went from white in 2003 to green in this photo (2006.) Also, the windows and the barn were all red in 2001. Those color changes happened in 2003.
Note that the barn has changed from red (2001) to dark yellow. Note: the brick sign shown here was in place by 2005, per Google Earth images.

Image Sources
Ohio Archeology Facility file, project A4800, investigation for ADA ramp.

Photo Date Source
file
Looking from the alley.

Ohio Archeology Facility file, project A4800, investigation for ADA ramp.
Looking from the alley to the back porch.

Notes
Ohio Archeology Facility file, project A4800, investigation for ADA ramp.

Image Sources
Ohio Archeology Facility file, project A4800, investigation for ADA ramp.

Photo Date Source
file

A-39

HISTORIC DRAWINGS
Appendix B

Historic Drawings

1937 Field Notes (3 pages)
1947 Drawings (5 sheets)
1981 HABS Drawings (6 sheets)

North arrows and notes added by Deb Sheals, 2018.
Appendix B

Historic Drawings

1937 Field Notes (3 pages)

These plans were probably made as the state was making preparations to open the house to the public.
First floor of the house.

Chimney detail
Front steps, sidewalks, and footprint of the house.
Back of house, barn, and shed.
Appendix B

Historic Drawings

1947 Drawings (5 sheets)

These drawings were probably used by staff of the house museum. The pages have been rotated to match the alignment of the 1937 field notes above.
First floor of the house.
Second floor of the house.
Barn, second floor.
Appendix B

Historic Drawings

1981 HABS Drawings (6 sheets)
Wrong information. The house was built 1887-88, and sold to Matilda Dunbar in 1904. ds 2018
Loft of Barn, looking north, 2018. [STRATA]

C

STRUCTURAL CALCULATIONS
WOOD MEMBER DESIGN/ANALYSIS

Project: Paul Laurence Dunbar House  
Date: 12/12/2018  
Project # 2018067.00  
Engineer: PDS  
Description: First Floor Framing Joist

DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:

DETERMINE ACTUAL EXISTING DL:

<table>
<thead>
<tr>
<th>Wood Density = 22.5 lb/ft^3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per ft. Volume = 0.1389 ft^3</td>
</tr>
<tr>
<td>Per ft. weight = 3.12 lb/ft</td>
</tr>
<tr>
<td>Per Sq. ft. weight = 2.08 psf</td>
</tr>
</tbody>
</table>

Floor wt. = 5 psf  
Ceiling wt. = 0 psf  
Misc. Dead load, wt. = 5 psf  
Total existing floor DL (Factored) = 14.50 psf

A) FLEXURE ANALYSIS

<table>
<thead>
<tr>
<th>Joist Span, L = 16.25 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joist Spacing = 18&quot; o.c.</td>
</tr>
<tr>
<td>Joist Width, b = 2&quot;</td>
</tr>
<tr>
<td>Joist Depth, d = 10&quot;</td>
</tr>
</tbody>
</table>

Area, b.d = 20" in^2  
Section Modulus, Sx = 33.333 in^3  
Moment of Inertia, I_x = 166.667 in^4  
F_b = 775 psi

FLEXURAL ADJUSTMENT FACTORS

<table>
<thead>
<tr>
<th>C_M = 1.00 Wet service factor (Refer NDS Table 4A, footnote, Page #30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_t = 1.0 Temperature factor</td>
</tr>
<tr>
<td>C_L = 1.0 Beam stability factor (Joists braced by flooring)</td>
</tr>
<tr>
<td>C_F = 1.1 Size factor (Refer NDS Table 4A, Page #30)</td>
</tr>
<tr>
<td>C_i = 1.0 Incising factor</td>
</tr>
<tr>
<td>C_r = 1.15 Repetative member factor</td>
</tr>
<tr>
<td>K_F = 2.54 Format Conversion Factor</td>
</tr>
<tr>
<td>Φ = 0.85 Resistance Factor</td>
</tr>
<tr>
<td>λ = 0.80 Time Effect Factor</td>
</tr>
</tbody>
</table>

F_b' = C_M C_t C_L C_F C_i C_r K_F Φ λ = 1693 psi
ULTIMATE MOMENT CAPACITY

\[ M = S_x F' \]
\[ = 56,443.46 \text{ lb.in} \]
\[ = 4,703.62 \text{ lb.ft} \]
\[ M = \frac{w L^2}{8} \]
\[ w L^2/8 = 4,703.62 \text{ lb.ft} \]
\[ w = 142.50 \text{ lb/ft} \]

JOIST SPACING IS 18” O.C.

ULTIMATE TOTAL LOAD PER SQ. FT = 95.00 psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = 50.32 psf

B) SHEAR ANALYSIS

SHEAR ADJUSTMENT FACTORS

\[ F_v = 135 \text{ psi} \]
\[ C_M = 1.00 \text{ Wet service factor (Refer NDS Table 4A, Page #30)} \]
\[ C_t = 1.0 \text{ Temperature factor} \]
\[ C_i = 1.0 \text{ Incising factor} \]
\[ K_F = 2.88 \text{ Format Conversion Factor} \]
\[ \Phi = 0.75 \text{ Resistance Factor} \]
\[ \lambda = 0.80 \text{ Time Effect Factor} \]

\[ F_v' = F_v C_M C_t C_i K_F \Phi \lambda = 233.28 \text{ psi} \]

Joist Width, b = 2”
Joist Depth, d = 10”
Depth of remaining at notch, \( d_r = 8” \)

\[ V_r' = \left[ \frac{F_v' b d_r}{1.5} \right] \left[ \frac{d_r}{d} \right]^2 \] (NDS 3.4.3.2, Eq. 3.4-3)

\[ V_r' = 1592.525 \text{ lb} \]

\[ V = \frac{w L}{2} \]
\[ w L/2 = 1592.525 \text{ lb} \]
\[ w = 196.00 \text{ lb/ft} \]

JOIST SPACING IS 18” O.C.

ULTIMATE TOTAL LOAD PER SQ. FT = 130.67 psf

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = 72.61 psf
DEFLECTION ANALYSIS

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

\[ E' = E \cdot C_M \cdot C_t \cdot C_i \]
\[ = 1,100,000 \text{ psi} \]

- Joist Width, b = 2"
- Joist Depth, d = 10"
- Moment of Inertia, \( I_x \) = 166.667 \( \text{in}^4 \)

Deflection, \( \Delta = \frac{5wL^4}{384EI} \)

Maximum allowable LL deflection, \( \Delta_{LL} = \frac{L}{360} \)
\[ = 0.5417 \text{ inch} \]

Maximum allowable total deflct, \( \Delta_{TL} = \frac{L}{240} \)
\[ = 0.8125 \text{ inch} \]

\[ 0.54'' = \frac{5wL^4}{384EI} \]

\[ w_{LL} = 63.296 \text{ lb/ft} \]
\[ w_{TL} = 94.944 \text{ lb/ft} \]
\[ w_{LL} = 63.29619 \text{ lb/ft} \]
\[ w_{TL} = 94.944 \text{ lb/ft} \]

JOIST SPACING IS 18" O.C.

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = 42.20 psf
MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = 63.30 psf
MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = 48.80 psf

Deflection for existing DL, \( \Delta_{DL} = 0.186'' \)

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = 42.20 psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 42.20 psf
WOOD MEMBER DESIGN/ANALYSIS

Framing Capacity Assessment for Blackstone House

3) Determine Existing Roof Rafter Capacity

Analysis Assumptions:

i) Roof rafter species is Eastern Softwood, No 2

ii) All existing roof rafters are in good condition

Determine Actual Existing DL:

Wood Density = 22.464 lb/ft³

2" x 6" x 1'-0" Volume = 0.0833 ft³

Per ft. weight = 1.87 lb/ft

Per sq. ft. weight = 0.94 psf

Spaced at 24" o.c.

Slate, wt. = 10.0 psf

Sheathing etc, wt = 5.0 psf

Total existing floor DL (factored) = 19.12 psf

Projected @ 45 roof angle (factored) = 13.522 psf

A) Flexure Analysis

Roof Rafter Span, L = 12.69 ft

Roof Rafter Spacing = 24" o.c.

Roof Rafter Width, b = 2"

Roof Rafter Depth, d = 6"

Area, b.d = 12" in²

Section Modulus, Sx = 12,000 in³

Moment of Inertia, Ix = 36,000 in⁴

Fb = 575 psi

Flexural Adjustment Factors

CM = 1.00 Wet service factor (Refer NDS Table 4A, footnote, Page #30)

CT = 1.0 Temperature factor

CL = 1.0 Beam stability factor (Joists braced by flooring)

CR = 1.3 Size factor (Refer NDS Table 4A, Page #30)
C_t = 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

\[ F'_{vb} = C_m C_t C_r C_f C_i K_F \Phi \lambda \]
\[ = 1485 \text{ psi} \]

**ULTIMATE MOMENT CAPACITY**

\[ M = S_x F_b \]
\[ = 17,816.93 \text{ lb.in} \]
\[ = 1,484.74 \text{ lb.ft} \]

\[ M = \frac{w L^2}{8} \]
\[ w L^2/8 = 1,484.74 \text{ lb.ft} \]
\[ w = 73.76 \text{ lb/ft} \]

RAFTER SPACING IS 24" O.C.

ULTIMATE TOTAL LOAD PER SQ. FT = 36.88 psf

LIVE LOAD CAPACITY OF ROOF DUE TO BENDING (UNFACTORED) = 14.60 psf

**B) SHEAR ANALYSIS**

**SHEAR ADJUSTMENT FACTORS**

\[ F_v = 140 \text{ psi} \]
\[ C_m = 1.00 \text{ Wet service factor (Refer NDS Table 4A, Page #30)} \]
\[ C_t = 1.0 \text{ Temperature factor} \]
\[ C_r = 1.0 \text{ Incising factor} \]
\[ K_F = 2.88 \text{ Format Conversion Factor} \]
\[ Φ = 0.75 \text{ Resistance Factor} \]
\[ λ = 0.80 \text{ Time Effect Factor} \]

\[ F'_{vs} = F_v C_m C_t C_r K_F \Phi \lambda \]
\[ = 241.92 \text{ psi} \]

Roof Rafter Width, b = 2"
Roof Rafter Depth, d = 6"
Sill Plate

\[ V_r = \left[ \frac{F'_{vs} bd}{1.5} \right] \quad \text{(NDS 3.4.2, Eq. 3.4-2)} \]
\[ V_r = 1935.360 \text{ lb} \]

\[ V = \frac{w L}{2} \]
\[ w L/2 = 1935.360 \text{ lb} \]
\[ w = 305.02 \text{ lb/ft} \]
RAFTER SPACING IS 24” O.C.

ULTIMATE TOTAL LOAD PER SQ. FT = 152.51 psf

LIVE LOAD CAPACITY OF ROOF DUE TO SHEAR (UNFACTORED) = 86.87 psf

C) DEFLECTION ANALYSIS

MODULUS OF ELASTICITY ADJUSTMENT FACTORS

\[ E = 1,100,000 \text{ psi} \]
\[ C_M = 1.00 \text{ Wet service factor (Refer NDS Table 4A, Page #30)} \]
\[ C_I = 1.0 \text{ Temperature factor} \]
\[ C_t = 1.0 \text{ Incising factor} \]

\[ E' = E C_M C_I C_t = 1,100,000 \text{ psi} \]

Roof Rafter Width, \( b = 2'' \)
Roof Rafter Depth, \( d = 6'' \)
Moment of Inertia, \( I_c = 36,000 \text{ in}^4 \)

Deflection, \( \Delta = \frac{5 w L^4}{384 EI} \)

Maximum allowable LL deflection, \( \Delta_{LL} = \frac{L}{360} = 0.4230 \text{ inch} \)

Maximum allowable total deflct, \( \Delta_{TL} = \frac{L}{240} = 0.6345 \text{ inch} \)

\[ 0.42'' = \frac{5 w L^4}{384 EI} \]

\[ w_{LL} = 28.708 \text{ lb/ft} \]
\[ w_{TL} = 43.062 \text{ lb/ft} \]

RAFTER SPACING IS 24” O.C.

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = 14.35 psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = 21.53 psf

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = 8.01 psf

Deflection for existing DL, \( \Delta_{DL} = \frac{L}{382} \)

Deflection for existing DL, \( \Delta_{DL} = 0.398'' \)

TOTAL LIVE LOAD CAPACITY OF ROOF DUE TO DEFLECTION = 8.01 psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 8.01 psf
WOOD MEMBER DESIGN/ANALYSIS

Project: Paul Laurence Dunbar House
Project #: 2018067.00
Description: Barn Framing Joist
Date: 12/12/2018
Engineer: PDS

DETERMINE EXISTING FLOOR JOIST CAPACITY

ANALYSIS ASSUMPTIONS:


DETERMINE ACTUAL EXISTING DL:

Wood Density = 22.5 lb/ft^3
Per ft. Volume = 0.1215 ft^3
Per ft. weight = 2.73 lb/ft
Per Sq. ft. weight = 1.37 psf

Floor wt. = 5 psf
Ceiling wt. = 0 psf
Misc. Dead load, wt. = 5 psf
Total existing floor DL (Factored) = 13.64 psf

A) FLEXURE ANALYSIS

Joist Span, L = 20.00 ft
Joist Spacing = 24" o.c.
Joist Width, b = 1.75"
Joist Depth, d = 10"
Area, b.d = 17.5" in^2
Section Modulus, Sx = 29.167 in^3
Moment of Inertia, I_x = 145.833 in^4
F_b = 775 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_R = 1.1 Size factor (Refer NDS Table 4A, Page #30)
C_I = 1.0 Incising factor
C_F = 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_R C_I C_F K_F Φ λ

= 1693 psi
ULTIMATE MOMENT CAPACITY

\[ M = S_x F'_b \]
\[ = 49,388.02 \text{ lb.in} \]
\[ = 4,115.67 \text{ lb.ft} \]
\[ M = w L^2 \]
\[ = 8 \]
\[ w L^2/8 = 4,115.67 \text{ lb.ft} \]
\[ w = 82.31 \text{ lb/ft} \]

**JOIST SPACING IS 24” O.C.**

ULTIMATE TOTAL LOAD PER SQ. FT = \[ 41.16 \text{ psf} \]

LIVE LOAD CAPACITY OF FLOOR DUE TO BENDING (UNFACTORED) = \[ 17.20 \text{ psf} \]

B) **SHEAR ANALYSIS**

**SHEAR ADJUSTMENT FACTORS**

\[ F_v = 135 \text{ psi} \]
\[ C_M = 1.00 \text{ Wet service factor (Refer NDS Table 4A, Page #30)} \]
\[ C_t = 1.0 \text{ Temperature factor} \]
\[ C_i = 1.0 \text{ Incising factor} \]
\[ K_F = 2.88 \text{ Format Conversion Factor} \]
\[ \Phi = 0.75 \text{ Resistance Factor} \]
\[ \lambda = 0.80 \text{ Time Effect Factor} \]

\[ F'_v = F_v C_M C_t C_i K_F \Phi \lambda \]
\[ = 233.28 \text{ psi} \]

Joist Width, \( b = 1.75” \)
Joist Depth, \( d = 10” \)

Depth of remaining at notch, \( d_n = 8” \)

\[ V'_r = \frac{F'_v b d_n}{1.5} \left[ \frac{d_n}{d} \right]^2 \]
(NDS 3.4.3.2, Eq. 3.4-3)

\[ V'_r = 1393.459 \text{ lb} \]

\[ V = \frac{w L}{2} \]
\[ w L/2 = 1393.459 \text{ lb} \]
\[ w = 139.35 \text{ lb/ft} \]

**JOIST SPACING IS 24” O.C.**

ULTIMATE TOTAL LOAD PER SQ. FT = \[ 69.67 \text{ psf} \]

LIVE LOAD CAPACITY OF FLOOR DUE TO SHEAR (UNFACTORED) = \[ 35.02 \text{ psf} \]
C) **DEFLECTION ANALYSIS**

**MODULUS OF ELASTICITY ADJUSTMENT FACTORS**

\[ E = 1,100,000 \text{ psi} \]

\[ C_M = 1.00 \text{ Wet service factor (Refer NDS Table 4A, Page #30)} \]

\[ C_T = 1.0 \text{ Temperature factor} \]

\[ C_I = 1.0 \text{ Incising factor} \]

\[ E' = E \cdot C_M \cdot C_T \cdot C_I \]

\[ = 1,100,000 \text{ psi} \]

Joist Width, \( b = 1.75'' \)

Joist Depth, \( d = 10'' \)

Moment of Inertia, \( I_x = 145.833 \text{ in}^4 \)

Deflection, \( \Delta = \frac{5 w L^4}{384EI} \)

Maximum allowable LL deflection, \( \Delta_{LL} = \frac{L}{360} \)

\[ = 0.6667 \text{ inch} \]

Maximum allowable total deflct, \( \Delta_{TL} = \frac{L}{240} \)

\[ = 1.0000 \text{ inch} \]

\[ 0.67'' = \frac{5 w L^4}{384EI} \]

\[ \Rightarrow w_{LL} = 29.707 \text{ lb/ft} \]

\[ w_{TL} = 44.560 \text{ lb/ft} \]

JOIST SPACING IS 24'' O.C.

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = 14.85 psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT = 22.28 psf

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT = 8.64 psf

Deflection for existing DL, \( \Delta_{DL} = 0.612'' \)

Deflection for existing DL, \( \Delta_{DL} = \frac{L}{392} \)

TOTAL LIVE LOAD CAPACITY OF FLOOR DUE TO DEFLECTION = 8.64 psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION = 8.64 psf
WOOD MEMBER DESIGN/ANALYSIS

Project: Paul Laurence Dunbar House
Date: 12/12/2018
Project #: 2018067.00
Engineer: PDS
Description: Roof Rafter Analysis

FRAMING CAPACITY ASSESMENT FOR BLACKSTONE HOUSE

3) DETERMINE EXISTING ROOF RAFTER CAPACITY

ANALYSIS ASSUMPTIONS:
i) Roof rafter species is Eastern White Pine, No 1
ii) All Existing roof rafters are in good condition

Determine Actual Existing DL:

Wood Density = 22.464 lb/ft^3
2" x 6" x 1'-0" Volume = 0.0699 ft^3
Per ft. weight = 1.57 lb/ft
Per Sq. ft. weight = 0.78 psf
Spaced at 24 o.c.

Roof, wt. = 7.0 psf
Misc, wt = 1.5 psf

Total existing floor DL (Factored) = 11.14 psf
Projected @ 45 roof angle (Factored) = 7.878 psf

A) FLEXURE ANALYSIS

Roof Rafter Span, L = 14.10 ft
Roof Rafter Spacing = 24" o.c.
Roof Rafter Width, b = 1.75"
Roof Rafter Depth, d = 5.75"
Area, b.d = 10.0625" in^2
Section Modulus, S_x = 9.643 in^3
Moment of Inertia, I_p = 27.724 in^4
F_b = 775 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 = 1.3 Size factor (Refer NDS Table 4A, Page #30)
C_i = 1.0 Incising factor  
C_r = 1.15 Repetative member factor  
K_p = 2.54 Format Conversion Factor  
Φ = 0.85 Resistance Factor  
λ = 0.80 Time Effect Factor

\[ F_b' = C_M C_i C_r C_f C_i C_r K_p Φ λ \]
\[ = 2001 \text{ psi} \]

**ULTIMATE MOMENT CAPACITY**

\[ M = S_x F_b' \]
\[ = 19,297.81 \text{ lb.in} \]
\[ = 1,608.15 \text{ lb.ft} \]
\[ M = w L^2 / 8 \]
\[ w L^2 / 8 = 1,608.15 \text{ lb.ft} \]
\[ w = 64.71 \text{ lb/ft} \]

RAFTER SPACING IS 24" O.C.

**ULTIMATE TOTAL LOAD PER SQ. FT** = 32.36 psf

**LIVE LOAD CAPACITY OF ROOF DUE TO BENDING (UNFACTORED)** = 15.30 psf

**B) SHEAR ANALYSIS**

**SHEAR ADJUSTMENT FACTORS**

\[ F_v = 135 \text{ psi} \]
\[ C_M = 1.00 \text{ Wet service factor (Refer NDS Table 4A, Page #30)} \]
\[ C_i = 1.0 \text{ Temperature factor} \]
\[ C_r = 1.0 \text{ Incising factor} \]
\[ K_p = 2.88 \text{ Format Conversion Factor} \]
\[ Φ = 0.75 \text{ Resistance Factor} \]
\[ λ = 0.80 \text{ Time Effect Factor} \]

\[ F_v' = F_v C_M C_i C_r K_p Φ λ \]
\[ = 233.28 \text{ psi} \]

Roof Rafter Width, \( b = 2" \)
Roof Rafter Depth, \( d = 5.75" \)
Sill Plate

\[ V_r = \left[ \frac{F_v' bd}{1.5} \right] \text{ (NDS 3.4.2, Eq. 3.4-2)} \]

\[ V_r = 1788.480 \text{ lb} \]

\[ V = \frac{w L}{2} \]
\[ w L/2 = 1788.480 \text{ lb} \]
\[ w = 253.69 \text{ lb/ft} \]
RAFTER SPACING IS  24”   O.C.

