Madame John's Legacy

New Orleans, Louisiana

Technical Conservation Study



Photograph from George F. Mugnier Collection, courtesy Louisiana State Museum & New Orleans Public Library

Master of Preservation Studies Program
Tulane University
School of Architecture

August 2013

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Technical Conservation Study

New Orleans, Louisiana

Prepared For

Louisiana Division of Historic Preservation
Office of Cultural Development
Department of Culture, Recreation and Tourism
Baton Rouge, Louisiana

Louisiana State Museum
New Orleans, Louisiana

Prepared By

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"I observed... that salt exuded from the soil to such an extent
as to even injure the pyramids.

— Herodotus (484 B.C.), *The Histories, Book 2*

1.0 INTRODUCTION

One of Louisiana's most distinguished historic buildings, Madame John's Legacy, a raised urban dwelling with its earliest architectural elements dating to the 1700s, is a key property under the curatorial management of the Louisiana State Museum. Located at 632 Dumaine Street in the Vieux Carré, Madame John's Legacy was extensively restored in the 1940s by the noted restoration firm of Koch and Wilson Architects to be a house museum, and again in the 1970s and 1990s. It is currently used for exhibitions and modestly sized special events.

Though the building has been the subject of numerous repair campaigns and restoration efforts over the past seventy-five years, issues related to its physical condition and long-term preservation still persist. Most notably, the deteriorated state of the building's ground floor brick masonry has been an apparent problem since the beginning of the twentieth century, when interior photographs show brick in very poor condition in these interior spaces. Although often the subject of repair efforts, the condition of the ground floor masonry has not been entirely improved by these interventions. In fact, it is more likely that the opposite has occurred and that these previous interventions have exacerbated the masonry deterioration.

Because of the need for a better, more comprehensive understanding of the condition of this important building, in 2012 the Tulane University School of Architecture Master of Preservation Studies Program successfully applied for funding to study the various architectural conservation issues at hand. The result is the current Technical Conservation Study, which was performed from December 2012 through August 2013.

This study seeks to document and assess the current condition of the ground floor masonry of Madame John's Legacy, with the goal being to develop a better understanding of the extent of the deterioration and its possible causes. It uses a wide range of technical and investigative tools, some state of the art, to examine the masonry's condition and to attempt to identify the sources of observed conditions. The following report summarizes the various methods used to document, investigate and evaluate the masonry conditions and deterioration mechanisms. It also draws conclusions and makes recommendations for both short-term and long-term remedial actions.

While the focus of this technical conservation study was on the brick masonry of the ground floor level, it also involved three other substantial undertakings. One is the compilation of all archival materials (historic photographs, architectural drawings, correspondence, etc..) related to Madame John's Legacy, and in particular the ground floor masonry. The second is a review of a previously-performed exterior paint analysis, completed in the 1980s. The current paint study revisits these earlier findings, which form the basis for Madame John's Legacy's current paint scheme, and draws some revised conclusions. And thirdly, the archaeological investigation of select sub-surface areas of the interior ground floor. While this work was performed mainly to provide information on the

floor construction and condition of the lower portions of the brick walls, it also yielded a good deal of archaeological data.

The following report is organized into four principal sections: introduction and background information; a summary of the study's methodology; a summary of the study's findings; and finally, conclusions and recommendations. Each section includes detailed information related to the study's primary areas of focus: archival research; the field investigation (condition survey, moisture survey and investigative probes, and archaeology); environmental monitoring; and laboratory analysis. The report is also supplemented with several appendices, including primary archival documents as well as reports prepared by sub-consultants as part of the current study.

It is the hope of the report's authors that this report provides not only comprehensive documentation of one of New Orleans' most important buildings, but also a useful tool for its long-term preservation. The information included in this report is intended to be used as a guide by the Louisiana State Museum, to inform future decisions and planning efforts related to the preservation and material conservation of Madame John's Legacy.