ULTIMATE TOTAL LOAD PER SQ. FT =  **126.84** psf

LIVE LOAD CAPACITY OF ROOF DUE TO SHEAR (UNFACTORED) =  **74.35** psf

C)  **DEFLECTION ANALYSIS**

**MODULUS OF ELASTICITY ADJUSTMENT FACTORS**

\[ E' = \frac{E}{C_M C_T C_I} \]

\[ E = 1,100,000 \text{ psi} \]

\[ C_M = 1.00 \text{ Wet service factor (Refer NDS Table 4A, Page #30)} \]

\[ C_T = 1.0 \text{ Temperature factor} \]

\[ C_I = 1.0 \text{ Incising factor} \]

\[ E' = \frac{1,100,000}{1.0} = 1,100,000 \text{ psi} \]

Roof Rafter Width, \( b = 1.75” \)

Roof Rafter Depth, \( d = 5.75” \)

Moment of Inertia, \( I = 27.724 \text{ in}^4 \)

Deflection, \( \Delta = \frac{5 w L^4}{384 E I} \)

Maximum allowable LL deflection, \( \Delta_{LL} = \frac{L}{360} = 0.4700 \text{ inch} \)

Maximum allowable total deflection, \( \Delta_{TL} = \frac{L}{240} = 0.7050 \text{ inch} \)

\[ 0.47” = \frac{5 w L^4}{384 E I} \]

\[ w_{LL} = 16.117 \text{ lb/ft} \]

\[ w_{TL} = 24.176 \text{ lb/ft} \]

RAFTER SPACING IS  24”   O.C.

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT =  **8.06** psf

MAXIMUM ALLOWABLE TOTAL LOAD PER SQ. FT =  **12.09** psf

MAXIMUM ALLOWABLE LIVE LOAD PER SQ. FT =  **4.21** psf

Deflection for existing DL, \( \Delta_{DL} = \frac{L}{368} \)

Deflection for existing DL, \( \Delta_{DL} = 0.459” \)

TOTAL LIVE LOAD CAPACITY OF ROOF DUE TO DEFLECTION =  **4.21** psf

MAX. LIVE LOAD CAPACITY DUE TO BENDING/SHEAR/DEFLECTION =  **4.21** psf
PAUL LAURENCE DUNBAR

Max occupancy loading for House

Controlling condition: Room 101 - 9 Joists at ~ 18" O.C.
Spanning 16' - 3"

Calculated Joist capacity: 42 PSF

\[
\frac{9 \times 18'' \times 16.25'}{12''} = 219 \text{ SF} \times 42 \text{ PSF} = 9,200 \text{ lb}
\]

\[
\frac{9,200 \text{ lb}}{250 \text{ lb/person (assumed)}} = 36.8 \text{ people}
\]

Max occupancy loading for Barn - Hay Loft

Controlling condition: 2' x 10'' @ 24'', 20' span

Calculated Joist capacity: ~ 8.6 PSF

Occupiable space = 75% of area (stairs/fed hopper)

\[
32' \times 20' \times 0.75 = 4,180 \text{ SF} \times 8.6 \text{ PSF} = 41,000 \text{ lb}
\]

\[
\frac{41,000 \text{ lb}}{250 \text{ lb/person}} = 164 \text{ people}
\]

Use 2.0 SF -> 80 people
1 piece(s) 2 x 8 Southern Pine No. 2 @ 24" OC

Overall Sloped Length: 15° 6 7/8"

All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

### Design Results

<table>
<thead>
<tr>
<th>Member Reaction (lbs)</th>
<th>Allowed</th>
<th>Result</th>
<th>LDF</th>
<th>Load: Combination (Pattern)</th>
</tr>
</thead>
<tbody>
<tr>
<td>479 @ 10' 3 1/2&quot; SPF</td>
<td>1271 (1.50&quot;)</td>
<td>Passed (38%)</td>
<td>--</td>
<td>1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)</td>
</tr>
<tr>
<td>380 @ 9' 10 3/8&quot; SPF</td>
<td>1459</td>
<td>Passed (26%)</td>
<td>1.15</td>
<td>1.0 D + 1.0 S (All Spans)</td>
</tr>
<tr>
<td>1046 @ 5 3/4&quot; SPF</td>
<td>1339</td>
<td>Passed (78%)</td>
<td>1.15</td>
<td>1.0 D + 1.0 S (All Spans)</td>
</tr>
<tr>
<td>0.366 @ 5' 3&quot;</td>
<td>0.713</td>
<td>Passed (L/467)</td>
<td>--</td>
<td>1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)</td>
</tr>
<tr>
<td>0.662 @ 5' 3&quot;</td>
<td>0.951</td>
<td>Passed (L/258)</td>
<td>--</td>
<td>1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)</td>
</tr>
</tbody>
</table>

* Deflection criteria: LL (L/240) and TL (L/180).
* Input live load span ratio deflection limit is below building code minimum value of L/240. This minimum value was used for design.
* Input total load span ratio deflection limit is below building code minimum value of L/180. This minimum value was used for design.
* Birdsmouth cut has not been analyzed.
* Top Edge Bracing (Lu): Top compression edge must be braced at 8' 10" o/c unless detailed otherwise.
* Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 14' 7" 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.

### Supports

<table>
<thead>
<tr>
<th>Supports</th>
<th>Bearing Length</th>
<th>Loads to Supports (lbs)</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Available</td>
<td>Required</td>
</tr>
<tr>
<td>1 - Birdsmouth - SPF</td>
<td>3.50&quot;</td>
<td>3.50&quot;</td>
<td>1.50&quot;</td>
</tr>
<tr>
<td>2 - Hanger on 7 1/4&quot; SPF beam</td>
<td>3.50&quot;</td>
<td>Hanger¹</td>
<td>1.50&quot;</td>
</tr>
</tbody>
</table>

* Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
* 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

<table>
<thead>
<tr>
<th>Support</th>
<th>Model</th>
<th>Seat Length</th>
<th>Top Nails</th>
<th>Face Nails</th>
<th>Member Nails</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - Face Mount Hanger</td>
<td>Connector not found</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

### Loads

<table>
<thead>
<tr>
<th>Location (Side)</th>
<th>Spacing</th>
<th>Dead (0.90)</th>
<th>Roof Live (non-snow: 1.25)</th>
<th>Snow (1.15)</th>
<th>Wind (1.60)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Uniform (PSF)</td>
<td>0 to 10' 7&quot;</td>
<td>24&quot;</td>
<td>15.0</td>
<td>20.0</td>
<td>20.0</td>
<td>25.0</td>
</tr>
</tbody>
</table>

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator.
**Level, Floor: Drop Beam**

1 piece(s) 3 1/2" x 12" 24F-V4 DF Glulam

**Overall Length: 13' 1"**

All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

### Design Results

<table>
<thead>
<tr>
<th></th>
<th>Actual @ Location</th>
<th>Allowed</th>
<th>Result</th>
<th>LDF</th>
<th>Load: Combination (Pattern)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member Reaction (lbs)</td>
<td>5509 @ 2&quot;</td>
<td>7963 (3.50&quot;)</td>
<td>Passed (69%)</td>
<td>--</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>Shear (lbs)</td>
<td>4422 @ 1' 3 1/2&quot;</td>
<td>7420</td>
<td>Passed (60%)</td>
<td>1.00</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>Pos Moment (ft-lbs)</td>
<td>17114 @ 6' 6 1/2&quot;</td>
<td>16800</td>
<td>Passed (102%)</td>
<td>1.00</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>Live Load Defl. (in)</td>
<td>0.419 @ 6' 6 1/2&quot;</td>
<td>0.425</td>
<td>Passed (L/365)</td>
<td>--</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>Total Load Defl. (in)</td>
<td>0.552 @ 6' 6 1/2&quot;</td>
<td>0.637</td>
<td>Passed (L/277)</td>
<td>--</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
</tbody>
</table>

- Deflection criteria: LL (L/360) and TL (L/240).
- Top Edge Bracing (Lu): Top compression edge must be braced at 6" o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13" 1" o/c unless detailed otherwise.
- Critical positive moment adjusted by a volume factor of 1.00 that was calculated using length L = 12' 9".
- The effects of positive or negative camber have not been accounted for when calculating deflection.
- The specified glulam is assumed to have its strong laminations at the bottom of the beam. Install with proper side up as indicated by the manufacturer.
- Applicable calculations are based on NDS.

### Supports

<table>
<thead>
<tr>
<th>Supports</th>
<th>Bearing Length</th>
<th>Loads to Supports (lbs)</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Available</td>
<td>Required</td>
</tr>
<tr>
<td>1 - Column - SPF</td>
<td>3.50&quot;</td>
<td>3.50&quot;</td>
<td>2.42&quot;</td>
</tr>
<tr>
<td>2 - Column - SPF</td>
<td>3.50&quot;</td>
<td>3.50&quot;</td>
<td>2.42&quot;</td>
</tr>
</tbody>
</table>

### Loads

<table>
<thead>
<tr>
<th>Loads</th>
<th>Location (Side)</th>
<th>Tributary Width</th>
<th>Dead (0.90)</th>
<th>Floor Live (1.00)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - Self Weight (PLF)</td>
<td>0 to 13' 1&quot;</td>
<td>N/A</td>
<td>10.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - Uniform (PSF)</td>
<td>0 to 13' 1&quot; (Front)</td>
<td>8&quot;</td>
<td>24.0</td>
<td>80.0</td>
<td>Residential - Living Areas</td>
</tr>
</tbody>
</table>

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---

**Forte Software Operator**

**Job Notes**

Philip Steed  
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12/19/2018 5:33:59 PM  
Forte v5.4, Design Engine: V7.1.1.3  
Replacement members - Forte 4te  
Page 1 of 1
**Member Notes**

Analysis based on length with drop beam installed

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**Design Results**

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<tr>
<th>Design Results</th>
<th>Actual @ Location</th>
<th>Allowed</th>
<th>Result</th>
<th>LDF</th>
<th>Load: Combination (Pattern)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member Reaction (lbs)</td>
<td>607 @ 2 1/2”</td>
<td>2231 (3.50”)</td>
<td>Passed (27%)</td>
<td>--</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>Shear (lbs)</td>
<td>518 @ 1' 3/4”</td>
<td>1665</td>
<td>Passed (31%)</td>
<td>1.00</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>Moment (P-lbs)</td>
<td>2087 @ 7' 3 1/2”</td>
<td>2255</td>
<td>Passed (93%)</td>
<td>1.00</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>Live Load Defl. (in)</td>
<td>0.345 @ 7' 3 1/2”</td>
<td>0.472</td>
<td>Passed (L/493)</td>
<td>--</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>Total Load Defl. (in)</td>
<td>0.448 @ 7' 3 1/2”</td>
<td>0.708</td>
<td>Passed (L/379)</td>
<td>--</td>
<td>1.0 D + 1.0 L (All Spans)</td>
</tr>
<tr>
<td>TJ-Pro™ Rating</td>
<td>N/A</td>
<td>N/A</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

**Supports**

<table>
<thead>
<tr>
<th>Supports</th>
<th>Bearing Length</th>
<th>Loads to Supports (lbs)</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>Available</td>
<td>Required</td>
<td>Dead</td>
</tr>
<tr>
<td>1 - Ledger on masonry - SPF</td>
<td>3.50”</td>
<td>3.50”</td>
<td>1.50”</td>
</tr>
<tr>
<td>2 - Ledger on masonry - SPF</td>
<td>3.50”</td>
<td>3.50”</td>
<td>1.50”</td>
</tr>
</tbody>
</table>

• Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

---

**Loads**

<table>
<thead>
<tr>
<th>Loads</th>
<th>Location (Side)</th>
<th>Spacing</th>
<th>Dead (0.90)</th>
<th>Floor Live (1.00)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Uniform (PSF)</td>
<td>0 to 14’ 7”</td>
<td>19.2”</td>
<td>12.0</td>
<td>40.0</td>
<td>Residential - Living Areas</td>
</tr>
</tbody>
</table>

---

**Forte Software Operator**

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---

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**Design Results**

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<thead>
<tr>
<th>Member Reaction (lbs)</th>
<th>Actual @ Location</th>
<th>Allowed</th>
<th>Result</th>
<th>LDF</th>
<th>Load: Combination (Pattern)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>431 @ 9' 3 1/2&quot;</td>
<td>1271 (1.50&quot;)</td>
<td>Passed (34%)</td>
<td>--</td>
<td>1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans)</td>
</tr>
</tbody>
</table>

**Shear (lbs)**

| Model (Ft-lbs) | 339 @ 8' 10 3/8" | 1459 | Passed (23%) | 1.15 | 1.0 D + 1.0 S (All Spans) |

**Moment (Ft-lbs)**

| Model | 850 @ 4' 9" | 1339 | Passed (63%) | 1.15 | 1.0 D + 1.0 S (All Spans) |

**Live Load Defl. (in)**

| Model | 0.241 @ 4' 9" | 0.428 | Passed (L/639) | -- | 1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans) |

**Total Load Defl. (in)**

| Model | 0.436 @ 4' 9" | 0.642 | Passed (L/354) | -- | 1.0 D + 0.45 W + 0.75 L + 0.75 S (All Spans) |

Design Results are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

**System:** Roof  
**Member Type:** Joist  
**Building Use:** Residential  
**Building Code:** IBC 2015  
**Design Methodology:** ASD  
**Member Pitch: 12/12**

- Deflection criteria: LL (L/360) and TL (L/240).
- Birdsmouth cut has not been analyzed.
- Top Edge Bracing (Lu): Top compression edge must be braced at 11’ 3” o/c unless detailed otherwise.
- Bottom Edge Bracing (Lu): Bottom compression edge must be braced at 13’ 2” 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.

**Connectors:** Simpson Strong-Tie Connectors

<table>
<thead>
<tr>
<th>Support</th>
<th>Bearing Length</th>
<th>Loads to Supports (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Available</td>
</tr>
<tr>
<td>1 - Birdsmouth - SPF</td>
<td>3.50&quot;</td>
<td>3.50&quot;</td>
</tr>
<tr>
<td>2 - Hanger on 7 1/4&quot; SPF beam</td>
<td>3.50&quot;</td>
<td>Hanger¹</td>
</tr>
</tbody>
</table>

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- 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.

**Weyerhaeuser Notes**

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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator.
Main House Basement, wood floor joists, 2018. [STRATA]

D MATERIAL ANALYSIS - WOOD SPECIES TESTING
Philip D. Steed, PE
Structural Engineering Associates, INC.
1000 Walnut, Suite 1750
Kansas City, MO 64106

Dear Mr. Steed,

I received your letter and three specimens taken from the Paul Laurence Dunbar House and Barn located in Dayton, Ohio. The three wood specimens are as follows:

1. House, 1st floor framing joist — species in the white pine group (*Pinus*)
2. House, roof rafter — species in the red pine group (*Pinus*)
3. Barn, hay loft — — species in the white pine group (*Pinus*)

There are many species in the white pine group throughout the world, but only two are commercial in North America — eastern white pine (*Pinus strobus*) and western white pine (*P. monticola*). Although it is not possible to separate the two species based on wood anatomy, I suspect that your specimens are eastern white pine (*Pinus strobus*). Information is listed in the table you provided from the National Design Specification for Wood Construction.

Also there are many species in the red pine group throughout the world, but only one is native to North America — red pine (*P. resinosa*), which is also listed in the table you provided. The other most common species of the red pine group is Scots pine (*P. sylvestris*). This species is native to northern Europe and Asia, but has been planted in the United States for many years.

I did not see any insect or decay damage in the specimens. The growth rate is very slow in specimen 3 (hay loft) and slow to moderately slow in the other two specimens.
Information on the procedures that I used to identify your wood specimens is attached as a separate document. If you have any additional questions, you can email me at rmiller1@wisc.edu or call me on my mobile at 608-213-3217.

Best regards.

/s/ Regis B. Miller

Regis B. Miller, Ph.D.
Wood Identification Procedures

Initially I examine the wood specimens with my naked eye. Next I make a smooth cut with a utility or microtome knife on the cross or transverse section. With a 14X hand lens I examine the transverse section for two major purposes: 1) to determine the orientation of the rays so later I can cut radial and tangential sections, and 2) to see if the wood is a hardwood or softwood (conifer). If it is a hardwood, I examine the patterns formed by the rays, axial parenchyma and vessels. If it is a softwood, there is not much to see, but I do look for resin ducts. Next I orient the wood specimen so that I can cut radial and tangential sections. To cut the sections I use a microtome knife, utility knife, or razor blade. These sections are mounted on a microscope slide using a solution of 50-50 glycerin/ethanol; covered with a cover slip; and boiled on a hot plate to remove air bubbles. The slide is now ready for examination with a light microscope using objectives from 4X to 100X (if necessary). As I examine the wood with my naked eye, hand lens, and microscope, I continue to accumulate information on various features or characters. Sometimes I can identify the wood with just the hand lens (e.g. red and white oak), but most times I make thin sections for use with the light microscope even if I have an idea of the wood name. If I don't know the wood or I am not sure of the identification, I refer to various books, publications, and dichotomous keys. For tropical woods, I often use a computer-assisted wood identification system on called InsideWood.

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
MATERIAL ANALYSIS - HISTORIC PAINT ANALYSIS

Main House, porch ceiling trim, 2018. (STRATA)
On Tuesday, October 30, 2018, David Arbogast, architectural conservator of Davenport, Iowa, received a set of thirteen paint samples from Angie Geist, Gaebler, President, of Strata Architecture + Preservation in Kansas City, Missouri. The samples were collected from the Paul Laurence Dunbar House at the Dayton Aviation Heritage Historical Park in Dayton, Ohio and were submitted in an effort to determine its historic paint colors.

Analysis of the paint samples was completed on Wednesday, November 14, utilizing an optical Amscope microscope with magnification between 7 and 90 power. Each layer observed was color matched to the Munsell System of Color using natural north light. Only opaque, pigmented layers (i.e. paint layers) were matched. It is impossible to determine colors for finishes such as metallic paints and leaves and shellacs and varnishes because their color varies according to their translucency and reflectance.

The Munsell System of Color is a scientific system in which colors have been ranged into a color fan based upon three attributes: hue or color, the chroma or color saturation, and the value or neutral lightness or darkness. Unlike color systems developed by paint manufacturers, the Munsell system provides an unchanging standard of reference which is unaffected by the marketplace and changing tastes in colors.
The hue notation, the color, indicates the relation of the sample to a visually equally spaced scale of 100 hues. There are 10 major hues, five principal and five intermediate within this scale. The hues are identified by initials indicating the central member of the group: red R, yellow-red YR, yellow Y, yellow-green YG, green G, blue-green BG, blue B, purple-blue PB, purple P, and red-purple RP. The hues in each group are identified by the numbers 1 to 10. The most purplish of the red hues, 1 on the scale of 100, is designated as 1R, the most yellowish as 10R, and the central hue as 5R. The hue 10R can also be expressed as 10, 5Y as 25, etc. if a notation of the hue as a number is desired.

Chroma indicates the degree of departure of a given hue from the neutral gray axis of the same value. It is the strength of saturation of color from neutral gray, written /0 to /14 or further for maximum color saturation.

Value, or lightness, makes up the neutral gray axis of the color wheel, ranging from black, number 1, to white at the top of the axis, number 10.

A visual value can be approximated by the help of the neutral gray chips of the Rock or Soil Color chart with ten intervals. The color parameters can be expressed with figures semi-quantitatively as: hue, value/chroma (H, V/C). The color “medium red” should serve as an example for presentation with the three color attributes, 5R 5.5/6. This means that 5R is located in the middle of the red hue, 5.5 is the lightness of Munsell value near the middle between light and dark, and 6 is the degree of the Munsell chroma, or the color saturation, which is about in the middle of the saturation scale.

The samples were submitted in resealable plastic bags with identification information and numbering and locational information written on pieces of paper in the bags. The quality of the samples was challenging, as would be expected given their exterior exposure and the overall history of the building. The discussion of the samples lists the layers from the most recent at the top to the oldest at the bottom. In cases where the actual color was between two Munsell colors, an intermediate number is listed. For example, 10YR 6/5 actually falls between the standard colors of 10YR 6/4 and 10YR 6/6. The results obtained, are as follow:

![Image of a building showing the label 001 - Barn – South Elevation Siding – Gable]
The most recent layer on the first sample was lavender. It was extremely thin, smooth, dirty and contained air bubbles. The next layer down was maroon which was very thin, was smooth to slightly rough and also contained air bubbles. A thick maroon was next. It was also smooth to slightly rough and contained air bubbles. Under it was dark gray which was extremely thin to very thin and a little bit rough. It was cracked. Tan was next down. It was extremely thin, extremely rough and weathered, broken apart and cracked and contained air bubbles. The oldest layer found was light tan. Like the layer above it, it was also extremely thin and extremely rough, broken apart and cracked. The substrate was wood.

Surprisingly, the second sample was comprised of only two layers. The more recent of the two, lavender, was extremely thin, very rough, extremely dirty, weathered and cracked and contained embedded particles as well as air bubbles. Under it was off-white which was also extremely thin and very rough. It was barely perceptible as a layer. The substrate was wood.
The third sample contained four layers, the most recent of which was a thin, bold tan which was basically smooth and contained a lot of air bubbles. Under it was a rough, very bright white which had a variance in thickness from extremely thin to very thin. It also contained air bubbles. The next layer was maroon which was medium thin. Another very bright white appeared next down. It varied in thickness very much like the previous one, but was extremely thin to thin. It was very rough and contained a lot of air bubbles. The oldest layer observed was light brown which was thin, rough, cracked, contained embedded dirt and was also very weathered. The substrate was wood.
The most recent layer of the fourth sample was charcoal-colored and was extremely thin, somewhat rough, glossy and contained air bubbles. Under it were three layers of white before some delamination occurred. All three of the whites were extremely thin and smooth in texture. Another white appeared under the delamination. This one was very thin and smooth. There was more delamination at this point between the layers. Another white was then observed. It was extremely thin and smooth. Under that was an extremely thin to very thin gray layer. Two layers of bright white appeared under the gray layer. The more recent one was very thin and smooth whereas the one under it was extremely thin and smooth. It was apparent that there was a thin and very glossy dark varnish that had been applied to the wooden substrate.
The fifth sample contained probably the most interesting variety of layers thus far observed in the samples. There were three layers of charcoal-colored paint found as the
top three layers. They were the same shade as the most recent layer found in the fourth sample. All three of the charcoal layers in this sample were somewhat rough and contained air bubbles. The topmost one, though, was extremely thin, very dirty, and contained embedded particles. The two under it were very thin. An extremely thin beige layer appeared next down. Under it were two layers of maroon. The more recent one was medium thin and the one under it was thin. They were both smooth in texture. Under that there was some delamination between the layers. An extremely thin aqua layer that contained air bubbles appeared next. Under it was an extremely thin, smooth layer of black. Light brown was the next layer under the black. It was thin and had a variance in texture from smooth to a little bit rough. It also contained air bubbles. Under it was brown, which was very thin, smooth and contained air bubbles. Next down was dark brown which appeared to be an anomaly. It was only found as spots interspersed at approximately this point in the layers. An extremely thin and rough tan layer with air bubbles appeared next down in the layers. Under it were three layers of umber. All of them were thin, but the most recent one also contained embedded particles. At this point in the layers, but not found on all of the pieces was a very thin and rough black which contained air bubbles. The oldest layer then, also not found on all of the pieces of the sample, was a thin dark varnish which on the wooden substrate.

South Elevation - 006 – Porch Siding

Sample 6
Charcoal 5G 3/1
Charcoal 5G 3/1
Gray N 6.0/
Charcoal 5G 3/1
Off-white 5Y 8.5/1
Cream 2.5Y 8/2
Cream 2.5Y 8/2
Off-white 5Y 8.5/1
Off-white 5Y 8.5/1
Off-white 5Y 9/1.5
Off-white 5Y 9/1.5
Off-white 5Y 8.5/1
Off-white 5Y 9/1.5
Gray 10YR 4/1
The sixth sample revealed charcoal-colored paint as the two, most recent layers. Both of them were thin, smooth and contained a lot of air bubbles. The third layer down was an extremely thin and somewhat rough gray. It also contained air bubbles. Under the gray was a thin and smooth charcoal-colored layer which contained a lot of air bubbles. A very thin and a little bit rough off-white layer containing air bubbles was observed next. Under it were two layers of cream-colored paint. The more recent of the two was extremely thin whereas the one under it was just very thin. Beyond that, both of them contained the exact same properties, i.e., they had a texture which varied from smooth to little bit rough, were cracked, contained a lot of dirt and other embedded particles as well as what could be described more like air craters than air bubbles. Under those two layers were six layers of off-white. They had a variance in thicknesses between them, from extremely thin to very thin and were smooth in texture overall, although the most recent one was a little bit rough and contained air bubbles. An extremely thin to very thin gray was the oldest layer on the wooden substrate. It also was broken up and spotty in appearance.
The seventh sample contained nineteen layers. Like the previous sample, the most recent two were charcoal in color. They were both extremely thin and the more recent one was dirty, smooth and contained a lot of air bubbles. Other than being extremely thin, it was not possible to discern any other properties as belonging to the older of the two. Under that was an extremely thin gray layer which had an extremely thin and smooth maroon layer under it. There was another maroon layer which appeared at this point. It was thin and slightly lighter than the one above it. It was also smooth in texture. The same shade of gray as found previously appeared. This one was medium thin and smooth. A bright, extremely thin and somewhat rough white layer appeared next. Light brown was found under that. It appeared to be an anomaly as there was only one, very pronounced spot of it found. It was smooth in texture. Next down was light brown which was extremely thin, somewhat rough and contained a lot of embedded particles. Light gray-brown was found under that. It was thick, rough, contained a lot of embedded particles as well as air bubbles. Dark brown was the next layer down. It was thick and a little bit rough in texture and also contained air bubbles. Two layers of umber were the next layers to be found. Both of them were thin and varied in texture from being smooth to a little bit rough. Dark umber was under them. It was spotty in appearance, but not so much that it could not be considered to be a layer. It was also extremely thin and very rough. A thin, rough, dark brown with a spotty occurrence appeared next down. Under the dark brown were two layers of light brown of a slightly different shade from each other. They were both very thin and extremely rough. The more recent one could almost be considered an anomaly, although it was not because it went on for some length and the older of the two contained air bubbles. The substrate was wood.
South Elevation - 008 – South Crown

<table>
<thead>
<tr>
<th>Sample 8</th>
<th>Munsell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charcoal</td>
<td>5G 3/1</td>
</tr>
<tr>
<td>Charcoal</td>
<td>5G 3/1</td>
</tr>
<tr>
<td>Gray</td>
<td>N 6.0/</td>
</tr>
<tr>
<td>Gray</td>
<td>N 6.0/</td>
</tr>
<tr>
<td>White</td>
<td>N 9.5/</td>
</tr>
<tr>
<td>Off-white</td>
<td>10Y 8.5/1</td>
</tr>
<tr>
<td>Off-white</td>
<td>10Y 8.5/1</td>
</tr>
<tr>
<td>Off-white</td>
<td>10Y 8.5/1</td>
</tr>
<tr>
<td>Light gray-brown</td>
<td>2.5Y 5/2</td>
</tr>
<tr>
<td>Dark brown</td>
<td>2.5Y 3/2</td>
</tr>
<tr>
<td>Umber</td>
<td>5YR 5/6</td>
</tr>
<tr>
<td>Dark umber</td>
<td>5YR 4/4</td>
</tr>
<tr>
<td>Dark brown</td>
<td>2.5YR 3/2</td>
</tr>
</tbody>
</table>

The following are at the same approximate level as the previous three layers:

| Dark gray-brown   | 5Y 4/1          |
| Maroon            | 2.5R 3/4        |
| Light gray-blue   | 10PB 8/1        |

The eighth sample had charcoal-colored paint as the two, most recent layers. They were both very thin and contained air bubbles, although, the more recent one was smooth to a little bit rough and the older one was just smooth. They both contained air bubbles. Under that were two layers of the same shade of gray. They were both extremely thin and smooth. A bright white layer appeared next. It was challenging to see it because it was so very extremely thin. Three thin and smooth layers of the same shade of off-white were the next layers found. A layer of light gray-brown appeared next down. It was thick, rough and contained a lot of embedded particles as well as air bubbles and was somewhat spotty in its appearance. There were so many embedded particles that it almost looked like a different shade of paint. A layer of dark brown was found next. Like the layer above it, it was thick and spotty in occurrence and rough, although it had more of a continuance of being an actual layer than the layer above it. A thin and rough layer of umber was under that. It contained embedded particles. Dark brown, which was thin, rough and of a spotty appearance, was the next layer down. The following layers were at approximately the same level as the previous three layers. Their order is approximate, from most recent to oldest. Dark gray-brown which was a large patch, large enough to be a layer, medium thick, smooth to rough in texture and contained air bubbles. Maroon
was next down. It was also a large patch and was smooth to a little rough in texture. The oldest apparent layer was light gray-blue which was medium thin, also a large patch, very rough and contained a lot of air bubbles. The substrate was wood.

<table>
<thead>
<tr>
<th>Sample 9a</th>
<th>Munsell</th>
<th>Sample 9b</th>
<th>Munsell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charcoal</td>
<td>5G 3/1</td>
<td>Charcoal</td>
<td>5G 3/1</td>
</tr>
<tr>
<td>Charcoal</td>
<td>5G 3/1</td>
<td>Charcoal</td>
<td>5G 3/1</td>
</tr>
<tr>
<td>White</td>
<td>N 9.5/</td>
<td>White</td>
<td>N 9.5/</td>
</tr>
<tr>
<td>Off-white</td>
<td></td>
<td>Off-white</td>
<td>5Y 8.5/1</td>
</tr>
<tr>
<td>Dark brown</td>
<td></td>
<td>Dark brown</td>
<td>2.5Y 3/2</td>
</tr>
<tr>
<td>Dark varnish</td>
<td>--------</td>
<td>Dark varnish</td>
<td>--------</td>
</tr>
</tbody>
</table>

Two discrete samples were designated as 9a and 9b. 9a was from the left jamb and 9b was from the sash. Apart from two older layers they were identical to each other, as can be seen above. Both had two layers of charcoal-colored paint as the most recent layers which were very thin, but beyond that, there were some differences. The most recent layer of charcoal-colored paint on sample 9a was dirty, gritty and somewhat rough and also contained a few air bubbles. The charcoal-colored layer under it was also somewhat
rough and contained a few air bubbles, although it was not possible to determine whether it was dirty or not. The most recent charcoal-colored layer in 9b had the same physical properties as its counterpart but did not appear to have any air bubbles. The charcoal-colored layer under it had a texture that varied from smooth to somewhat rough. A bright white layer was the third layer down in both of the samples. In 9a it was thin, rough and contained air bubbles. In 9b it was extremely thin and rough. The layers of 9b concluded with dark varnish. It appeared to be a complete layer despite the fact that it was so spread apart in its occurrence. Under the white layer in 9b, there was some delamination between the layers. Under that was an off-white layer which was extremely thin and rough. Under it was an extremely thin to very thick dark brown layer which was very rough. There appeared to be dark varnish on sample 9b as the oldest layer. It was more viewable on this sample, but still not observed on all of the edge views. The substrate was wood.

010 – South Elevation – Mullion Between Windows 103/102

<table>
<thead>
<tr>
<th>Sample 10</th>
<th>Charcoal</th>
<th>5G 4/1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charcoal</td>
<td>5G 4/1.5</td>
<td></td>
</tr>
<tr>
<td>Light charcoal</td>
<td>5G 4/1</td>
<td></td>
</tr>
<tr>
<td>Cream</td>
<td>2.5Y 8/4</td>
<td></td>
</tr>
<tr>
<td>Reddish varnish</td>
<td>-------</td>
<td></td>
</tr>
</tbody>
</table>

In the tenth sample, like the most recent two layers of the ninth sample, there were two layers of charcoal-colored paint as the most recent layers. The more recent one was a tiny bit lighter than the ones observed in the previous pair of samples. It also was very thin, had a texture that varied from smooth to somewhat rough and had more air bubbles present than in the samples 9a and 9b. The charcoal-colored layer underneath that was extremely thin. The light charcoal-colored layer was thin, smooth to somewhat rough and contained air bubbles. Under it was one spot of cream found on only one piece of the sample. It could be considered an anomaly because of that. It was thick and very rough. The oldest layer found was some sporadic evidence of a reddish-varnish that had been applied to the wood substrate.
The eleventh sample consisted of eleven layers. The most recent layer was a very thin, smooth to a little rough, beige paint, which also contained air bubbles. Under it was a slightly lighter beige layer which was also very thin, but was smooth. The next layer down was maroon which varied from being extremely thin to very thin and was smooth. The next layer was light gray which varied in thickness from thin to medium thick. It was also rough and contained air bubbles. Under the light gray layer was an off-white layer which was very thin, rough and contained air bubbles. From this point on down the layers proceeded to be broken and cracked. The next two layers down were the same shade of dark green. Both of them were thin, smooth to a little rough and contained air bubbles. Under the dark green layers were two layers of light green, both of which were of medium thin thickness and varied in texture from smooth to rough. A thin, light brown was the next layer. It was rough, broken and cracked. A tan layer was observed as the next layer. It was thin, rough and broken. A very thin golden varnish, which had a spotty occurrence, was the oldest layer on the wooden substrate.
The twelfth sample was comprised of eighteen layers. The most recent layer was an extremely thin, very dirty and very rough charcoal-colored paint that contained a lot of air bubbles. Under it was a cream-colored layer that was very extremely thin to thin, was rough and also contained a lot of air bubbles with the addition of air pockets. The same shade of charcoal-colored paint as the top layer was next. This had a thickness which varied from very thin to thick and contained air bubbles. However, this paint, as compared to the top layer, was smooth in texture. Under that was a light cream-colored layer, which was thin, a little rough and contained air bubbles. Next down was a maroon layer which varied from extremely thin to thin and was smooth in texture. A thin to thick light gray layer was under that. It varied in texture from smooth to a little rough. It also contained embedded particles. Two layers of the same shade of off-white paint were next. They varied in thickness from medium thin to thick, were smooth in texture and contained embedded particles. The same shade of light gray paint as the earlier one in this sample was next down in the layers. It varied from extremely thin to thin, was a
little rough and contained a lot of embedded particles and dirt. Three layers of brown paint were found at this point. The oldest had a slightly darker shade than the two above it. They all had a variance in thickness from extremely thin to somewhat thicker, and were smooth to rough in texture, had a lot of dirt between the layers and were broken. Under the brown layers was a light gray layer which was medium thick, rough, broken and contained a lot of embedded particles as well as black specks. A thin to medium thick, broken gray layer was the next layer down. As in previous layers, it had a lot of embedded particles. Under that was a medium thick to thick, broken umber layer. It had a smooth to rough texture as well as embedded particles. An extremely thin, very broken up and rough light brown paint was next. Under that was a dark brown layer, which varied in thickness from medium thick to thick, and varied in texture from smooth to rough. The oldest layer was dark maroon which was extremely thin to thin, extremely rough, contained a lot of air bubbles and was broken apart. The substrate was wood.

013 – South Elevation – Porch Ironwork

<table>
<thead>
<tr>
<th>Sample</th>
<th>Munsell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 13</td>
<td></td>
</tr>
<tr>
<td>Charcoal</td>
<td>2.5Y 2/2</td>
</tr>
<tr>
<td>Dark brown</td>
<td>2.5Y 3/2</td>
</tr>
<tr>
<td>Extremely dark brown</td>
<td>5Y 2/1</td>
</tr>
<tr>
<td>Dark varnish</td>
<td></td>
</tr>
<tr>
<td>Dark brown</td>
<td>5R 3/4</td>
</tr>
<tr>
<td>Very dark brown</td>
<td>5YR 3/1</td>
</tr>
</tbody>
</table>

The thirteenth sample had a charcoal-colored paint as the most recent layer. It was just a tad darker than the charcoal-colored paint in the previous sample and was thin and smooth to somewhat rough. It also had an extreme gloss to it to the extent that it appeared to be a clear coating which had been applied on top of the paint. The paint contained a lot of air bubbles. There was some delamination between this and the next layer. The dark brown layer was very thin, smooth to rough in texture and contained air bubbles. There was delamination between the layers again under that layer. An extremely dark brown layer was revealed. It was actually darker than the charcoal in this sample. It was thin to medium thick, smooth to somewhat rough and contained air bubbles. Dark, glossy varnish was revealed as the next layer. Dark brown was under the varnish. It was a different shade of brown than had been previously found in this layer and was thin, extremely rough, broken, cracked and contained air bubbles. The oldest layer was very dark brown which was very thin, extremely rough, found as patches, broken, cracked and contained air bubbles. The substrate was ironwork.
The fourteenth sample had charcoal-colored paint as the three most recent layers. All of them were very thin, smooth to a little rough and contained air bubbles. The most recent layer had a lot more air bubbles than the two underneath it. Immediately under those layers was a medium thin, smooth to somewhat rough red layer. The next layer down was a thin and rough gray that contained embedded particles. Under that was a bright white layer which was rough, and contained embedded particles as well as air bubbles. There were three layers of off-white under that. All of them were thin, rough and contained embedded particles. A very thin, rough brown layer containing air bubbles was the next layer down. Under it was a dark brown layer that was thin, was smooth to rough in texture and contained air bubbles. A tan layer was revealed next. It was thin and smooth. Under it was a different shade of dark brown than already found in this sample. It was thin, smooth to rough and broken. The oldest layer on the wood substrate was very dark brown which was very thin and very rough.
The fifteenth sample contained thirteen layers. The most recent two were charcoal-colored. The top one was very thin, a little rough, gritty, dirty and contained air bubbles. The one under it was thin, had a texture that was smooth to a little rough and also contained air bubbles. Two layers of red were under that. They were both thin and smooth. Three layers of off-white were then revealed. All of them were thin, rough and contained embedded particles. A thin, rough gray layer containing air bubbles was found next. Under that was a very thin to thin, rough brown layer that contained embedded particles. Under that brown layer was a dark brown layer which was thin, smooth to rough in texture, contained air bubbles as well as embedded particles. There was a patch of dark glossy varnish found under that which was very thin and contained a lot of embedded particles. The next layer down was umber which was medium thick to thick, broken up, contained embedded particles and air bubbles. The oldest layer found was an extremely thin maroon with a patchy occurrence that was also extremely rough. The substrate was wood.
The sixteenth sample had some similarities to the fifteenth sample, although they were not identical to each other. The most recent layers were two charcoal-colored paints. The more recent of the two was very thin, rough, dirty, gritty and contained air bubbles. The one under it was thin and smooth to a little rough. Two very thin and smooth red layers with an extremely thin and smooth, with a washed-out and cracked pink layer between them was found next. Under the older red was an extremely thin to thin, smooth to rough gray layer which contained embedded particles. Found next down, were three layers of off-white paint which were all thin, rough and contained embedded particles. The one on the bottom of the set had air bubbles. The substrate was wood.
The seventeenth sample was comprised of fifteen layers. The most recent one was a very thin, smooth to somewhat rough, dirty, gritty charcoal-colored paint, which contained air bubbles. There was another charcoal-colored layer under it which was also very thin and contained air bubbles. Two red layers which were very thin and smooth were found next. Three layers of off-white were next down. They were all thin and rough. Of note, only the most recent one contained embedded particles like the off-white layers in the previous sample. Dark tan was the next layer found. It had a slight tinge of orange to it. It was also very thin, smooth to rough in texture and contained embedded particles. Under that was a very thin to thin, smooth to a little bit rough brown layer that contained embedded particles. Next down was a very thin dark brown layer. It had a texture which varied from smooth to rough and contained embedded particles. There was reddish-brown found under that. It was very thin, was smooth to rough in texture and contained air bubbles. Surprisingly, dark green was found as the next layer down. It was extremely thin to very thin in thickness and had a smooth to slightly rough texture. Under that was a strong tan-colored layer which was thin, both smooth and rough, contained embedded particles as well as air bubbles. A very thin and rough dark brown layer was under the strong tan layer. The oldest layer found was a very thin and extremely rough layer of midnight black. There were impressions in it of the striations of the wooden substrate on which it had been applied. It also contained air bubbles and had a high gloss.
The eighteenth sample only contained four layers. The most recent was a fairly bright white which was very thin, smooth and dirty. Under it was off-white layer which was thin, smooth to a little bit rough and contained air bubbles. The next layer under that was dark tan which was extremely thin and rough, and contained embedded particles. The oldest layer found was extremely thin light, golden varnish on the wood substrate.
Like the eighteenth sample, the nineteenth sample did not have very many layers. The most recent two were both fairly bright whites. The more recent one was thin and smooth and contained air bubbles as well as air pockets. Embedded particles were also found in it. The white under it was extremely thin and smooth. The two off-whites under that were both extremely thin and smooth. A thin and rough light, golden varnish was the oldest layer on the wood substrate.

The twentieth sample had an extremely thin layer of smooth to somewhat black as the most recent layer. Under it were three layers of very bright white, all of which were extremely thin and basically smooth. Under them was an off-white layer which was very thin and very smooth. Under that was a cream-colored layer which was very extremely thin and dirty. The three oldest layers were all light tan which were extremely thin and had a texture which varied from smooth to rough. All three also had some tiny particles embedded in them. The substrate for this sample was wood.
The twenty-first sample consisted of only four layers. The most recent brown layer was extremely thin, somewhat rough and very dirty. Under it was a tan layer which was thin, rough and had a lot of air bubbles as well as a lot of embedded particles. Under that was an extremely dark brown layer which could also be considered black. It was thin, rough and contained air bubbles. It also seemed to have some kind of clear glaze on it. Under it was olive green, which was thin, smooth to rough in texture and also contained embedded particles. It too, also seemed to have some kind of clear glaze on it. The oldest layer was an extremely thin varnish on the wooden substrate.
The twenty-second sample had simply one coat of a layer of an exceedingly black paint. It was extremely thin and extremely rough. It appeared to have some kind of clear coat on it. The substrate was wood.
MATERIAL ANALYSIS - ASBESTOS AND LEAD-BASED PAINT SURVEY
Asbestos Survey

Paul Laurence Dunbar House
219 North Paul Laurence Dunbar Street
Dayton, Ohio 45402

August 17, 2018
Terracon Project No. N1187120

Prepared for:
STRATA Architecture + Preservation
Kansas City, Missouri 64108

Prepared by:
Terracon Consultants, Inc.
Cincinnati, Ohio 45226
August 17, 2018

STRATA Architecture + Preservation
1701 Oak Street, Suite 100
Kansas City, Missouri 64108

Attn: Ms. Angie Deist Gaebler, AIA
    President
    P: (816) 474-0900
    E: angie@strata-arch.com

Re: Asbestos Survey Report
    Paul Laurence Dunbar House
    219 North Paul Laurence Dunbar Street
    Dayton, Ohio 45402
    Terracon Project No. N1187120

Dear Ms. Gaebler:

Terracon Consultants, Inc. (Terracon) is pleased to submit the attached report for the above-referenced site to STRATA Architecture + Preservation (Client). The purpose of this report is to present the results of an asbestos survey performed on August 6, 2018 with respect to the above-referenced building which is to be renovated. The survey was conducted in general accordance with your authorization of our proposal number PN1187120, dated April 2, 2018.