2.0 BACKGROUND INFORMATION

On Dumaine Street, between Royal and Chartres Streets in the French Quarter of New Orleans, stands a large house that looks slightly out of place with its neighbors. The immediate neighborhood, and indeed the French Quarter itself, is largely made up of tidy one-story Creole cottages and shotgun houses, two- and three-story brick townhouses and the occasional warehouse building, many dating from the early to mid 19th century. This particular building on Dumaine Street, however, appears to come from a much earlier time. It features a raised brick basement flush with the sidewalk, a framed second story with a deep and gracious front porch running lengthwise with the street, and a massive hipped roof punctuated by two small dormers. It recalls more the 18th century French-Creole plantations that dot the rural levees of the Mississippi River outside of town than it does any urban dwelling of the city's core, in which it resides (*Figure 1*).

This peculiar appearance in relation to its surroundings has long been the source of fascination with the building's history and origins. Many artistic renderings exist from the late 19th and early 20th centuries that depict the old house in a romantic and fanciful light (*Figure 2*). Stories, perhaps embellished, have circulated depicting the basement as a one-time den of pirates and rogues.[1] Even the name by which the house is popularly known, "Madame John's Legacy," comes not from a past owner but from an 1879 short story by George Washington Cable emphasizing the romantic notion of the "old Creole days" (incidentally the exact title of the collection in which the story first appeared). It would not be inaccurate to say that for much of its history, and for many people still, this imposing structure on Dumaine Street lived more in the imagination than in fact.

As is often the case, however, the true history of the building known as Madame John's Legacy has proven to be much more interesting than any of its fictitious depictions. It is one of the oldest remaining buildings in New Orleans, and it is one of the few remaining structures from the city's colonial period, which lasted from its founding under the French in 1718, to its transfer to the Spanish in 1763, and to its acquisition by the United States in 1803.[2] Of those pre-1803 buildings that remain, Madame John's is one of even fewer that is recognizably French in its construction and design, as opposed to the Spanish architecture which proliferates in the old French Quarter (a misnomer in the architectural sense).[3]

The significance of Madame John's Legacy stems largely from its age and style. The French Quarter suffered massive conflagrations in 1788 and 1794, both of which destroyed large portions of the city's existing building stock. Widespread rebuilding naturally followed in the designs and style of

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[1] Ray Samuel, "Dwelling on Dumaine," *Times Picayune-New Orleans States Magazine* (July 17, 1949), 1-3.
[2] Joan B. Garvey and Mary Lou Widmer, *Beautiful Crescent: A History of New Orleans* (Covington: Garmer Press, 1982), 23, 42, 59.
[3] Eugene D. Cizek, "Beginnings: Creole Architecture for the Louisiana Setting" in *Louisiana Buildings, 1720–1940: The Historic American Buildings Survey* (Baton Rouge: Louisiana State University Press, 1997), 32.

the day: late 18th century colonial Spanish, or "second-generation Creole."[4] The few French Colonial structures that did survive the fires eventually succumbed to the forces of time and progress, gradually disappearing from the landscape. Thus the oldest buildings in the city today only date as far back as the 1780s and '90s, and they are quite rare (with the notable exception of the old Ursulines Convent on Chartres Street, which dates to 1745-53).[5] What the modern-day visitor sees in the French Quarter is a cityscape echoing the late Spanish and early American periods, largely created between 1790 and 1840.[6] The style of the nation for which the neighborhood is named (and city founded) hardly exists today at all, and a representative example cannot be found in the old quarter, except for at Madame John's Legacy.[7]