Terracon appreciates the opportunity to provide this service to STRATA Architecture + Preservation. If you have any questions regarding this report please contact the undersigned at 513-321-5816.

Sincerely,

Terracon Consultants, Inc.

Joshua Vogel
Project Manager
OH AHES #35291

Joseph A. Tussey, CHMM
Group Manager
OH AHES #32388
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EXECUTIVE SUMMARY

Terracon Consultants, Inc. (Terracon) conducted an asbestos survey of the Paul Laurence Dunbar House (including the barn) located at 219 North Paul Laurence Dunbar Street in Dayton, Ohio. We understand that this survey was requested to satisfy the pre-renovation requirement regarding the federal and state-equivalent EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) regulation 40 CFR Part 61, Subpart M. The survey included identifying and sampling suspect asbestos-containing materials (ACM), and providing information regarding the identity, location, condition, and approximate quantities of ACM in accessible interior and exterior building components (please note, however, that the authorized scope of work did not include the home and barn roofs). The survey was performed on August 6, 2018, two (2) United States Environmental Protection Agency (USEPA)-accredited and Ohio Environmental Protection Agency (OEPA)-certified Asbestos Hazard Evaluation Specialists (AHES) in general accordance with our proposal dated April 2, 2018, and the sampling protocols established in USEPA 40 Code of Federal Regulations (CFR) Part 763, Subpart E, known as the Asbestos Hazard Emergency Response Act (AHERA). Terracon collected a total of 37 bulk samples from 11 homogeneous areas of suspect ACM.

Based on assumptions and laboratory analytical results regarding the samples collected, the materials listed below were identified or assumed to contain asbestos.

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Material Location(s)</th>
<th>% and Type Asbestos</th>
<th>EPA NESHAP Classification</th>
<th>Estimated Quantity*</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Duct Seam Insulating Paper</td>
<td>Home - Basement on hard ductwork, and should be assumed on ducts within wall/floor cavities on first floor leading to first and second floor HVAC vents</td>
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<td>Regulated Asbestos-Containing Material (RACM)</td>
<td>20 Total Square Feet (SF) in Basement (unknown quantity in cavities)</td>
</tr>
<tr>
<td>White Fabric Insulation</td>
<td>Home - Basement west room and laundry room along wood beams</td>
<td>40% Chrysotile</td>
<td>RACM</td>
<td>5 SF</td>
</tr>
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<td>Insulating Heat Shield Board</td>
<td>Home – Basement above HVAC unit</td>
<td>30% Chrysotile</td>
<td>RACM</td>
<td>15 SF</td>
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<td>White Duct Insulation</td>
<td>Home – First floor museum room in closet on hard vertical duct (partially concealed by wall paper applied over the material) and should be assumed on ducts within wall/floor cavities on first floor leading to first and second floor HVAC vents</td>
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<td>White Fireplace Insulation</td>
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<td>RACM</td>
<td>5 SF</td>
</tr>
<tr>
<td>Plaster: Base Coat and Finished Coat**</td>
<td>Home - Throughout walls and ceilings</td>
<td>Assumed</td>
<td>RACM</td>
<td>12,000 SF</td>
</tr>
</tbody>
</table>

*Estimated quantities listed above are based on a cursory field evaluation, and actual quantities may vary significantly, especially if ACMs are present in hidden and/or inaccessible areas not evaluated as part of this survey. This is not a bidding document and contractors would be responsible for drawing their own conclusions on quantities present.
**Due to the historical significance of the home, and given that the plaster walls and ceilings were mostly intact, the Client did not permit Terracon to sample this material in an effort to determine asbestos-content through laboratory analysis; therefore, the plaster walls and ceilings throughout the home must be assumed to contain asbestos until sampled by a state-accredited inspector and laboratory analysis determines otherwise. If future renovation plans will impact only isolated areas of plaster, it is recommended that destructive sampling be conducted at those locations for analysis prior to renovation.

Asbestos-containing materials were not identified as a result of laboratory analysis pertaining to the samples collected from the barn structure.

A summary of samples collected during the survey is included in Appendix B; the laboratory analytical report is attached in Appendix C; and a log showing example photos of identified ACMs is included in appendix E; and sample location drawings are included in Appendix F.

Regarding the identified and assumed ACMs, the owner and/or operator are responsible for EPA NESHAP regulatory compliance prior to renovation and demolition projects. If the identified or assumed ACMs will be impacted by renovation plans, an experienced state-licensed asbestos abatement contractor should be retained for proper removal, handling, and disposal of ACMs which would be impacted by renovation, as applicable with federal and state regulations. Also per federal and state regulations, please be aware that the owner and/or operator must notify the regional/local EPA NESHAP authority 10-business days prior to a renovation project and prior to the removal/encapsulation/enclosure of RACM (friable ACM) exceeding 50 square feet of 50 linear feet. Please contact the Ohio EPA - Regional Air Pollution Control Authority (RAPCA) for further information and discussion regarding regulatory requirement compliance and clarifications (RAPCA, Reibold Building, 117 S. Main Street, Dayton, Ohio 45422; telephone 937-225-4435).

Additionally, please note that the identified exposed asbestos-containing insulation materials listed in the table above and located in the basement and the first-floor museum room closet were observed to be in poor condition. Terracon recommends that these materials, even if not to be impacted by the future renovation project, be considered for removal and/or enclosure/encapsulation (if feasible) by a state-licensed asbestos abatement contractor given their conditions and potential for further damage/deterioration and potential exposure to occupants.

Please note that although the home and barn roofs were excluded from the authorized scope of this survey, roofing materials are often suspect asbestos-containing materials. Although it appeared from ground elevation that the home and barn had non-suspect asbestos-containing slate and wood shingles, underlying felt papers should be assume present and are considered suspect ACM. Therefore, the buildings’ roofs must be assumed to contain asbestos until sampled by an accredited inspector and laboratory analysis determines otherwise. In the future, prior to roof repair or replacement projects, a state-accredited asbestos inspector should sample any suspect asbestos-containing roofing materials for laboratory analysis.
1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) conducted an asbestos survey of the Paul Laurence Dunbar House and barn located at 219 North Paul Laurence Dunbar Street in Dayton, Ohio. The survey was conducted on August 6, 2018, by United States Environmental Protection Agency (USEPA)-accredited and Ohio EPA (OEPA)-certified Asbestos Hazard Evaluation Specialists (AHES) in general accordance with Terracon proposal number PN1187120, dated April 2, 2018. Accessible interior and exterior building components were surveyed (please note, however, that the authorized scope of work did not include the home and barn roofs). Homogeneous areas of suspect asbestos-containing materials (ACM) were visually identified and documented. Although reasonable effort was made to survey accessible suspect materials, additional suspect but un-sampled 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 USEPA 40 Code of Federal Regulations (CFR) Part 763, Subpart E, known as the Asbestos Hazard Emergency Response Act (AHERA). Samples were delivered to an accredited laboratory for analysis by Polarized Light Microscopy (PLM).

1.1 Project Objective

We understand that this survey was requested for the purposes of a future planned renovation of the structures (home and barn) located at the above-referenced address. Please note that asbestos surveys are required prior to renovation or demolition to satisfy requirements of the USEPA 40 CFR Part 61, Subpart M, the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulation (as well as the state NESHAP equivalent).

1.2 Reliance

This report is for the exclusive use of STRATA Architecture + Preservation (Client) 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 proposal, this report, and Terracon’s Agreement for Services. The limitations of liability defined in Terracon’s Agreement for Services is the aggregate limit of Terracon’s liability to STRATA Architecture + Preservation.
2.0 BUILDING DESCRIPTION

The property is an Ohio Historical Site and consists of a two-story, 2,500 square foot brick residential structure with an attic and basement on a stone foundation; the structure is currently used as a museum. The property also has two-story wood barn. The two buildings were reportedly constructed in the late 1800s.

3.0 FIELD ACTIVITIES

The survey was conducted by Mr. Lem Weyer and Mr. Joshua Vogel, USEPA-accredited and OEPA AHESs. A copy of Mr. Weyer’s and Mr. Vogel’s OEPA AHES credential is attached as Appendix D. The survey was conducted in general accordance with the sample collection protocols established in USEPA 40 CFR Part 763, Subpart E, Section 763.86, AHERA. A summary of survey activities is provided below.

3.1 Visual Assessment

Survey activities were initiated with visual observation of the accessible interior and exterior areas of the building (except for the roof as previously noted) to identify homogeneous areas of suspect ACM. A homogeneous area (HA) consists of building materials that appear similar throughout in terms of color and texture with consideration given to the date of application.

3.2 Physical Assessment

A physical assessment of each HA 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 observation, bulk samples of suspect ACM were collected in general accordance with USEPA AHERA sampling protocols. Samples of suspect materials were collected from randomly selected locations 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.

The selection of sample locations and frequency of sampling were based on Terracon’s observations and the assumption that like materials in the same area are homogeneous in content.
Terracon collected a total of 37 bulk samples from 11 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 to International Asbestos Testing Laboratories (IATL) of Mount Laurel, New Jersey for analysis PLM with dispersion staining techniques per USEPA methodology 600/R-93/116. The percentage of asbestos, where applicable, was determined by microscopic visual estimation. When applicable for samples determined by PLM to have a low asbestos content (<10%), the additional point count (PC) method was utilized. IATL is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), accreditation number 101165-0.

4.0 REGULATORY OVERVIEW

The asbestos NESHAP (40 CFR Part 61, Subpart M) regulates asbestos fiber emissions and asbestos waste disposal practices. The asbestos NESHAP regulation also requires the identification and classification of existing ACM according to friability prior to demolition or renovation activity. Friable ACM is a material containing more than 1% asbestos that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. All friable ACM is considered regulated asbestos containing material (RACM).

The asbestos NESHAP regulation classifies material subject to demolition or renovation as either RACM, Category I non-friable ACM, or Category II non-friable ACM. RACM includes all friable ACM (pre-disturbance), along with Category I non-friable ACM that becomes friable (during disturbance), and Category I non-friable ACM subject to sanding, grinding, cutting, or abrading, or Category II non-friable ACM with a high probability of becoming crumbled, pulverized, or reduced to powder by forces expected to act on the material during disturbance. Category I non-friable ACM are exclusively asbestos-containing packings, gaskets, resilient floor coverings, and asphalt roofing products that contain more than 1% asbestos. Category II non-friable ACM are all other non-friable materials (other than Category I non-friable ACM) that contain more than 1% asbestos. Category II non-friable ACM generally includes (but is not limited to) cementitious material such as: cement pipes, cement siding (Transite™), cement panels, glazing, mortar, and grouts.

The Ohio Environmental Protection Agency (OEPA) adopted Chapter 3745-20 of the Ohio Administrative Code and implements the Asbestos NESAHP. The owner or operator must provide the OEPA district office or local air agency with written notification at least 10 business days prior to the commencement of renovation or demolition projects. The OEPA also regulates friable asbestos abatement activities, asbestos personnel training, and issuance of asbestos professional certifications under OAC 3745-22. OEPA audits asbestos abatement projects and responds to public health emergencies where friable ACMs has been released; licensed contractors must submit a 10-business day notification prior to an abatement project where friable
ACMs in quantities greater than 50 linear or 50 square feet are being removed. Please note that per OEPA regulations, non-friable floor tile if broken into pieces four (4) square inches or smaller are considered friable, and thus as a RACM.

Montgomery County, Ohio also has an “hazardous air pollution control regulation” known as Regulation 150. The regulation is similar to OEPA’s regulations; however, the county should be contacted prior to any abatement activities to ensure full compliance as this regulation may be more strict than federal and state regulations.

The United States Occupational Safety and Health Administration (USOSHA) asbestos standard for construction (29 CFR 1926.1101) regulates workplace exposure to asbestos. The USOSHA standard requires that employee exposure to airborne asbestos must not exceed 0.1 fibers per cubic centimeter of air (0.1 f/cc) as an eight-hour time weighted average (TWA) and not exceed 1.0 fibers per cubic centimeter of air (1.0 f/cc) over a 30-minute time period known as an excursion limit (EL). The TWA and EL are known as USOSHA’s asbestos permissible exposure limits (PELs). The USOSHA 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.

5.0 FINDINGS AND RECOMMENDATIONS

Based on assumptions and laboratory analytical results regarding the samples collected, the materials listed below were identified or assumed to contain asbestos.

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<tr>
<th>Material Description</th>
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Asbestos Survey
Paul Laurence Dunbar House ■ Dayton, OH
August 17, 2018 ■ Terracon Project No. N1187120

Estimated quantities listed above are based on a cursory field evaluation, and actual quantities may vary significantly, especially if ACMs are present in hidden and/or inaccessible areas not evaluated as part of this survey. This is not a bidding document and contractors would be responsible for drawing their own conclusions on quantities present.

Due to the historical significance of the home, and given that the plaster walls and ceilings were mostly intact, the Client did not permit Terracon to sample this material in an effort to determine asbestos-content through laboratory analysis; therefore, the plaster walls and ceilings throughout the home must be assumed to contain asbestos until sampled by a state-accredited inspector and laboratory analysis determines otherwise. If future renovation plans will impact only isolated areas of plaster, it is recommended that destructive sampling be conducted at those locations for analysis prior to renovation.

Asbestos-containing materials were not identified as a result of laboratory analysis pertaining to the samples collected from the barn structure.

A summary of samples collected during the survey is included in Appendix B; the laboratory analytical report is attached in Appendix C; and a log showing example photos of identified ACMs is included in appendix E; and sample location drawings are included in Appendix F.

Regarding the identified and assumed ACMs, the owner and/or operator are responsible for EPA NESHAP regulatory compliance prior to renovation and demolition projects. If the identified or assumed ACMs will be impacted by renovation plans, an experienced state-licensed asbestos abatement contractor should be retained for proper removal, handling, and disposal of ACMs which would be impacted by renovation, as applicable with federal and state regulations. Also per federal and state regulations, please be aware that the owner and/or operator must notify the regional/local EPA NESHAP authority 10-business days prior to a renovation project and prior to the removal/encapsulation/enclosure of RACM (friable ACM) exceeding 50 square feet of 50 linear feet. Please contact the Ohio EPA - Regional Air Pollution Control Authority (RAPCA) for further information and discussion regarding regulatory requirement compliance and clarifications (RAPCA, Reibold Building, 117 S. Main Street, Dayton, Ohio 45422; telephone 937-225-4435). Montgomery County, Ohio should also be contacted prior to any asbestos abatement activities, as county Regulation 150 may have more strict requirements than federal and state regulations.

Additionally, please note that the identified exposed asbestos-containing insulation materials listed in the table above and located in the basement and the first-floor museum room closet were observed to be in poor condition. Terracon recommends that these materials, even if not to be impacted by the future renovation project, be considered for removal and/or enclosure/encapsulation (if feasible) by a state-licensed asbestos abatement contractor given their conditions and potential for further damage/deterioration and potential exposure to occupants.

Please note that although the home and barn roofs were excluded from the authorized scope of this survey, roofing materials are often suspect asbestos-containing materials. Although it appeared from ground elevation that the home and barn had non-suspect asbestos-containing slate and wood shingles, underlying felt papers should be assume present and are considered suspect ACM. Therefore, the buildings' roofs must be assumed to contain asbestos until sampled by an accredited inspector and laboratory analysis determines otherwise. In the future, prior to
roof repair or replacement projects, a state-accredited asbestos inspector should sample any suspect asbestos-containing roofing materials for laboratory analysis.

6.0 LIMITATIONS/GENERAL COMMENTS

In addition to limitations, if any, indicated in other sections of this report, please not that Terracon did not perform sampling which required demolition or destructive activities such as knocking large holes in walls, dismantling of equipment or removal of protective coverings. 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.

This asbestos 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 of the building. The information contained in this report is relevant to the date 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 STRATA Architecture + Preservation 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 quantities, 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.
### APPENDIX A

**Paul Laurence Dunbar House**

219 Paul Laurence Dunbar Street
Dayton, Ohio 45402

**Identified Asbestos-Containing Materials by Homogeneous Area (HA)**

<table>
<thead>
<tr>
<th>HA No.</th>
<th>Material Description</th>
<th>Material Location(s)</th>
<th>% and Type Asbestos</th>
<th>Material Location(s)</th>
<th>Condition</th>
<th>EPA NESHAP Classification</th>
<th>Material Location(s)</th>
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</tr>
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<tr>
<td>1</td>
<td>White Duct Seam Insulating Paper</td>
<td>Home - Basement on hard ductwork, and should be assumed on ducts within wall/floor cavities on first floor leading to first and second floor HVAC vents</td>
<td>35% Chrysotile</td>
<td>EPA NESHAP Classification</td>
<td>Poor</td>
<td>Regulated Asbestos-Containing Material (RACM)</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
</tr>
<tr>
<td>2</td>
<td>White Fabric Insulation</td>
<td>Home - Basement west room and laundry room along wood beams</td>
<td>40% Chrysotile</td>
<td>EPA NESHAP Classification</td>
<td>Poor</td>
<td>Regulated Asbestos-Containing Material (RACM)</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
</tr>
<tr>
<td>3</td>
<td>Insulating Heat Shield Board</td>
<td>Home - Basement above HVAC unit</td>
<td>30% Chrysotile</td>
<td>EPA NESHAP Classification</td>
<td>Poor</td>
<td>Regulated Asbestos-Containing Material (RACM)</td>
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<td>RACM</td>
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<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
</tr>
<tr>
<td>4</td>
<td>White Duct Insulation</td>
<td>Home - Basement on hard ductwork, and should be assumed on ducts within wall/floor cavities on first floor leading to first and second floor HVAC vents</td>
<td>35% Chrysotile</td>
<td>EPA NESHAP Classification</td>
<td>Poor</td>
<td>Regulated Asbestos-Containing Material (RACM)</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
</tr>
<tr>
<td>5</td>
<td>White Duct Insulation</td>
<td>Home - First floor museum room in closet on hard vertical duct (partially concealed by wall paper applied over the material), and should be assumed on ducts within wall/floor cavities on first floor leading to first and second floor HVAC vents</td>
<td>35% Chrysotile</td>
<td>EPA NESHAP Classification</td>
<td>Poor</td>
<td>Regulated Asbestos-Containing Material (RACM)</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
<td></td>
<td>Poor</td>
<td>RACM</td>
</tr>
<tr>
<td>6</td>
<td>White Fireplace Insulation</td>
<td>Home - First floor museum room and front parlor rooms inside fireplaces</td>
<td>30% Chrysotile</td>
<td>EPA NESHAP Classification</td>
<td>Assumed</td>
<td>Regulated Asbestos-Containing Material (RACM)</td>
<td></td>
<td>Assumed</td>
<td>RACM</td>
<td></td>
<td>Assumed</td>
<td>RACM</td>
<td></td>
<td>Assumed</td>
<td>RACM</td>
</tr>
<tr>
<td>7</td>
<td>Plaster: Base Coat and Finished Coat</td>
<td>Home - Throughout walls and ceilings</td>
<td>Assumed</td>
<td>EPA NESHAP Classification</td>
<td>Assumed</td>
<td>Regulated Asbestos-Containing Material (RACM)</td>
<td></td>
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<td>RACM</td>
<td></td>
<td>Assumed</td>
<td>RACM</td>
<td></td>
<td>Assumed</td>
<td>RACM</td>
</tr>
</tbody>
</table>

See Appendix B for a summary of samples collected, Appendix C for detailed analytical results, Appendix D for photo examples of ACMs, and Appendix F for sample location maps.
*Estimated quantities listed above are based on a cursory field evaluation, and actual quantities may vary significantly, especially if ACMs are present in hidden and/or inaccessible areas not evaluated as part of this survey. This is not a bidding document and contractors would be responsible for drawing their own conclusions on quantities present.

**Due to the historical significance of the home, and given that the plaster walls and ceilings were mostly intact, the Client did not permit Terracon to sample this material in an effort to determine asbestos-content through laboratory analysis; therefore, the plaster walls and ceilings throughout the home must be assumed to contain asbestos until sampled by a state-accredited inspector and laboratory analysis determines otherwise. If future renovation plans will impact only isolated areas of plaster, it is recommended that destructive sampling be conducted at those locations for analysis prior to renovation.

It should be noted that inaccessible/concealed suspect materials, other than those identified during this survey, may exist. Should additional suspect materials be uncovered prior to or during renovation or demolition activities, those materials must be assumed asbestos-containing until sampled by an Ohio AHES and analysis can confirm or deny their asbestos content. Additionally, please note that although the roof was excluded from the authorized scope of this survey, roofing materials must be assumed to contain asbestos until sampled by an accredited inspector and laboratory analysis determines otherwise. In the future prior to roof replacement or repair, roofing materials would need to be evaluated for suspect ACM.
APPENDIX B

Paul Laurence Dunbar House
219 Paul Laurence Dunbar Street
Dayton, Ohio 45402

ASBESTOS SURVEY SAMPLE SUMMARY

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Sample Material Description</th>
<th>Sample Location</th>
<th>HA Location(s)</th>
<th>Results (% / Type of Asbestos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White Duct Seam Insulating Paper Sealant</td>
<td>Northwest Side of Laundry Room</td>
<td>House - Throughout home on seams of hard ducts (exposed in basement; presumed hidden in wall floor cavities)</td>
<td>35% Chrysotile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Northeast Side of Laundry Room</td>
<td></td>
<td>35% Chrysotile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>North of HVAC Unit</td>
<td></td>
<td>35% Chrysotile</td>
</tr>
<tr>
<td>2</td>
<td>White Fabric Insulation</td>
<td>East Side of West Room</td>
<td>House - West Room and Laundry Room of Basement along Beams</td>
<td>40% Chrysotile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>East Side of West Room</td>
<td></td>
<td>40% Chrysotile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>West Side of Laundry Room</td>
<td></td>
<td>40% Chrysotile</td>
</tr>
<tr>
<td>3</td>
<td>Insulating Heat Shield Board</td>
<td>Northwest Corner of HVAC Unit</td>
<td>House - Above HVAC Unit in Basement</td>
<td>30% Chrysotile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Northwest Corner of HVAC Unit</td>
<td></td>
<td>30% Chrysotile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Northeast Corner of HVAC Unit</td>
<td></td>
<td>30% Chrysotile</td>
</tr>
<tr>
<td>4</td>
<td>Water Sealant on Basement Walls</td>
<td>Northwest Corner of West Room</td>
<td>House - Interior Perimeter Walls of Basement</td>
<td>None-Detected (ND)</td>
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<tr>
<td></td>
<td></td>
<td>Southeast Corner of Laundry Room</td>
<td></td>
<td>ND</td>
</tr>
<tr>
<td>Sample #</td>
<td>Sample Material Description</td>
<td>Sample Location</td>
<td>HA Location(s)</td>
<td>Results (% / Type of Asbestos)</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------</td>
<td>-----------------</td>
<td>----------------</td>
<td>------------------------------</td>
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<tr>
<td>012</td>
<td></td>
<td>Center of North</td>
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<tr>
<td></td>
<td></td>
<td>Wall in Furnace</td>
<td>House -</td>
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<tr>
<td></td>
<td></td>
<td>Room</td>
<td>Throughout the</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>house on vertical</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Duct Work – in</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>first floor</td>
<td></td>
</tr>
<tr>
<td>013</td>
<td></td>
<td>Northeast Corner</td>
<td></td>
<td>ND</td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>of Coal Room</td>
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<td>House -</td>
<td>35% Chrysotile</td>
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<tr>
<td>016</td>
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<td>Closet</td>
<td>Throughout the</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>house on vertical</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Duct Work – in</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>first floor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>museum room</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td>closet, presumed</td>
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<td></td>
<td></td>
<td></td>
<td>in wall/floor</td>
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<tr>
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<td></td>
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<td>cavities as well</td>
<td></td>
</tr>
<tr>
<td>017</td>
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<td>Museum Room</td>
<td></td>
<td>35% Chrysotile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Closet</td>
<td></td>
<td></td>
</tr>
<tr>
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<tr>
<td></td>
<td></td>
<td>in Attic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>019</td>
<td></td>
<td>Southeast Corner</td>
<td></td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of Attic</td>
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<td></td>
</tr>
<tr>
<td>020</td>
<td></td>
<td>Northeast Corner</td>
<td></td>
<td>ND</td>
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<tr>
<td></td>
<td></td>
<td>of Attic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>021</td>
<td></td>
<td>Middle of Attic</td>
<td></td>
<td>ND</td>
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<td></td>
<td>Northwest Corner</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>of Attic</td>
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<tr>
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<td></td>
<td>- South Window</td>
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<tr>
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<td></td>
<td></td>
<td>South Window</td>
<td></td>
<td></td>
</tr>
<tr>
<td>025</td>
<td></td>
<td>First Floor –</td>
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<td>ND</td>
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<td></td>
<td>- Basement Hatch</td>
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</tr>
<tr>
<td></td>
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<td>Side</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>House -</td>
<td>ND</td>
</tr>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sample #</td>
<td>Sample Material Description</td>
<td>Sample Location</td>
<td>HA Location(s)</td>
<td>Results (% / Type of Asbestos)</td>
</tr>
<tr>
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<td>-----------------------------</td>
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<td>027</td>
<td>Inside of Door - Basement Hatch Side</td>
<td></td>
<td></td>
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<td>028</td>
<td>Inside of Door - Basement Hatch Side</td>
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<td>029</td>
<td>Gray Exterior Window Caulking</td>
<td>West Side of Dining Room Window</td>
<td>All Exterior Windows of the Home</td>
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<td>East Side of Dining Room Window</td>
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<tr>
<td>031</td>
<td>Gray Exterior Window Caulking</td>
<td>West Side of Office Window</td>
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<td>033</td>
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<td>Dining Room Window</td>
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<td>ND</td>
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<tr>
<td>034</td>
<td>Gray Exterior Window Caulking</td>
<td>Dining Room Window</td>
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<td>035</td>
<td>White Fireplace Insulation</td>
<td>On Metals Slats of Fireplace Behind Metal Grate</td>
<td>House - Fireplace in Den</td>
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<td>036</td>
<td>White Fireplace Insulation</td>
<td>On Metals Slats of Fireplace Behind Metal Grate</td>
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<tr>
<td>037</td>
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<td>On Metals Slats of Fireplace Behind Metal Grate</td>
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APPENDIX C

ASBESTOS ANALYTICAL LABORATORY DATA
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<tr>
<th>Lab No.: 6576551</th>
<th>Analyst Observation:</th>
<th>White Wrap</th>
<th>Location:</th>
<th>Northwest Side Of Laundry Room</th>
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<tbody>
<tr>
<td>Client No.: 1-001</td>
<td>Client Description:</td>
<td>White Duct Sealant</td>
<td>Facility:</td>
<td>Percent Non-Fibrous Material:</td>
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<td>Percent Asbestos:</td>
<td>Percent Non-Asbestos Fibrous Material:</td>
<td>35 Chrysotile</td>
<td>55 Cellulose</td>
<td>10</td>
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<th>Analyst Observation:</th>
<th>White Wrap</th>
<th>Location:</th>
<th>Northwest Side Of Laundry Room</th>
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</thead>
<tbody>
<tr>
<td>Client No.: 1-002</td>
<td>Client Description:</td>
<td>White Duct Sealant</td>
<td>Facility:</td>
<td>Percent Non-Fibrous Material:</td>
</tr>
<tr>
<td>Percent Asbestos:</td>
<td>Percent Non-Asbestos Fibrous Material:</td>
<td>35 Chrysotile</td>
<td>55 Cellulose</td>
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<th>Lab No.: 6576553</th>
<th>Analyst Observation:</th>
<th>White Wrap</th>
<th>Location:</th>
<th>North Of HVAC Unit</th>
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<td>Client No.: 1-003</td>
<td>Client Description:</td>
<td>White Duct Sealant</td>
<td>Facility:</td>
<td>Percent Non-Fibrous Material:</td>
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<td>Percent Non-Asbestos Fibrous Material:</td>
<td>35 Chrysotile</td>
<td>55 Cellulose</td>
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<th>Lab No.: 6576554</th>
<th>Analyst Observation:</th>
<th>White Wrap</th>
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<td>Client No.: 2-004</td>
<td>Client Description:</td>
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<td>Facility:</td>
<td>Percent Non-Fibrous Material:</td>
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<tr>
<td>Percent Asbestos:</td>
<td>Percent Non-Asbestos Fibrous Material:</td>
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<td>25 Cellulose</td>
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<table>
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<th>Lab No.: 6576555</th>
<th>Analyst Observation:</th>
<th>White Wrap</th>
<th>Location:</th>
<th>East Side Of West Room</th>
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</thead>
<tbody>
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<td>Client No.: 2-005</td>
<td>Client Description:</td>
<td>White Fabric</td>
<td>Facility:</td>
<td>Percent Non-Fibrous Material:</td>
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<td>Percent Asbestos:</td>
<td>Percent Non-Asbestos Fibrous Material:</td>
<td>40 Chrysotile</td>
<td>25 Cellulose</td>
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<th>Lab No.: 6576556</th>
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<th>White Wrap</th>
<th>Location:</th>
<th>West Side Of Laundry Room</th>
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<tbody>
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<td>Client No.: 2-006</td>
<td>Client Description:</td>
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<td>Facility:</td>
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<td>Percent Non-Asbestos Fibrous Material:</td>
<td>40 Chrysotile</td>
<td>25 Cellulose</td>
<td>35</td>
</tr>
</tbody>
</table>

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 8/7/2018
Date Analyzed: 08/08/2018
Signature: [Signature]
Analyst: Terrence Mulhern

Dated : 8/14/2018 10:29:57
Page 1 of 10
<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Analyst Observation</th>
<th>Percent Asbestos</th>
<th>Client Description</th>
<th>Location</th>
<th>Percent Non-Fibrous Material</th>
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<tr>
<td>6576557</td>
<td>White Fibrous</td>
<td>30 Chrysotile</td>
<td>Unfinished Gypsum Board</td>
<td>Northwest Corner Of HVAC Unit</td>
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<tr>
<td>3-007</td>
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<td>Facility:</td>
<td></td>
</tr>
<tr>
<td>6576558</td>
<td>White Fibrous</td>
<td>30 Chrysotile</td>
<td>Unfinished Gypsum Board</td>
<td>Northwest Corner Of HVAC Unit</td>
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</tr>
<tr>
<td>3-008</td>
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<td>Unfinished Gypsum Board</td>
<td>Northeast Corner Of HVAC Unit</td>
<td>60</td>
</tr>
<tr>
<td>3-009</td>
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<td>Facility:</td>
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<tr>
<td>6576560</td>
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<td>Facility:</td>
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<td>Northwest Corner Of West Room</td>
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<td>Facility:</td>
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<td>Southeast Corner Of Laundry Room</td>
<td>99</td>
</tr>
<tr>
<td>4-011</td>
<td></td>
<td></td>
<td></td>
<td>Facility:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Percent Non-Asbestos Fibrous Material: 1 Cellulose</td>
<td></td>
</tr>
</tbody>
</table>

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 8/7/2018

Date Analyzed: 08/08/2018

Signature: Terrence Mulhern

Approved By: Frank E. Ehrenfeld, III
Laboratory Director
<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Client No.</th>
<th>Analyst Observation</th>
<th>Client Description</th>
<th>Location</th>
<th>Facility</th>
<th>Percent Asbestos:</th>
<th>Percent Non-Asbestos Fibrous Material:</th>
<th>Percent Non-Fibrous Material:</th>
</tr>
</thead>
<tbody>
<tr>
<td>6576562</td>
<td>4-012</td>
<td>Grey Cementitious</td>
<td>Water Sealant On Basement Walls</td>
<td>Center Of North Wall In Furnace Room</td>
<td>None Detected</td>
<td>None Detected</td>
<td>None Detected</td>
<td>None Detected</td>
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<tr>
<td>6576563</td>
<td>4-013</td>
<td>Grey Cementitious</td>
<td>Water Sealant On Basement Walls</td>
<td>Northeast Corner Of Basement</td>
<td>None Detected</td>
<td>None Detected</td>
<td>None Detected</td>
<td>None Detected</td>
</tr>
<tr>
<td>6576564</td>
<td>4-014</td>
<td>Grey Cementitious</td>
<td>Water Sealant On Basement Walls</td>
<td>Southwest Corner Of Coal Room</td>
<td>None Detected</td>
<td>None Detected</td>
<td>None Detected</td>
<td>None Detected</td>
</tr>
<tr>
<td>6576565</td>
<td>5-015</td>
<td>White/Grey Wrap</td>
<td>White Duct Insulation</td>
<td>Museum Room Closet</td>
<td>35 Chrysotile</td>
<td>50 Cellulose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6576566</td>
<td>5-016</td>
<td>White/Grey Wrap</td>
<td>White Duct Insulation</td>
<td>Museum Room Closet</td>
<td>35 Chrysotile</td>
<td>50 Cellulose</td>
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<td></td>
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<tr>
<td>6576567</td>
<td>5-017</td>
<td>White/Grey Wrap</td>
<td>White Duct Insulation</td>
<td>Museum Room Closet</td>
<td>35 Chrysotile</td>
<td>50 Cellulose</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please refer to the Appendix of this report for further information regarding your analysis.
### PLM BULK SAMPLE ANALYSIS SUMMARY

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Analyst Observation</th>
<th>Client Description</th>
<th>Location</th>
<th>Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>6576568</td>
<td>Brown Insulation</td>
<td>Brown Blown-In Insulation</td>
<td>West Of Steps In Attic</td>
<td></td>
</tr>
<tr>
<td>6-018</td>
<td>None Detected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6576569</td>
<td>Brown Insulation</td>
<td>Brown Blown-In Insulation</td>
<td>Southeast Corner Of Attic</td>
<td></td>
</tr>
<tr>
<td>6-019</td>
<td>None Detected</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6576570</td>
<td>Brown Insulation</td>
<td>Brown Blown-In Insulation</td>
<td>Northeast Corner Of Attic</td>
<td></td>
</tr>
<tr>
<td>6-020</td>
<td>None Detected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6576571</td>
<td>Brown Insulation</td>
<td>Brown Blown-In Insulation</td>
<td>Middle Attic</td>
<td></td>
</tr>
<tr>
<td>6-021</td>
<td>None Detected</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6576572</td>
<td>Brown Insulation</td>
<td>Brown Blown-In Insulation</td>
<td>Northwest Corner Of Attic</td>
<td></td>
</tr>
<tr>
<td>6-022</td>
<td>None Detected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6576573</td>
<td>White Glazing</td>
<td>White Exterior Window Glazing</td>
<td>Second Floor-South Window</td>
<td></td>
</tr>
<tr>
<td>7-023</td>
<td>None Detected</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percent Asbestos: None Detected

Percent Non-Asbestos Fibrous Material:
- 55 Mineral Wool
- 40 Cellulose

Percent Non-Fibrous Material:
- 5

Please refer to the Appendix of this report for further information regarding your analysis.
### PLM BULK SAMPLE ANALYSIS SUMMARY

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Client No.</th>
<th>Analyst Observation</th>
<th>Client Description</th>
<th>Location</th>
<th>Percent Asbestos</th>
<th>Percent Non-Asbestos Fibrous Material</th>
<th>Percent Non-Fibrous Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>6576574</td>
<td>7-024</td>
<td>White Glazing</td>
<td>White Exterior Window Glazing</td>
<td>First Floor-South Window</td>
<td>None Detected</td>
<td>None Detected</td>
<td></td>
</tr>
<tr>
<td>6576575</td>
<td>7-025</td>
<td>White Glazing</td>
<td>White Exterior Window Glazing</td>
<td>Fist Floor-West Window</td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576576</td>
<td>8-026</td>
<td>White Glazing</td>
<td>White Interior Door Glazing</td>
<td>Inside Of Door-Basement Hatch Side</td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576577</td>
<td>8-027</td>
<td>White Glazing</td>
<td>White Interior Door Glazing</td>
<td>Inside Of Door-Basement Hatch Side</td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576578</td>
<td>8-028</td>
<td>White Glazing</td>
<td>White Interior Door Glazing</td>
<td>Inside Of Door-Basement Hatch Side</td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576579</td>
<td>9-029</td>
<td>Grey Caulk</td>
<td>Grey Exterior Window Caulking</td>
<td>West Side Of Dining Room Window</td>
<td>None Detected</td>
<td>2 Cellulose</td>
<td>98</td>
</tr>
</tbody>
</table>

Please refer to the Appendix of this report for further information regarding your analysis.
### PLM BULK SAMPLE ANALYSIS SUMMARY

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Client No.</th>
<th>Analyst Observation</th>
<th>Client Description</th>
<th>Location</th>
<th>Facility</th>
<th>Percent Asbestos</th>
<th>Percent Non-Asbestos Fibrous Material</th>
<th>Percent Non-Fibrous Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>6576580</td>
<td>9-030</td>
<td>Grey Caulk</td>
<td>Grey Exterior Window Caulking</td>
<td>East Side Of Dining Room Window</td>
<td></td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576581</td>
<td>9-031</td>
<td>Grey Caulk</td>
<td>Grey Exterior Window Caulking</td>
<td>West Side Of Office Window</td>
<td></td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576582</td>
<td>10-032</td>
<td>Grey Caulk</td>
<td>Grey Exterior Window Caulking</td>
<td>Dining Room Window</td>
<td></td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576583</td>
<td>10-033</td>
<td>Grey Caulk</td>
<td>Grey Exterior Window Caulking</td>
<td>Dining Room Window</td>
<td></td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576584</td>
<td>10-034</td>
<td>Grey Caulk</td>
<td>Grey Exterior Window Caulking</td>
<td>Dining Room Window</td>
<td></td>
<td>None Detected</td>
<td>1 Cellulose</td>
<td>99</td>
</tr>
<tr>
<td>6576585</td>
<td>11-035</td>
<td>White Insulation</td>
<td>White Fireplace Insulation</td>
<td>On Metal Slats Of Fireplace Behind Metal Grate</td>
<td></td>
<td>30% Chrysotile</td>
<td>35 Cellulose</td>
<td>35</td>
</tr>
</tbody>
</table>

Please refer to the Appendix of this report for further information regarding your analysis.
<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Analyst Observation</th>
<th>Client Description</th>
<th>Location</th>
<th>Facility</th>
<th>Percent Asbestos</th>
<th>Percent Non-Asbestos Fibrous Material</th>
<th>Percent Non-Fibrous Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>6576586</td>
<td>White Insulation</td>
<td>White Fireplace Insulation</td>
<td>On Metal Slats Of Fireplace</td>
<td>Behind Metal Grate</td>
<td>30 Chrysotile</td>
<td>35 Cellulose</td>
<td></td>
</tr>
<tr>
<td>6576587</td>
<td>White Insulation</td>
<td>White Fireplace Insulation</td>
<td>On Metal Slats Of Fireplace</td>
<td>Behind Metal Grate</td>
<td>30 Chrysotile</td>
<td>35 Cellulose</td>
<td></td>
</tr>
</tbody>
</table>

Please refer to the Appendix of this report for further information regarding your analysis.
## Appendix to Analytical Report

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

**iATL Customer Service:** customerservice@iatl.com  
**iATL Office Manager:** cdavis@iatl.com  
**iATL Account Representative:** Cassie Doherty  
**Sample Login Notes:** See Batch Sheet Attached  
**Sample Matrix:** Bulk Building Materials  
**Exceptions Noted:** See Following Pages

### General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

### Information Pertinent to this Report:


**Certifications:***  
- NIST-NVLAP No. 101165-0  
- NYSDOH-ELAP No. 11021  
- AIHA-LAP, LLC No. 100188

Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. PC Trace represents a <0.25% amount. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analytical Methodology Alternatives: Your initial request for analysis may not have accounted for recent advances in regulatory requirements or advances in technology that are routinely used in similar situations for other qualified projects. You may have the option to explore additional analysis for further information. Below are a few options, listed as the matrix followed by the appropriate methodology. Also included are links to more information on our website.

- Bulk Building Materials that are Non-Friable Organically Bound (NOB) by Gravimetric Reduction techniques employing PLM and TEM: ELAP 198.6 (PLM-NOB), ELAP 198.4 (TEM-NOB)

Dated: 8/14/2018 10:29:57
Sprayed On Insulation/Fireproofing with Vermiculite (SOF-V): ELAP 198.8 (PLM-SOF-V)

Soil, sludge, sediment, aggregate, and like materials analyzed for asbestos or other elongated mineral particles (ex. erionite, etc.): ASTM D7521, CARB 435, and other options available

Asbestos in Surface Dust according to one of ASTM's Methods (very dependent on sampling collection technique – by TEM): ASTM D 5755, D5756, or D6480

Various other asbestos matrices (air, water, etc.) and analytical methods are available.

Disclaimers / Qualifiers:
There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a list with highlighted disclaimers that may be pertinent to this project. For a full explanation of these and other disclaimers, please inquire at customerservice@iatl.com.

1) Note: No mastic provided for analysis.
2) Note: Insufficient mastic provided for analysis.
3) Note: Insufficient material provided for analysis.
4) Note: Insufficient sample provided for QC reanalysis.
5) Note: Different material than indicated on Sample Log / Description.
6) Note: Sample not submitted.
7) Note: Attached to asbestos containing material.
8) Note: Received wet.
9) Note: Possible surface contamination.
10) Note: Not building material. 1% threshold may not apply.
11) Note: Recommend TEM-NOB analysis as per EPA recommendations.
12) Note: Asbestos detected but not quantifiable.
13) Note: Multiple identical samples submitted, only one analyzed.
14) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.080%.
15) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.125%.
16) Note: This sample contains >10% vermiculite mineral. See Appendix for Recommendations for Vermiculite Analysis.