However, the complex of buildings that stand at 632 Dumaine Street do not actually date from the French period. Though the main house appears to be an artifact from the 1740s or 50s, in fact it dates to the late 1780s. The circumstances under which this confusion arose can be traced back to the fire of 1788. To be sure, a house of some sort had sat on the property since 1721 when it was initially granted to Jean Pascal, a French ship captain.[8] Early maps show that these initial structures were small and rudimentary. Ten years later, however, a house on that lot appears to be much larger in size and vaguely similar to the present-day footprint. *(Figure 3*) That building appears to have survived through the relatively languid French and Spanish colonial periods until 1788, when a tumultuous fire that swept through the town reached its doorstep. The owner of the house at that time, Manuel DeLanzos, a Spanish naval officer, apparently chose to rebuild his burned dwelling in much the same manner it was before.[9] This is likely because the house was not completely destroyed. The extent to which the house was damaged is not precisely known, but it is evident that a building contract between DeLanzos and an American builder named Robert Jones, dated just eleven days after the fire, specified for a house to be built on that lot and that DeLanzos would supply brick and ironwork "from his burned houses."[10] That some ironwork and brick remained on site in good enough condition to reuse speaks to the fact that the house must have not burned completely to the ground, but rather suffered in a moderate way so as to require only partial rebuilding. This is why the building cannot date to the French period – the contract clearly specifies the building of a new house – but it can claim direct roots.

Fortunately the property escaped damage altogether from the 1794 fire, and has subsequently survived wars, hurricanes, and termites to stand today on the same ground today over 200 years

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[4] Richard Campanella, *Bienville's Dilemma: A Historical Geography of New Orleans* (Lafayette: UL-L Center for Louisiana Studies, 2008), 304-308.
[5] Campanella, *Bienville's Dilemma*, 140.
[6] Campanella, *Bienville's Dilemma*, 140-143.
[7] Campanella, *Bienville's Dilemma*, 128.
[8] Shannon Lee Dawdy, "Madame John's Legacy (16OR51) Revisited: A Closer Look at the Archaeology of Colonial New Orleans" (New Orleans: UNO College of Urban and Public Affairs, Greater New Orleans Archaeology Program, June 1998), 29.
[9] Cizek, "Beginnings," 32-33.
[10] Dawdy, "Madame John' Legacy," 40-42.

later. A series of owners looked after the house throughout the 19th century, with only one keeping it longer than a generation.[11] In the late 19th and early 20th centuries the building fell into a state of disrepair, and like so many others in its French Quarter neighborhood, was subdivided into tenant apartments primarily for working-class immigrants.[12] Ms. Stella Lemann, a resident of upper St. Charles Avenue, purchased the site in 1925 and operated as its nonresident landlord, renting rooms to many different artists who lived upstairs and sold their work downstairs. She recognized the historical and architectural significance of the house, however, and in 1947 chose to donate it to the Louisiana State Museum on the stipulation that it be kept open to the public.[13]

While the house has indeed been standing for over 230 years, it has, like any continuously inhabited dwelling, undergone various physical changes, renovations, and adaptations through the years. From its construction in 1788 to its donation to the Louisiana State Museum in 1947, many repairs and additions were made – some well documented, others not. Generally, the ground floor basement has received less attention than the second-level main floor, and as a result, it is difficult to piece together a detailed history of changes to the space during its period of private ownership. However, upon transition to public hands in 1947, numerous renovations have occurred at a much higher level of documentation than before. While the ground floor still received comparatively less attention, it is easier to document physical changes from this point on.

In addition to this brief description of background information about the history of Madame John's Legacy, *Section 4.1* of this report summarizes the findings of the archival research performed as part of this project, specifically as it relates to the ground floor masonry, and *Appendix A* contains a compilation of key historic information.

[11] Dawdy, "Madame John' Legacy," 27-28.
[12] Dawdy, "Madame John' Legacy," 49-51.
[13] Dawdy, "Madame John's Legacy," 51; Minutes of Meeting of the Louisiana State Museum Board of Directors, 1947.



Figure 1. Madame John's Legacy, 632 Dumaine Street in 1937. Photograph courtesy of Library of Congress.



Figure 2. Painting by Alberta Kinsey, c. 1935. Photograph courtesy of the Louisiana State Museum.