Recommendations for Vermiculite Analysis:

Several analytical protocols exist for the analysis of asbestos in vermiculite. These analytical approaches vary depending upon the nature of the vermiculite mineral being tested (e.g. un-processed gange, homogeneous exfoliated books of mica, or mixed mineral composites). Please contact your client representative for pricing and turnaround time options available.

iATL recommends initial testing using the EPA 600/R-93/116 method. This method is specifically designed for the analysis of asbestos in bulk building materials. It provides an acceptable starting point for primary screening of vermiculite for possible asbestos.

Results from this testing may be inconclusive. EPA suggests proceeding to a multi-tiered analysis involving wet separation techniques in conjunction with PLM and TEM gravimetric analysis (EPA 600/R-04/004).

For New York State customers, NYSDOH requires disclaimers and qualifiers for various vermiculite containing samples that direct analysis via ELAP198.6 and ELAP198.8 for samples that contain >10% vermiculite mineral where ELAP198.6 may be used to evaluate the asbestos content of the material. However, any test result using ELAP198.6 will be reported with the following disclaimer: “ELAP198.6 method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing >10% vermiculite.”

Further information on this method and other vermiculite and asbestos issues can be found at the following: Agency for Toxic Substances and Disease Registry (ATSDR) www.atsdr.cdc.gov, United States Geological Survey (USGS) www.minerals.usgs.gov/minerals/, US EPA www.epa.gov/asbestos. The USEPA also has an informative brochure "Current Best Practices for Vermiculite Attic Insulation" EPA 747F03001 May 2003, that may assist the health and remediation professional.

The following is a summary of the analytical process outlines in the EPA 600/R-04/004 Method:

1) Analytical Step/Method: Initial Screening by PLM, EPA 600R-93/116
   Requirements/Comments: Minimum of 0.1 g of sample. ~0.25% LOQ for most samples.

2) Analytical Step/Method: Wet Separation by PLM Gravimetric Technique, EPA R-04/004
   Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

Dated: 8/14/2018 10:29:57  Page 9 of 10
3) **Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
   **Requirements/Comments:** Minimum 50g** of dry sample. Analysis of "Floats" only.

4) **Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
   **Requirements/Comments:** Minimum 50g** of dry sample. Analysis of "Sinks" only.

5) **Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
   **Requirements/Comments:** Minimum 50g** of dry sample. Analysis of "Suspension" only.

LOQ, Limit of Quantitation estimates for mass and volume analyses.
*With advance notice and confirmation by the laboratory.
**Approximately 1 Liter of sample in double-bagged container (~9x6 inch bag of sample).
# Chain of Custody

## Bulk Asbestos

### Contact Information

<table>
<thead>
<tr>
<th>Client Company</th>
<th>Project Number</th>
<th>Project Name</th>
<th>Primary Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terracon Consultants, Inc.</td>
<td>N1187120</td>
<td>Paul Dunbar House</td>
<td>Joshua Vogel</td>
</tr>
<tr>
<td>611 Lunken Park Drive</td>
<td></td>
<td></td>
<td>513-612-9085</td>
</tr>
<tr>
<td>Cincinnati, OH 45226</td>
<td></td>
<td></td>
<td>Cell Phone: 513-332-5034</td>
</tr>
<tr>
<td>Fax Number: 513-321-0294</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email Address: <a href="mailto:joshua.vogel@terracon.com">joshua.vogel@terracon.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PLM Instructions:

- [ ] PLM: Bulk Asbestos Building Materials EPA 600 R-93/116, 1993
- [ ] PLM: Bulk Asbestos Building Materials EPA 600 M-4/82-020, 1982
- [ ] PLM: Bulk Asbestos Building Materials NIOSH 9002, 1985
- [ ] PLM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.1, 2002
- [ ] PLM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.6, 2010
- [ ] TEM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.4, 2009

### Special Instructions:

- [ ] PLM: Analyze Until Positive (Positive Stop)
- [ ] AUP: by Homogenous Area as Noted
- [ ] AUP: by Material Type as Noted
- [ ] PLM: NOB via EPA 198.6
- [ ] PLM: Friable via EPA 600 2.3
- [ ] If <1% by PLM, to TEM via 198.4 *
- [ ] If <1% by PLM, Hold for Instructions
- [ ] PLM: Non-Building Material ***(Dust, Wipe, Tape)
- [ ] Soil or Vermiculite Analysis
- [ ] CARB 435

*Additional charge and turnaround may be required  **Alternative Method (ex: EPA 600/R-04/004) may be recommended by Laboratory

### Turnaround Time

<table>
<thead>
<tr>
<th>Preliminary Results Requested Date:</th>
<th>Specific date / time</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] 10 Day</td>
<td>[ ] 5 Day</td>
</tr>
</tbody>
</table>

*End of next business day unless otherwise specified. **Matrix Dependent. ***Please notify the lab before shipping***

### Chain of Custody

<table>
<thead>
<tr>
<th>Re linquished (Name/Organization):</th>
<th>Date:</th>
<th>Time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received (Name / iATL):</td>
<td>Date:</td>
<td>Time:</td>
</tr>
<tr>
<td>Sample Login (Name / iATL):</td>
<td>Date:</td>
<td>Time:</td>
</tr>
<tr>
<td>Analysis(Name(s) / iATL):</td>
<td>Date:</td>
<td>Time:</td>
</tr>
<tr>
<td>QA/QC Review (Name / iATL):</td>
<td>Date:</td>
<td>Time:</td>
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<tr>
<td>Archived / Released:</td>
<td>Date:</td>
<td>Time:</td>
</tr>
<tr>
<td>QA/QC InterLAB Use:</td>
<td>Date:</td>
<td>Time:</td>
</tr>
</tbody>
</table>

Celebrating 25 years... one sample at a time
www.iatl.com
Chain of Custody
–Bulk Asbestos–

Contact Information
Client Company: Terracon Consultants, Inc.
Office Address: 611 Lunken Park Drive
City, State, Zip: Cincinnati, OH 45226
Fax Number: 513-321-0294
Email Address: joshua.vogel@terracon.com

Project Number: N1187120
Project Name: Paul Dunbar House
Primary Contact: Joshua Vogel
Office Phone: 513-612-9085
Cell Phone: 513-332-5034

PLM Instructions:
- PLM: Bulk Asbestos Building Materials EPA 600 R-93/116, 1993
- PLM: Bulk Asbestos Building Materials EPA 600 M-4/82-020, 1982
- PLM: Bulk Asbestos Building Materials NIOSH 9002, 1985
- PLM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.1, 2002
- PLM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.6, 2010
- TEM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.4, 2009

- PLM: Point Counting
  - PC: via ELAP 198.1
  - PC: 400 Points
  - PC: 800 Points *
  - PC: 1600 Points *

- PLM: Instructions for Multi-Layered Samples
  - Analyze and Report All Separable Layers per EPA 600
  - Report Composite for Drywall Systems per NESHAP
  - Report All Layers and Composite Where Applicable
  - Only Analyze and Report Specifically Noted Layer

Special Instructions:
- PLM: Analyze Until Positive (Positive Stop)
- AUP: by Homogenous Area as Noted
- AUP: by Material Type as Noted
- PLM: NOB via 198.6
- PLM: Friable via EPA 600 2.3
- If <1% by PLM, to TEM via 198.4 *
- If <1% by PLM, Hold for Instructions
- PLM: Non-Building Material *** (Dust, Wipe, Tape)
- Soil or Vermiculite Analysis
- CARB 435

* Additional charge and turnaround may be required  ** Alternative Method (ex: EPA 600/R-04/004) may be recommended by Laboratory

Turnaround Time
Preliminary Results Requested Date: ____________________________

- Verbal
- Email
- Fax
- □ 10 Day  □ 5 Day  □ 3 Day  □ 2 Day  □ 1 Day*  □ 12 Hour**  □ 6 Hour**  □ RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

Chain of Custody
Relinquished (Name/Organization):
Received (Name / iATL):
Sample Login (Name / iATL):
Analysis(Name(s) / iATL):
QA/QC Review (Name / iATL):
Archived / Released: QA/QC InterLAB Use:

Date: 08-20-18  Time:
Date: 8/18/18  Time:
Date: 8/13/18  Time:
Date: 8/18/18  Time:

Celebrating 25 years...one sample at a time
www.iatl.com
<table>
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Login

From: Eric Snyder <ericsnyder@iatl.com>
Sent: Monday, August 06, 2018 6:35 PM
To: login@iatl.com
Subject: FW: N1187120 Bulk Log
Attachments: N1187120- ACM Bulk Log.doc

In case you haven't received yet...

Eric M. Snyder
President
International Asbestos Testing Laboratories, Inc.
9000 Commerce Parkway, Suite B
Mt. Laurel, NJ 08054
P: 856 231-9449
www.iatl.com

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From: Vogel, Joshua [mailto:Joshua.Vogel@terracon.com]
Sent: Monday, August 06, 2018 3:40 PM
To: customerservice@iatl.com
Subject: N1187120 Bulk Log

Please see attached ACM Bulk Log. Samples will be shipped today or tomorrow for 5 day turn around.

Joshua Vogel
Project Manager | Asbestos & IH Services
Terracon Consultants, Inc.
611 Lunken Park Dr. I Cincinnati, OH 45226
O 513-612-9002 I M 859-512-7475
joshua.vogel@terracon.com | www.terracon.com

ENR Rankings | 2017
Terracon provides environmental, facilities, geotechnical, and materials consulting engineering services delivered with responsiveness, resourcefulness, and reliability.

Private and confidential as detailed here (www.terracon.com/privacy-policy). If you cannot access hyperlink, please e-mail sender.
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APPENDIX D

LICENSES AND CERTIFICATIONS
January 30, 2018

Joshua Vogel  
Terracon  
611 Lunken Park Drive  
Cincinnati OH 45226

RE: Asbestos Hazard Evaluation Specialist  
Certification Number: ES35291  
Expiration Date: 03/03/2019

Dear Joshua Vogel:

This letter and enclosed certification card approves your request to be certified as an Asbestos Hazard Evaluation Specialist. You must present your card upon request at any project site while performing duties. Copies of cards are not acceptable as proof of certification.

This certification may be revoked by the Director of the Environmental Protection Agency for violation of any of the requirements of 3745-22 or 3745-20 of the Ohio Administrative Code.

If you have any questions, please call 614-644-0226.

Sincerely,

Mark Needham  
Manager, Asbestos Program  
Division of Air Pollution Control
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Certificate of Accreditation to ISO/IEC 17025:2005

International Asbestos Testing Laboratories

NVLAP LAB CODE: 101165-0
Mt. Laurel, NJ

Effective Dates
2018-07-01 through 2019-06-30

Asbestos Fiber Analysis

This laboratory is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for: Asbestos Fiber Analysis.

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).

For the National Voluntary Laboratory Accreditation Program

Effective Dates
2018-07-01 through 2019-06-30
SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

International Asbestos Testing Laboratories
9000 Commerce Parkway
Suite B
Mt. Laurel, NJ 08054
Mr. Frank E. Ehrenfeld III
Phone: 856-231-9449  Fax: 856-231-9818
Email: frankehrenfeld@iatl.com
http://www.iatl.com

ASBESTOS FIBER ANALYSIS

Bulk Asbestos Analysis

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Airborne Asbestos Analysis

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For the National Voluntary Laboratory Accreditation Program

Effective 2018-07-01 through 2019-06-30
APPENDIX E

PHOTOS
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<th>Photo #2 HA 2: Asbestos-Containing White Fabric Insulation.</th>
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<td>Photo #3 HA 3: Asbestos-Containing Insulating Heat Shield Board.</td>
<td>Photo #4 HA 5: Asbestos-Containing White Duct Insulation.</td>
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<td>Photo #5 HA 11: Asbestos-Containing White Fireplace Insulation.</td>
<td>Photo #6 HA N/A: Assumed Asbestos-Containing Plaster: Base Coat and Finished Coat.</td>
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APPENDIX F

SAMPLE LOCATION MAPS
Sample Location Drawing – House First Floor
Sample Location Drawing – House Attic Level
Sample Location Drawing – Barn First Floor
Sample Location Drawing – Barn Second Floor
August 22, 2018

STRATA Architecture + Preservation
1701 Oak Street, Suite 100
Kansas City, Missouri 64108

Attn: Ms. Angie Deist Gaebler, AIA
President
P: (816) 474-0900
E: angie@strata-arch.com

Re: Limited Lead-Containing Paint and Soil Survey
Paul Laurence Dunbar House
219 North Paul Laurence Dunbar Street
Dayton, Ohio 45402
Terracon Project No. N1187120

Dear Ms. Gaebler,

Terracon Consultants, Inc. (Terracon) appreciates the opportunity to submit this letter report to STRATA Architecture + Preservation (Client) regarding the analytical results for limited lead-containing paint (LCP) and lead in soil sampling which was conducted at the Paul Laurence Dunbar House (Site) located at 219 Paul Laurence Dunbar Street in Dayton, Ohio. The Site consists of a two-story residential home (now used as a museum) and a barn; both were reported as constructed in the late 1800s.

We understood the purpose of the sampling was to determine the presence of lead by laboratory analysis in select paint-coated surfaces and soil prior to future renovation. Additionally, we understood the purpose of this sampling was to provide information to potential contractors so that they could take the necessary precautions to comply with applicable worker safety regulations, particularly United States Occupational Safety and Health Administration (USOSHA) regulation 20 Code of Federal Regulations (CFR) 1926.62 (Lead in Construction). This scope of work was not meant to be a surface-by-surface investigation of all paints/varnish or sampling of all bare soils for compliance with US Housing and Urban Development (HUD) lead guidelines, or state and federal regulations pertaining to private residential structures or schools.

On August 6, 2018, Mr. Joshua Vogel and Mr. Lem Weyer of Terracon collected paint chip samples from select surfaces as directed by the Client, and soil samples from around the buildings. Client-directed paint chip samples were collected using a clean straight-edge razor to remove paint from designated surfaces. One composite soil sample was collected along the dripline (foundation) of each building (barn and house) for lead-content analysis. Collected paint chip and soil samples were placed in sealable containers, labeled with unique sample numbers,
and submitted under chain of custody to International Asbestos Testing Laboratories (IATL) in Mount Laurel, New Jersey. Paint chip samples were submitted for analysis per ASTM D3335-85a and soil samples were submitted for analysis per EPA Method SW846/3050B/7000B. IATL is accredited for lead analysis under the National Lead Laboratory Accreditation Program (NLLAP).

During the August 6, 2018 site visit, the Client determined that paint/varnish on certain surfaces shouldn’t be sampled to preserve coating and substrate integrity. Therefore, Terracon made a return site visit on August 16, 2018 to conduct non-destructive paint/varnish sampling using an X-Ray Fluorescence Analyzer (XRF). Mr. Joseph A. Tussey of Terracon, an Ohio-licensed lead risk assessor and trained/experienced XRF user, conducted limited testing using the XRF instrument. The XRF analyzer is a direct-read instrument capability of determine lead in milligrams per centimeter square (mg/cm\(^2\)) at relatively high concentrations, but not very effective for determining concentrations of lead that may exist in paint/varnish at lower concentrations. Relative to USOSHA compliance, the most effective manner in determining concentration of lead in a paint/varnish sample would be only through sample collection and laboratory analysis. Therefore, any paints/varnish readings by XRF as 0.0 mg/cm\(^2\) should be considered as inclusive, with the recommendation for sample collection and laboratory analysis as the only effective way of determining actual lead-content.

**LCP Laboratory Analytical & XRF Testing Results Summary**

Terracon collected a total of 12 paint chip samples from Client-designation locations for lead-content laboratory analysis from the house and barn. A sample summary which includes sample locations and analytical results are attached (Attachment 1). Detectable concentrations of lead are presented with results as milligrams per kilogram (mg/kg) / parts per million (ppm). The laboratory analytical report and sample chain of custody are also attached (Attachment 4).

The XRF instrument used was a Niton XLp 300 Series XRF Analyzer, serial number 81582. The XRF detection limit (DL) was set to 1.0 mg/cm\(^2\) as per manufacturer’s specifications. The XRF unit is designed to take a measurement with a 95% confidence down to a level of 0.2 mg/cm\(^2\). XRF readings below 0.2 mg/cm\(^2\) cannot be used conclusively to determine the presence/absence of lead in paint. Further analysis of samples via laboratory analysis is recommended for clarification of the presence or absence of lead if results are below 0.2 mg/cm\(^2\). If no lead is detected in a sample by laboratory analysis (not by XRF), then the OSHA Lead in Construction Standard does not apply to that surface. Surfaces with XRF readings below 0.2 mg/cm\(^2\), with no paint chip sampling and laboratory analysis conducted must be assumed to contain lead.

XRF field screening results and locations are noted on the table included Attachment 2. The table contains the type of component tested, the condition of the paint (“Intact”, “Fair” or “Poor”), the type of substrate (such as wood, metal, etc.) and the color of the component. The locations of the individual tests are listed with corresponding lead results in (mg/cm\(^2\)) as reported by the XRF. The detailed report represents all XRF readings of coated surfaces tested.
Lead-Containing Paint and Soil Sampling
Paul Laurence Dunbar House ■ Dayton, OH
August 22, 2018 ■ Terracon Project No. N1187120

Lead in Soils Analytical Results Summary

Terracon collected a total of two composite soil samples for lead-content analysis from the house and barn (one from the house and one from the barn). Each sample was collected in areas along the dripline/foundation of the buildings. Bare soil means soil or sand not covered by grass, sod, other live ground covers, wood chips, gravel, artificial turf, or similar covering. Dripline/foundation area means the area within three feet of the building wall surrounding the perimeter of a building. A total of ten subsamples were collected and composited to make each sample. Generally, subsamples were collected no closer than 1 ft. (0.3 m) and no farther apart than 3 ft. (1.0 m), but exceptions to this general rule were made due to the due to wide variations in the pattern and extent of bare soil. Sub-samples were collected using new plastic centrifuge tubes to a depth approximately ½ in. below the ground surface. New, clean disposal gloves were used between the two composite sample locations. A sample summary which includes sample locations and analytical results are attached. Detectable concentrations of lead are presented with results as mg/kg / ppm. The laboratory analytical report and sample chain of custody are also attached.

Findings
Lead was identified above the analytical limit of detection (LOD) for 10 of the 12 paint chip samples collected; these samples are described in the attached sample summary table. The XRF instrument detected the presence of lead above 0.2 mg/cm² in 53 of 67 paint/varnish locations tested.

USOSHA 29 CFR 1926.62 (Lead in Construction), does not reference a specific concentration of lead in a surface coating for applicability of compliance. The requirements under OSHA 29 CFR 1926.62 are applicable to any concentration of lead found above analytical LOD. When disturbed, paints containing lead in any concentration represent an airborne exposure hazard that could exceed the OSHA legally enforceable action level (AL) or permissible exposure limit (PEL). Contractors that bid or conduct work activities that will disturb surfaces with analytically-confirmed LCP should be made aware of those so that they can plan for proper compliance with applicable federal and state regulations, and any applicable Client specifications. Additionally, contractors should be aware that any untested paint surfaces should be assumed to also contain lead unless sampling and analysis refute lead-content.

Lead was detected in both composite soil samples collected and analyzed. The composite soil sample collected from the home’s dripline/foundation had a result of 550 mg/kg (ppm) lead, and the soil sample collected from the barn’s dripline/foundation had a result of 700 mg/kg (ppm) lead. For reference, the USEPA’s thresholds for lead in soil hazards is 400 mg/kg (ppm) for play areas, 1,200 mg/kg (ppm) for other bare soil areas in the remainder of a yard. Interim control measures are a typical manner recommended by the USEPA for addressing bare soil areas with lead; interim measures consist of approaches such as seeding/sodding, mulching, paving with stones, gravel, concrete, etc.
This sampling event was conducted as per the direction and request of the Client. The sampling was of a limited nature specific to prominent and readily accessible painted surfaces and may not have included every painted surface. The sampling 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 and recommendations expressed in this letter report are based on conditions observed during the sampling event. This letter report has been prepared on behalf of and exclusively for use and reliance by the Client and is not a bidding document. Contractors or consultants reviewing this limited sampling report must draw their own conclusions regarding whether further investigation or remediation is 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.

Terracon appreciates the opportunity to provide this service to STRATA Architecture + Preservation. If you have questions regarding this letter report or if we can be of further service, please contact Joshua Vogel at (513) 612-9002.

Sincerely,

Terracon Consultants, Inc.

Joshua Vogel               Michael Crandall, CIH
Project Manager            Senior Industrial Hygienist

Attachments: Paint Chip Sample Summary
XRF Summary
Soil Sample Summary
Laboratory Analytical Report
Attachment 1: Lead Paint Chip Sample Summary
<table>
<thead>
<tr>
<th>Terracon Sample #</th>
<th>Component</th>
<th>Paint Color (surface)</th>
<th>Substrate</th>
<th>Sample Location</th>
<th>Comments / Results Lead (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>Wall</td>
<td>White</td>
<td>Brick</td>
<td>Basement Southeast Corner of Laundry</td>
<td>&lt; Limit of Detection (LOD)</td>
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<tr>
<td>L2</td>
<td>Wall/Door</td>
<td>White</td>
<td>Wood</td>
<td>Basement Northside of Coal Room Door</td>
<td>&lt; LOD</td>
</tr>
<tr>
<td>L3</td>
<td>Wall</td>
<td>White</td>
<td>Concrete</td>
<td>Basement North Side of Laundry Room</td>
<td>120</td>
</tr>
<tr>
<td>L4</td>
<td>Stairs</td>
<td>Brown</td>
<td>Wood</td>
<td>Top Step of Attic</td>
<td>84,000</td>
</tr>
<tr>
<td>L5</td>
<td>Wall</td>
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<td>Wood</td>
<td>West of Top Step of Attic</td>
<td>9,300</td>
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<tr>
<td>L6</td>
<td>Door Frame</td>
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<td>Wood</td>
<td>At Entrance of Kitchen</td>
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</tr>
<tr>
<td>L7</td>
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</tr>
<tr>
<td>L8</td>
<td>Door</td>
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<td>Wood</td>
<td>Back Door outside the House</td>
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</tr>
<tr>
<td>L9</td>
<td>Door Frame</td>
<td>Tan</td>
<td>Wood</td>
<td>Above Entry on Door Frame of Barn Bedroom</td>
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</tr>
<tr>
<td>L10</td>
<td>Barn Siding</td>
<td>Tan</td>
<td>Wood</td>
<td>South Side of Barn on top of Eve</td>
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<tr>
<td>L11</td>
<td>Pipe</td>
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<td>Metal</td>
<td>Sewage Vent Pipe in Basement Stairway Room</td>
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<tr>
<td>L12</td>
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<td>Green</td>
<td>Wood</td>
<td>Dining Room Window on Exterior of House</td>
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Attachment 2: XRF Sample Summary
<table>
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<th>Terracon Sample #</th>
<th>Component</th>
<th>Paint Color (surface)</th>
<th>Substrate</th>
<th>Condition</th>
<th>Sample Location</th>
<th>Comments / Results Lead (mg/cm²)</th>
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</thead>
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<tr>
<td>980</td>
<td>Paint</td>
<td>Start Calibration (should be within 1.2 and 0.8 range)</td>
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<td>Museum Room</td>
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<td>983</td>
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<tr>
<td>987</td>
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<td>Gold</td>
<td>Metal</td>
<td>Good</td>
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<td>988</td>
<td>Door Frame</td>
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<td>Wood</td>
<td>Good</td>
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<tr>
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<td>Door</td>
<td>Varnish</td>
<td>Wood</td>
<td>Good</td>
<td>Museum Room Closet</td>
<td>0.02</td>
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<tr>
<td>990</td>
<td>Wall Trim</td>
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<td>Wood</td>
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</tr>
<tr>
<td>991</td>
<td>Base Board</td>
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<td>Good</td>
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<tr>
<td>992</td>
<td>Door</td>
<td>Varnish</td>
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<td>Good</td>
<td>Interior of Front Door</td>
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<tr>
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<td>Good</td>
<td>Interior of Front Door</td>
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<tr>
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<td>Wood</td>
<td>Good</td>
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<td>0.04</td>
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<td>Wood</td>
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<td>0.07</td>
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<td>Dining Room Near Window</td>
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<td>Good</td>
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<td>1000</td>
<td>Window Sash</td>
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<td>Wood</td>
<td>Good</td>
<td>South Window of Dining Room</td>
<td>0.03</td>
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<tr>
<td>1001</td>
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<td>Wood</td>
<td>Good</td>
<td>Kitchen Near South Window</td>
<td>0.03</td>
</tr>
<tr>
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<td>Window Sill</td>
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<td>Wood</td>
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<td>South Window of Kitchen</td>
<td>0.09</td>
</tr>
<tr>
<td>1003</td>
<td>Window Frame</td>
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<td>Wood</td>
<td>Good</td>
<td>South Window of Kitchen</td>
<td>0.05</td>
</tr>
<tr>
<td>Terracon Sample #</td>
<td>Component</td>
<td>Paint Color (surface)</td>
<td>Substrate</td>
<td>Condition</td>
<td>Sample Location</td>
<td>Comments / Results Lead (mg/cm²)</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------</td>
<td>-----------------------</td>
<td>-----------</td>
<td>-----------</td>
<td>----------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
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<td>Window Sash</td>
<td>Varnish</td>
<td>Wood</td>
<td>Good</td>
<td>South Window of Kitchen</td>
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</tr>
<tr>
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<td>Wall</td>
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<tr>
<td>1006</td>
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<td>Wood</td>
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<td>Back Porch</td>
<td>0.01</td>
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<tr>
<td>1007</td>
<td>Window Sill</td>
<td>White</td>
<td>Wood</td>
<td>Good</td>
<td>Back Porch South Window</td>
<td>Inconclusive</td>
</tr>
<tr>
<td>1008</td>
<td>Window Frame</td>
<td>White</td>
<td>Wood</td>
<td>Good</td>
<td>Back Porch South Window</td>
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<tr>
<td>1009</td>
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<td>Back Porch South Window</td>
<td>1.9</td>
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<td>White</td>
<td>Wood</td>
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<td>Back Porch</td>
<td>0.1</td>
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<td>1011</td>
<td>Wall</td>
<td>White</td>
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<td>Back Porch</td>
<td>Inconclusive</td>
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<tr>
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<td>White</td>
<td>Wood</td>
<td>Good</td>
<td>Back Porch</td>
<td>Inconclusive</td>
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<tr>
<td>1013</td>
<td>Cabinet</td>
<td>Varnish</td>
<td>Wood</td>
<td>Good</td>
<td>Pantry</td>
<td>Inconclusive</td>
</tr>
<tr>
<td>1014</td>
<td>Wall</td>
<td>Blue</td>
<td>Plaster</td>
<td>Good</td>
<td>Pantry</td>
<td>1.2</td>
</tr>
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<tr>
<td>1016</td>
<td>Door</td>
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<td>Wood</td>
<td>Good</td>
<td>Kitchen/Dining Room Connection Door</td>
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</tr>
<tr>
<td>1017</td>
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<td>Wood</td>
<td>Good</td>
<td>Kitchen/Dining Room Connection Door</td>
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</tr>
<tr>
<td>1018</td>
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<td>Varnish</td>
<td>Wood</td>
<td>Good</td>
<td>Dining Room on South Wall</td>
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<td>Wall</td>
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<td>Plaster/Wall Paper</td>
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<tr>
<td>1021</td>
<td>Stair Tread</td>
<td>Varnish</td>
<td>Wood</td>
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<td>2nd Step to 2nd Floor</td>
<td>0.5</td>
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<tr>
<td>1022</td>
<td>Stair Riser</td>
<td>Varnish</td>
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<td>Good</td>
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<td>Good</td>
<td>2nd Step to 2nd Floor</td>
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<td>1024</td>
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<td>At Bottom of Hand Rail</td>
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<td>1025</td>
<td>Wood Railing</td>
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<td>Good</td>
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<tr>
<td>1026</td>
<td>Knoll Post</td>
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<tr>
<td>Terracon Sample #</td>
<td>Component</td>
<td>Paint Color (surface)</td>
<td>Substrate</td>
<td>Condition</td>
<td>Sample Location</td>
<td>Comments / Results Lead (mg/cm²)</td>
</tr>
<tr>
<td>------------------</td>
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<td>1027</td>
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<td>South Side of Front Porch</td>
<td>4.9</td>
</tr>
<tr>
<td>1035</td>
<td>Metal Beams</td>
<td>Green</td>
<td>Metal</td>
<td>Good</td>
<td>Middle Beam on Front Porch</td>
<td>0.15</td>
</tr>
<tr>
<td>1036</td>
<td>Gutter</td>
<td>Green</td>
<td>Metal</td>
<td>Good</td>
<td>South Side of Front Porch</td>
<td>21.4</td>
</tr>
<tr>
<td>1037</td>
<td>Metal Beam</td>
<td>Green</td>
<td>Metal</td>
<td>Good</td>
<td>Southeast Corner of Front Porch</td>
<td>0.23</td>
</tr>
<tr>
<td>1038</td>
<td>Soffit</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>Middle of South End of Front Porch</td>
<td>11.3</td>
</tr>
<tr>
<td>1039</td>
<td>Mail Box</td>
<td>Black</td>
<td>Metal</td>
<td>Good</td>
<td>North Wall of House</td>
<td>0.03</td>
</tr>
<tr>
<td>1040</td>
<td>Floor</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>Middle of Front Porch</td>
<td>Inconclusive</td>
</tr>
<tr>
<td>1041</td>
<td>Window Sash</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>East Windows of Parlor</td>
<td>0.08</td>
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<tr>
<td>1042</td>
<td>Window Sash</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>East Windows of Parlor</td>
<td>0.11</td>
</tr>
<tr>
<td>1043</td>
<td>Window Sash</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>East Windows of Parlor</td>
<td>2.1</td>
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<tr>
<td>1044</td>
<td>Window Frame</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>East Windows of Parlor</td>
<td>3.2</td>
</tr>
<tr>
<td>1045</td>
<td>Shutter</td>
<td>Green</td>
<td>Wood</td>
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<td>Near East Windows of Parlor</td>
<td>0.23</td>
</tr>
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<td>1046</td>
<td>Down Spout</td>
<td>Green</td>
<td>Metal</td>
<td>Good</td>
<td>Near Back Porch</td>
<td>26.7</td>
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<tr>
<td>1047</td>
<td>Siding</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>South Wall of Back Porch</td>
<td>8.0</td>
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<tr>
<td>1048</td>
<td>Window Sash</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>Exterior of the East Middle Window of Back Porch</td>
<td>2.7</td>
</tr>
<tr>
<td>Terracon Sample #</td>
<td>Component</td>
<td>Paint Color (surface)</td>
<td>Substrate</td>
<td>Condition</td>
<td>Sample Location</td>
<td>Comments / Results Lead (mg/cm²)</td>
</tr>
<tr>
<td>------------------</td>
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<tr>
<td>1049</td>
<td>Window Frame</td>
<td>Green</td>
<td>Wood</td>
<td>Good</td>
<td>Exterior of the East Middle Window of Back Porch</td>
<td>6.7</td>
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<tr>
<td>1050</td>
<td></td>
<td>End Calibration</td>
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<td></td>
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<td>1.0</td>
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<tr>
<td>1051</td>
<td></td>
<td>End Calibration</td>
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<td></td>
<td></td>
<td>1.1</td>
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<td>1052</td>
<td></td>
<td>End Calibration</td>
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<td>1.2</td>
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</table>
Attachment 3: Lead Soil Sample Summary
<table>
<thead>
<tr>
<th>Terracon Sample #</th>
<th>Component</th>
<th>Surrounding Structure</th>
<th>Sample Location</th>
<th>Comments / Results Lead (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pb-S-1</td>
<td>Soil</td>
<td>Residential Home</td>
<td>Composite Sample of North Drip Line and Foundation of the North End of the Home</td>
<td>550</td>
</tr>
<tr>
<td>Pb-S-2</td>
<td>Soil</td>
<td>Barn</td>
<td>Composite Sample of the Drip Line and Foundation of all Surrounding Sides of the Barn</td>
<td>700</td>
</tr>
</tbody>
</table>
Attachment 4: Laboratory Analytical Report
CERTIFICATE OF ANALYSIS

Client: Terracon
611 Lunken Park Drive
Cincinnati OH 45226

Client: TER940

Lab No.: 6576369
Client No.: PbS-01
Location: House
Result (mg/kg): 550*

Lab No.: 6576370
Client No.: PbS-02
Location: Barn
Result (mg/kg): 700*

LEAD SOIL SAMPLE ANALYSIS SUMMARY

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 8/7/2018
Date Analyzed: 08/14/2018
Signature: Chad Shaffer

Approved By: Frank E. Ehrenfeld, III
Laboratory Director

Dated: 8/14/2018 3:24:44
Page 1 of 3
Appendix to Analytical Report:

**Customer Contact:**

**Method:** AAS - EPA SW 846 3050B / 7000B(Soil)

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

**iATL Customer Service:** customerservice@iatl.com
**iATL Office Manager:** cdavis@iatl.com
**iATL Account Representative:** Cassie Doherty

**Project Summary:**

**Sample Login Notes:** See Batch Sheet Attached
**Sample Matrix:** Soil
**Exceptions Noted:** See Following Pages

**General Terms, Warrants, Limits, Qualifiers:**

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

**Information Pertinent to this Report:**

Analysis by AAS: EPA SW 8463050B / 7000B (Soil)
CERTIFICATE OF ANALYSIS

Client: Terracon
611 Lunken Park Drive
Cincinnati OH 45226

Client: TER940

Report Date: 8/14/2018
Report No.: 570075 - Lead Soil
Project: Paul Dunbar House
Project No.: N1187120

Certification:
- NATIONAL LEAD LABORATORY ACCREDITATION PROGRAM (NLLAP)
- AIHA-LAP, LLC No. 100188
- NYSDOH-ELAP No. 11021

Lead in Soil results are based upon dry sample weights. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.

Method Detection Limit (MDL) per EPA Method 40 CFR Part 136 Appendix B. Reporting Limit (RL) based upon Lowest Standard Determined (LSD) in accordance with AIHA-ELLAP policies.

\[
\text{LSD} = 0.2 \text{ ppm} \quad \text{MDL} = 4.7 \text{ mg/Kg} \quad \text{RL} = 10 \text{ mg/Kg} \quad \text{(based upon 1000 mg sampled). mg/Kg=ppm.}
\]

Sample results are not corrected for contamination by field or analytical blanks.

Disclaimers / Qualifiers:

* Note: The Duplicate QC associated with this batch of samples fell outside of iATL’s acceptable range. (ref. -AIHA Policy Module Sec. 2.C.5.9) . Despite efforts to homogenize soil samples their consistency may vary greatly. Additional QC type samples have also been analyzed with this batch to assure the quality of your results. Contact the Laboratory Director for further explanation.
# Chain of Custody

## Environmental Lead

### Contact Information

<table>
<thead>
<tr>
<th>Client Company</th>
<th>Terracon Consultants, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Number</td>
<td>N1187120</td>
</tr>
<tr>
<td>Project Name</td>
<td>Paul Dunbar House</td>
</tr>
<tr>
<td>Office Address</td>
<td>611 Lunken Park Drive</td>
</tr>
<tr>
<td>City, State, Zip</td>
<td>Cincinnati, OH 45226</td>
</tr>
<tr>
<td>Fax Number</td>
<td>513 321-0294</td>
</tr>
<tr>
<td>Email Address</td>
<td><a href="mailto:Joshua.Vogel@terracon.com">Joshua.Vogel@terracon.com</a></td>
</tr>
<tr>
<td>Primary Contact</td>
<td>Josh Vogel</td>
</tr>
<tr>
<td>Office Phone</td>
<td>513-612-9002</td>
</tr>
<tr>
<td>Cell Phone</td>
<td>859-512-7475</td>
</tr>
</tbody>
</table>

iATL is accredited by the National Lead Laboratory Accreditation Program (NLLAP) to perform analytical testing of environmental samples for lead (Pb). The accreditation is through AIHA-LAP, LLC and several other nationally recognized state programs.

### Matrix/Method:

- [ ] Paint by AAS: ASTM D3335-85a, 2009
- [ ] Air by AAS: NIOSH 7082, 1994
- [ ] Soil by AAS: EPA SW 846 (Soil)
- [ ] Other Metals (Cd, Zn, Cr) by AAS
- [ ] Toxicity Characteristic Leaching Procedure (TCLP) by AAS: USEPA 1311
- [ ] Other

### Special Instructions:

________________________________________________________________________

### Turnaround Time

Preliminary Results Requested Date: ________________________________

- [ ] Verbal
- [ ] Email
- [ ] Fax

- [ ] 10 Day
- [ ] 5 Day
- [ ] 3 Day
- [ ] 2 Day
- [ ] 1 Day*
- [ ] 12 Hour**
- [ ] 6 Hour**
- [ ] RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

### Chain of Custody

- Relinquished (Name/Organization): [Signature]
- Received (Name / iATL): [Signature]
- Sample Login (Name / iATL): [Signature]
- Analysis(Name(s) / iATL): [Signature]
- QA/QC Review (Name / iATL): [Signature]
- Archived / Released: QA/QC InterLAB Use:

Date: 08/06/19

Time: ____________________

Date: ____________________

Time: ____________________

Date: ____________________

Time: ____________________

Date: ____________________

Time: AUG 7-2019

Date: ____________________

Time: ____________________

Date: ____________________

Time: ____________________

Celebrating 25 years...one sample at a time

www.iatl.com
Sample Log

- Environmental Lead -

Client: Terracon Consultants  
Project: N1187120

Sampling Date/Time: 09/06/19

<table>
<thead>
<tr>
<th>Client Sample #</th>
<th>iATL #</th>
<th>Location/Description</th>
<th>Flow Rate</th>
<th>Start</th>
<th>End</th>
<th>Sampling time (min)</th>
<th>Area (ft²)</th>
<th>Volume (L)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>PbS-O1</td>
<td>6576369</td>
<td>House</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PbS-O2</td>
<td>6576370</td>
<td>Barn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* = Insufficient Sample Provided to Perform QC Reanalysis (<200mg)
** = Insufficient Sample Provided to Analyze (<50mg) ***= Matrix/Substrate Interference Possible
FB = Method Requires the submittal of blank(s). ML = Multi-Layered Sample. May result in inconsistent results.

These preliminary results are issued by iATL to expedite procedures by clients based upon the above data. iATL assumes that all of the sampling methods and data upon which these results are based, has been accurately supplied by the client. These results may not have been reviewed by the Laboratory Director. Final Certificate of Analysis will follow these preliminary results. The signed COA is to be considered the official results. All EPA, HUD, and NJDEP conditions apply.

Celebrating 25 years...one sample at a time
www.iatl.com
<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Client No.</th>
<th>Description</th>
<th>Location</th>
<th>Result (% by Weight)</th>
<th>Result (ppm)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6576357</td>
<td>L1</td>
<td>White Paint; Brick</td>
<td>Southwest Corner Of Laundry-Wall</td>
<td>&lt;0.0056</td>
<td>&lt;56</td>
<td>***</td>
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<tr>
<td>6576358</td>
<td>L2</td>
<td>White Paint; Wood</td>
<td>North Side Of Coal Room Door-Wall/Door</td>
<td>&lt;0.0076</td>
<td>&lt;76</td>
<td>***</td>
</tr>
<tr>
<td>6576359</td>
<td>L3</td>
<td>White Paint; Concrete</td>
<td>North Side Of Laundry Room-Wall</td>
<td>0.012</td>
<td>120</td>
<td>***</td>
</tr>
<tr>
<td>6576360</td>
<td>L4</td>
<td>Brown Paint; Wood</td>
<td>Top Step Of Attic-Stairs</td>
<td>8.4</td>
<td>84000</td>
<td>***</td>
</tr>
<tr>
<td>6576361</td>
<td>L5</td>
<td>Black Paint; Wood</td>
<td>West Of Top Step Of Attic-Wall</td>
<td>0.93</td>
<td>9300</td>
<td>***</td>
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<tr>
<td>6576362</td>
<td>L6</td>
<td>Green Paint; Wood</td>
<td>At Entrance Of Kitchen-Door Frame</td>
<td>0.24</td>
<td>2400</td>
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<tr>
<td>6576363</td>
<td>L7</td>
<td>Green Paint; Wood</td>
<td>Back Door Inside The House-Door</td>
<td>0.089</td>
<td>890</td>
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<tr>
<td>6576364</td>
<td>L8</td>
<td>Green Paint; Wood</td>
<td>Back Door Outside The House-Door</td>
<td>0.080</td>
<td>800</td>
<td>****</td>
</tr>
</tbody>
</table>

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 8/7/2018
Date Analyzed: 08/14/2018
Signature: Chad Shaffer

Approved By: Frank E. Ehrenfeld, III
Laboratory Director

Date: 8/14/2018 3:22:11
<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Description</th>
<th>Result (% by Weight)</th>
<th>Result (ppm)</th>
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</thead>
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<tr>
<td>6576365</td>
<td>Tan Paint; Wood</td>
<td>3.9</td>
<td>39000</td>
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<tr>
<td>L09</td>
<td>Above Entry On Door Frame Of Barn</td>
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<td></td>
<td>Bedroom-Door Frame</td>
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<td>6576366</td>
<td>Tan Paint; Wood</td>
<td>11</td>
<td>110000</td>
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<tr>
<td>L10</td>
<td>South Side Of Barn On Top Of Eve-Barn Siding</td>
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<td>6576367</td>
<td>White Paint; Metal</td>
<td>0.41</td>
<td>4100</td>
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<tr>
<td>L11</td>
<td>Sewage Vent Pipe In Basement Stairwell Room-Pipe</td>
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<td>L12</td>
<td>Dining Room Window On Exterior Of House-Window</td>
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</tbody>
</table>

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 8/7/2018
Date Analyzed: 08/14/2018

Signature: Chad Shaffer
Analyst: Chad Shaffer

Dated: 8/14/2018 3:22:11
Appendix to Analytical Report:

Method: ASTM D3335-85a, US EPA SW846 3050B:7000B

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager: cdavis@iatl.com
iATL Account Representative: Cassie Doherty
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Paint
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

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This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:
Analysis by ASTM D3335-85a by AAS

Certification:
- National Lead Laboratory Program (NLLAP): AIHA-LAP, LLC No. 100188
- NYSDOH-ELAP No. 11021

Regulatory limit is 0.5% lead by weight (EPA/HUD guidelines). Recommend multiple sampling for all samples less than regulatory limit for confirmation. All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.