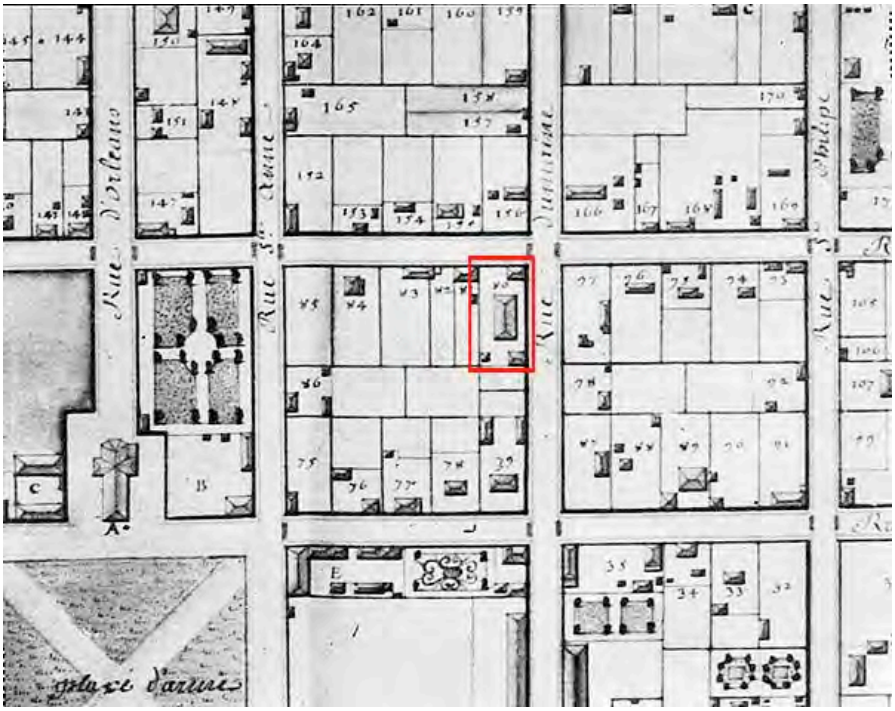


Figure 3. Detail of Gonichon's 1731 map showing the improved structure on Dumaine Street. Image courtesy of the Louisiana State Museum.

3.0 METHODOLOGY

3.1 Archival Research

As with any project of a similar scope, background archival research formed a major component of the Madame John's Legacy Technical Conservation Analysis Project. In order to fully understand the complex issues presented in the structure's basement, it was necessary to understand the history of the space, its construction, and any relevant changes or alterations which had been made during its recorded history.

The first step was to gather all known sources of information together. As the property is owned and operated by the Louisiana State Museum, initial research was done through the Museum's holdings. Their collections facility at 1000 Chartres Street in the French Quarter offered a range of secondary source material, such as copies of architectural drawings, building specifications, historic paintings and drawings, notarial acts, and the like. Of course, these copies only provided an initial base off of which to build further research, but they did aid greatly in pointing the direction in which it should go.

Due to the significance of the Madame John's Legacy site, there already existed a great deal of secondary information written, such as books, newspaper articles, and pamphlets, some of which dated back to the 19th century. There is a long history of fascination with the structure due to its unique appearance and age, and as a result, much of its history has already been recorded and published for quite some time. Because this part of the project was focused exclusively on the history of the ground floor space, only references related to the ground floor were identified. Unfortunately, very few such references existed, as the basement was utilitarian in nature, unfinished, and largely ignored when it came to the historical record. However, a handful of key references were found which did aid in research, such as historic photographs and architectural plans.