Method Detection Limit (MDL) per EPA Method 40CFR Part 136 Apendix B. Reporting Limit (RL) based upon Lowest Standard Determined (LSD) in accordance with AIHA-ELLAP policies.
LSD=0.2 ppm MDL=0.005% by weight. RL= 0.010% by weight (based upon 100 mg sampled).

Disclaimers / Qualifiers:
There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a complete list with highlighted disclaimers pertinent to this project. For a full explanation of these and other disclaimers, please inquire at customerservice@iatl.com.

* Insufficient sample provided to perform QC reanalysis (<200 mg)
** Not enough sample provided to analyze (<50 mg)
*** Matrix / substrate interference possible.
Chain of Custody

Environmental Lead

Contact Information

Client Company: Terracon Consultants, Inc.  
Project Number: N1187120

Office Address: 611 Lunken Park Drive  
Project Name: Paul Dunbar House

City, State, Zip: Cincinnati, OH 45226  
Primary Contact: Josh Vogel

Fax Number: 513 321-0294  
Office Phone: 513-612-9002

Email Address: Joshua.Vogel@terracon.com  
Cell Phone: 859-512-7475

iATL is accredited by the National Lead Laboratory Accreditation Program (NLLAP) to perform analytical testing of environmental samples for lead (Pb). The accreditation is through AIHA-LAP, LLC and several other nationally recognized state programs.

Matrix/Method:

☑️ Paint by AAS: ASTM D3335-85a, 2009
☐ Wipe/Dust by AAS: SW 846: 3050B: 700B, 2010
☐ Air by AAS: NIOSH 7082, 1994
☐ Soil by AAS: EPA SW 846 (Soil)
☐ Water by AAS-GF: ASTM D3559-03D, USEPA 40CFR 141.11B, 2010
☐ Other Metals (Cd, Zn, Cr) by AAS
☐ Toxicity Characteristic Leaching Procedure (TCLP) by AAS: USEPA 1311
☐ Other ____________________

Special Instructions:

_________________________________________________________________________

_________________________________________________________________________

Turnaround Time

Preliminary Results Requested Date: ________________________________

☐ Verbal  ☐ Email  ☐ Fax

☐ 10 Day  ☑ 5 Day  ☐ 3 Day  ☐ 2 Day  ☐ 1 Day*  ☐ 12 Hour**  ☐ 6 Hour**  ☐ RUSH**

* End of next business day unless otherwise specified.  ** Matrix Dependent. *** Please notify the lab before shipping***

Chain of Custody

Relinquished (Name/Organization): ________________________________  Date: 09/06/19  Time:

Received (Name / iATL): ________________________________  Date: 09/06/19  Time:

Sample Login (Name / iATL): ________________________________  Date: 09/06/19  Time:

Analysis(Name(s) / iATL): ________________________________  Date: 09/06/19  Time:

QA/QC Review (Name / iATL): ________________________________  Date: 09/06/19  Time:

Archived / Released: Q/A/QC InterLAB Use: ________________________________  Date: 09/06/19  Time:
<table>
<thead>
<tr>
<th>Lab Sample #</th>
<th>Terracon Sample #</th>
<th>Component</th>
<th>Paint Color (surface)</th>
<th>Substrate</th>
<th>Sample Location</th>
<th>Comments / Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td></td>
<td>Wall</td>
<td>White</td>
<td>Brick</td>
<td>Southeast Corner of Laundry</td>
<td>6576357</td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td>Wall/Door</td>
<td>White</td>
<td>Wood</td>
<td>Northside of Coal Room Door</td>
<td>6576353</td>
</tr>
<tr>
<td>L3</td>
<td></td>
<td>Wall</td>
<td>White</td>
<td>Concrete</td>
<td>North Side of Laundry Room</td>
<td>6576359</td>
</tr>
<tr>
<td>L4</td>
<td></td>
<td>Stairs</td>
<td>Brown</td>
<td>Wood</td>
<td>Top Step of Attic</td>
<td>6576389</td>
</tr>
<tr>
<td>L5</td>
<td></td>
<td>Wall</td>
<td>Black</td>
<td>Wood</td>
<td>West of Top Step of Attic</td>
<td>6576381</td>
</tr>
<tr>
<td>L6</td>
<td></td>
<td>Door Frame</td>
<td>Green</td>
<td>Wood</td>
<td>At Entrance of Kitchen</td>
<td>6576382</td>
</tr>
<tr>
<td>L7</td>
<td></td>
<td>Door</td>
<td>Green</td>
<td>Wood</td>
<td>Back Door inside the House</td>
<td>6576383</td>
</tr>
<tr>
<td>L8</td>
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<td>Door</td>
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<td>Back Door outside the House</td>
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<tr>
<td>L9</td>
<td></td>
<td>Door Frame</td>
<td>Tan</td>
<td>Wood</td>
<td>Above Entry on Door Frame of Barn Bedroom</td>
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<tr>
<td>L10</td>
<td></td>
<td>Barn Siding</td>
<td>Tan</td>
<td>Wood</td>
<td>South Side of Barn on top of Eve</td>
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<tr>
<td>L11</td>
<td></td>
<td>Pipe</td>
<td>White</td>
<td>Metal</td>
<td>Sewage Vent Pipe in Basement Stairway Room</td>
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<tr>
<td>L12</td>
<td></td>
<td>Window</td>
<td>Green</td>
<td>Wood</td>
<td>Dining Room Window on Exterior of House</td>
<td>6576368</td>
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# DAILY QUALITY CONTROL DATA

## LEAD SAMPLE ANALYSIS

(DATE: 08 / 14 / 18)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Total Lead (mg)</th>
<th>Percent Recovery **</th>
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<td>Blank Spike</td>
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<td>Lab Control Std</td>
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<td>Matrix Spike - LBP *</td>
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<td>Matrix Spike - Wipe *</td>
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<td>Matrix Spike - Soil *</td>
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<td>Matrix spike - Air *</td>
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<td>2.5 ppm Standard</td>
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<td>40.0 ppm Standard</td>
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**AIHA-LAP, LLC No. 100188**

**NYSDOH-ELAP No. 11021**

**Analysis Method:**
- ASTM D3335-85A
- NIOSH 7082
- EPA SW846 3050B 7000B

**Comments:**
- IATL assumes that all sampling complies with accepted methods.
- All client supplied sampling data is assumed to be correct when calculating results.
- Detection limit based upon 0.2 mg/L reporting limit and sample size.
- * NIST Traceable.
- ** 80-120% acceptable limits.

**Analyzed By:**

R. Chad Shaffer

**Date:**

**Approved By:**

Frank E. Ehrenfeld, III

Laboratory Director

AAS DailyQC.005
## Cultural Landscape and Historic Structures Report - Paul Laurence Dunbar House
### Dayton Aviation Heritage National Historical Park
#### STRATA Architecture Inc
#### Final Estimate 09/12/2019

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>Immediate</th>
<th>Long Term</th>
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<tr>
<td>Dunbar House</td>
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<td>Barn</td>
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<tr>
<td>Landscape</td>
<td>-</td>
<td>93,195</td>
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</tbody>
</table>

*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 - Paul Laurence Dunbar House

**Dayton Aviation Heritage National Historical Park**

**STRATA Architecture Inc**

**Final Estimate 09/12/2019**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>Immediate</th>
<th>Long Term</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dunbar House</strong></td>
<td></td>
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<tr>
<td>01 00 00 GENERAL CONDITIONS (assume stand alone project)</td>
<td>1,460</td>
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<td>02 41 00 DEMOLITION</td>
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<tr>
<td>02 50 00 HAZARDOUS MATERIAL ABATEMENT</td>
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<tr>
<td>03 30 00 CAST-IN-PLACE CONCRETE</td>
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<td>105,011</td>
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<tr>
<td>04 01 20 MASONRY RESTORATION AND CLEANING</td>
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<tr>
<td>05 12 00 STEEL</td>
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<td>13,000</td>
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<tr>
<td>06 13 00 ROUGH CARPENTRY</td>
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<tr>
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<td>07 30 00 INSULATION</td>
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<tr>
<td>07 50 00 ROOFING</td>
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<tr>
<td>08 10 00 WINDOWS</td>
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<tr>
<td>08 11 00 DOOR &amp; FRAMES</td>
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<tr>
<td>09 20 00 GYPSUM</td>
<td>4,000</td>
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<tr>
<td>09 50 00 CARPET</td>
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<td>09 90 00 PAINTING</td>
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<td>10 28 00 TOILET AND BATH ACCESSORIES</td>
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<td>22 00 00 PLUMBING</td>
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<td>23 00 00 HVAC</td>
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<td>26 00 00 ELECTRICAL</td>
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<tr>
<td>33 10 00 WATER DISTRIBUTION</td>
<td>11,196</td>
<td>496,422</td>
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</table>

*NOTE: Costs do not include archeological monitoring*

*NOTE: Costs do not include additional design or engineering fees*
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### Dunbar House

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT $</th>
<th>Immediate</th>
<th>Long Term</th>
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<tbody>
<tr>
<td><strong>02 41 00 DEMOLITION</strong></td>
<td></td>
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<tr>
<td>General Cleaning</td>
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<td>2.093 SF</td>
<td>2.00</td>
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<tr>
<td>Strip/clean graffiti paint from front porch north wall</td>
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<td>1 LS</td>
<td>600.00</td>
<td>600</td>
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<td>Salvage Window 003</td>
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<td>1 LS</td>
<td>250.00</td>
<td>250</td>
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<tr>
<td>Selective Demolition, Exploration and cleaning of Crawl Space ALLOW</td>
<td>i</td>
<td>1 LS</td>
<td>5,000.00</td>
<td>5,000</td>
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<tr>
<td>Closet 102 Remove Carpet and inspect floor, Remove non-historic Wallpaper</td>
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<td>1 LS</td>
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<td><strong>02 50 00 HAZARDOUS MATERIAL ABATEMENT</strong></td>
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<td>Lead Based Paint Monitoring ALLOW</td>
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<tr>
<td>Long Term Abate Asbestos Interior</td>
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<tr>
<td>Clean Mildew on back Porch Ceiling</td>
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<td>1 LS</td>
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<td>Clean and Treat Mildew in attic</td>
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<td>6,000.00</td>
<td>6,000</td>
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<tr>
<td>Clean and Treat Mildew in basement</td>
<td>i</td>
<td>1 LS</td>
<td>5,000.00</td>
<td>5,000</td>
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<td><strong>03 30 00 CAST-IN-PLACE CONCRETE</strong></td>
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<tr>
<td>Concrete Footing for Posts</td>
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<tr>
<td>Rebuild Window Wells (005 and 006) and Install Drain to daylight</td>
<td>2 EA</td>
<td>4,500.00</td>
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<td><strong>04 01 20 MASONRY RESTORATION AND CLEANING</strong></td>
<td></td>
<td></td>
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<tr>
<td>Repair NE Corner Stone Foundation</td>
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<td>1 LS</td>
<td>400.00</td>
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<tr>
<td>Underpin Front Porch South Stone Edging ALLOW</td>
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<td>Repoint 80% Exterior</td>
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<td>Clean Exterior</td>
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<td>Replace Bricks</td>
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<td>Helical Anchors</td>
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<td>Chimney Maintenance and repairs</td>
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<td>Spot Repointing on Stone Foundation Walls</td>
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<tr>
<td>Spot Repointing on Interior Brick Basement Walls and Misc Brick Replacement</td>
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<td>1 LS</td>
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<td>3,000</td>
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<tr>
<td>Spot Repointing on the Enclosed Porch east wall and replace brick</td>
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<tr>
<td>Repoint Interior of west Gable Wall and replace bricks</td>
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<td>1 LS</td>
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<td>5,000</td>
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<tr>
<td>Infill Round Duct with brick</td>
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<tr>
<td>Rebuild Brick under 002</td>
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<td>1 LS</td>
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<td>Infill oversized openings in basement</td>
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<td>Provide Enlarged crawl space access</td>
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<tr>
<td>Restore Tile Hearths in Front Parlor and Reception Hall</td>
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<td>Restore Plaque</td>
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<td>Repair/replace the stone lintel at the east elevation basement windows</td>
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<td>Mortar Tests</td>
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<td>Lift Rental</td>
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<td><strong>05 12 00 STEEL</strong></td>
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<td>Install W8 Steel Beams</td>
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<td>Install Steel Posts</td>
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<td>New Metal Stair/Ladder</td>
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<tr>
<td>Handrail on Front Steps</td>
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<td>New Steel Handrail and Hinges at attic access door</td>
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<td><strong>06 13 00 ROUGH CARPENTRY</strong></td>
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<tr>
<td>Double 2x6 Ledger @ N &amp; S Walls</td>
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<td>Int Wood Framed Walls in Basement</td>
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<td>Sister Joists @ 1st Floor 003</td>
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<td>Sister Joists @ 1st Floor 004</td>
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<td>Sister Attic Rafters</td>
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<td>New Wood Ramp at Front Porch</td>
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<tr>
<td>Wood rot Repair Allowance</td>
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Total: 4,186 6,700 30,300 105,011 13,000 29,226
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT $</th>
<th>Immediate</th>
<th>Long Term</th>
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<tbody>
<tr>
<td>Dunbar House</td>
<td></td>
<td></td>
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<tr>
<td><strong>06 40 16 INTERIOR ARCHITECTURAL WOODWORK</strong></td>
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<td>Repair Gas Heater Grille at Fireplace in Reception Hall</td>
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<td>Install wood Wall Rail @ Stairs</td>
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<tr>
<td>Misc Millwork repair at 2nd floor</td>
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<tr>
<td><strong>07 30 00 INSULATION</strong></td>
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<td>Insulate Attic</td>
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<td><strong>07 40 00 WATERPROOFING</strong></td>
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<td>Water Proof at penetrations in basement</td>
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<tr>
<td>Roof Maintenance Repair</td>
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<tr>
<td><strong>08 10 00 WINDOWS</strong></td>
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<td>800</td>
<td>4,350</td>
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<tr>
<td>Restoration of Basement Windows</td>
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<tr>
<td>Screened Louver for Basement Crawl Space Access</td>
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<td>400.00</td>
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<td>Repair back porch windows</td>
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<tr>
<td>Repair Attic Windows</td>
<td>3 EA</td>
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<td>1,800</td>
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<tr>
<td>Window Restoration (1st and 2nd)</td>
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<td>New Storm Windows Basement and Attic</td>
<td>9 EA</td>
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<tr>
<td>New Storm Windows</td>
<td>15 EA</td>
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<td>16,500</td>
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<tr>
<td><strong>08 11 00 DOOR &amp; FRAMES</strong></td>
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<tr>
<td>Demo Door 1-107 and widen Opening</td>
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<tr>
<td>Install new reproduction Door/Frame/Hardware 1-107</td>
<td>1 EA</td>
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<td>2,500</td>
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<tr>
<td>Repair Pocket Doors and Stabilize the Wall</td>
<td>1 EA</td>
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<tr>
<td>Historic Door Bell 1-101</td>
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</tr>
<tr>
<td>Refresh Interior Wood Doors 1-100, 1-101</td>
<td>2 EA</td>
<td>500.00</td>
<td>1,000</td>
<td></td>
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<td>TOTAL</td>
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*NOTE: Costs do not include archeological monitoring*

*NOTE: Costs do not include additional design or engineering fees*
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### Barn

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Cultural Landscape and Historic Structures Report - Paul Laurence Dunbar House
Dayton Aviation Heritage National Historical Park
STRATA Architecture Inc
Final Estimate 09/12/2019

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subtotal: - 85,137
Contractor's Fee 10%: - 8,514
subtotal: - 93,651
Design/Estimate Contingency 20%: - 18,730
subtotal: - 112,381
Escalation to Mid-Point - 08/31/2021 6.0%: - 6,744
TOTAL: - 119,125

Option - Add for New Lift in New Exterior Vestibule: 23,760
Option - Add for New Lift inside and New Exterior Vestibule: 27,870

*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 - Paul Laurence Dunbar House

## Dayton Aviation Heritage National Historical Park

**Final Report 09/12/19**

## Visitor Center Accessibility Renovations

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**Option - Add for New Lift in New Exterior Vestibule**

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**Option - Add for New Lift inside and New Exterior Vestibule**

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### Cultural Landscape and Historic Structures Report - Paul Laurence Dunbar House
### Dayton Aviation Heritage National Historical Park
### STRATA Architecture Inc
### Final Estimate 09/12/2019

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*NOTE: Costs do not include archeological monitoring*

*NOTE: Costs do not include additional design or engineering fees*
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### Landscape

#### 32 93 00. EXTERIOR PLANTS

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<tr>
<td>Plant flowering crabapple with a multi-stem, rounded form</td>
<td>1 EA</td>
<td>350.00</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>Plant turf</td>
<td>30 SF</td>
<td>15.00</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>V3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Remove three eastern red-cedar trees from south slope</td>
<td>3 EA</td>
<td>250.00</td>
<td>750</td>
<td></td>
</tr>
<tr>
<td>b. Plant river birch</td>
<td>1 EA</td>
<td>500.00</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>c. Plant five deciduous trees</td>
<td>5 EA</td>
<td>500.00</td>
<td>2,500</td>
<td></td>
</tr>
<tr>
<td>d. Plant four deciduous shrubs</td>
<td>4 EA</td>
<td>65.00</td>
<td>260</td>
<td></td>
</tr>
<tr>
<td>e. Remove non-contributing bed near path. Replace with turf</td>
<td>27 SF</td>
<td>10.00</td>
<td>270</td>
<td></td>
</tr>
<tr>
<td>f. Remove non-contributing trumpet creeper. Replace with lily-of-the-valley</td>
<td>10 SF</td>
<td>50.00</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>V4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Remove English ivy 50SF</td>
<td>1 LS</td>
<td>800.00</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>Circulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Repair stone walkway lift flagstone pavers and stone step and reset on new base</td>
<td>50 SF</td>
<td>17.50</td>
<td>875</td>
<td></td>
</tr>
<tr>
<td>C2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Remove concrete entry walk west of sidewalk, front steps, railings, and upper landing near porch</td>
<td>153 SF</td>
<td>8.00</td>
<td>1,224</td>
<td></td>
</tr>
<tr>
<td>b. Replace in-kind four limestone steps (6’-6”x12”x9”) at entry walk</td>
<td>4 EA</td>
<td>300.00</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>c. Rehabilitate walk and landing in historic form with light aggregate concrete</td>
<td>153 SF</td>
<td>15.00</td>
<td>2,250</td>
<td></td>
</tr>
<tr>
<td>d. Railings</td>
<td>2 EA</td>
<td>350.00</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>C3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Add one barrier-free parking space</td>
<td>30 LF</td>
<td>15.00</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>b. Add one bus parking barrier-free parking space</td>
<td>1 EA</td>
<td>150.00</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>C4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Remove existing concrete</td>
<td>100 SF</td>
<td>15.00</td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>b. New Concrete Walk</td>
<td>42 SF</td>
<td>15.00</td>
<td>630</td>
<td></td>
</tr>
<tr>
<td>c. Remove existing concrete</td>
<td>210 SF</td>
<td>5.00</td>
<td>1,050</td>
<td></td>
</tr>
<tr>
<td>d. New Concrete Walk</td>
<td>210 SF</td>
<td>15.00</td>
<td>3,150</td>
<td></td>
</tr>
<tr>
<td>C5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Construct 3’ wide sloped path with dark colored aggregate concrete to access barn</td>
<td>97 SF</td>
<td>18.00</td>
<td>1,746</td>
<td></td>
</tr>
<tr>
<td>C6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Replace concrete walk</td>
<td>240 SF</td>
<td>20.00</td>
<td>4,800</td>
<td></td>
</tr>
<tr>
<td>b. Add 5’ walk with dark aggregate concrete</td>
<td>43 SF</td>
<td>18.00</td>
<td>774</td>
<td></td>
</tr>
<tr>
<td>c. Repair asphalt entry to barn from alley</td>
<td>8 SY</td>
<td>45.00</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Buildings and Structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.1. Preserve historic, small-scale features</td>
<td>1 LS</td>
<td>1,000.00</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>a. Protect, repair, and maintain cast iron fence</td>
<td>1 LS</td>
<td>200.00</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>F.3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Add 7’ high wooden picket fence</td>
<td>12 LF</td>
<td>70.00</td>
<td>840</td>
<td></td>
</tr>
<tr>
<td>F.5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Remove sign and install new sign with lighting ALLOW</td>
<td>1 LS</td>
<td>7,500.00</td>
<td>7,500</td>
<td></td>
</tr>
<tr>
<td>b. Relocate sign</td>
<td>1 EA</td>
<td>600.00</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>c. Relocate sign</td>
<td>1 EA</td>
<td>750.00</td>
<td>750</td>
<td></td>
</tr>
<tr>
<td>d. Relocate sign</td>
<td>1 LS</td>
<td>300.00</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>