Original architectural drawings and buildings specifications were to be found at the Louisiana Historical Center at the Old U.S. Mint. This collection was central throughout the research process. Upon consultation of the relevant finding aids, it was ascertained that the primary sources relating to Madame John's Legacy there were indeed architectural drawings and specs. Numbering about a dozen, these sets proved to be the most invaluable to the research process. Full plans from restoration campaigns in 1972 and 1996 laid the groundwork for understanding basement issues, and partial plans from 1948 and 1982 filled in gaps. These are the four periods in the 20th century that significant repairs were undertaken at Madame John's Legacy. Prior to its acquisition by the State Museum in 1947, there were not significant records of repairs, the only exceptions being brief structural mentions in notarial acts of sale (although the notarial history of the site has been fully

researched for some time, a visit was still paid to the Notarial Archives of the City of New Orleans to confirm the findings).

In addition to the architectural plans at the Historical Center, there was also a vertical file there dedicated to Madame John's Legacy containing historic photographs from HABS documentation in the 1940s, correspondence during restoration campaigning in the 1970s, copies of contracts, and other such ephemera. Likewise, the Historic New Orleans Collection held a number of historic photographs, most of which were also held by the Louisiana State Museum. Various online databases also entered into my research, such as The Collins C. Diboll Vieux Carre Digital Survey (HNOC), the New Orleans Public Library website, and the Southeastern Architectural Archive at Tulane University. In these instances, research methodology usually involved searching for terms or keywords, sifting through the results, and rephrasing the search terms more specifically if needed.

The end goal of the historic and archival research was a synthesis of all relevant information, presented categorically and chronologically, which would then be employed on site as a reference guide. This synthesized information is summarized in *Section 4.1* and is also included in *Appendix A.* The latter contains a "Finding Aid" listing all of the information that can be found at various repositories, as well as electronic versions of historic images found as part of this research.

3.2 Field Investigation

3.2.1 Survey of Condition and Construction Campaigns

A key component of the current study was the implementation of a detailed visual survey of the masonry walls of the ground floor, documenting both key conditions and construction (repair) campaigns. The survey represents the first in-depth look at the ground floor masonry conditions. While generally recognized and in poor condition, a systematic survey of the walls had not been performed to date. Documenting visual conditions is the first step in developing an understanding of any structure's overall integrity and identifying problem areas. It also provides graphic documentation that allows patterns of deterioration and the possible causes of the apparent deterioration to be assessed.

This survey was performed using semi-rectified photographs for the physical recordation of information in the field, information that was later digitized to create electronic versions of the survey record. In order to be consistent with the LSM's records, for the survey, walls were numbered according to a pre-existing system used by the LSM (which included the designation of "04" for the building, "1" for the floor level and then individual room numbers). Each distinct section of wall was assigned an alphanumerical reference that included the building number, floor level and room number, plus the orientation of the wall and then a number indicating the section (in the case of single walls that are broken up into multiple sections). For example, Wall 282-NE-2 is the wall in Room 282 that one faces if looking to the northeast and it is one of two sections of the northeast wall in this room. Because room numbers were also applied to the exterior foyer and gallery spaces, the same numbering system could also be applied to the exterior faces of the walls that were surveyed as part of this study. For the exterior wall that faces the alley on the lake side (northwest) side of the building, however, no room number existed. So, the wall designations for this exterior wall include a reference to the "alley." See *Figure 4* for the ground floor plan of the building with room numbers and wall designations.

Interior and exterior walls of the building were photographed using a Nikon D40 digital SLR camera and a Nikon D90 digital SLR camera. The lighting conditions in the building made photographing the walls in single sections challenging and the resolution of the resulting images was too poor. To rectify this, and in the absence of access to proper studio lighting or light meters, the group improvised and used two portable halogen work lights, a detachable flash, and an attached light reader. The walls were then photographed in sections with chalk X's drawn on the walls as guides to assist in the piecing together of images. The sections were then stitched together in Photoshop using photo-merge, distortion was removed from the images, and all images were scaled (note that the differing lengths of the walls and the inherent limits of page size made scale consistency impractical for this project). The rectified and merged photos were then labeled, printed out, and placed into plastic sleeves to be used in the physical conditions assessment.

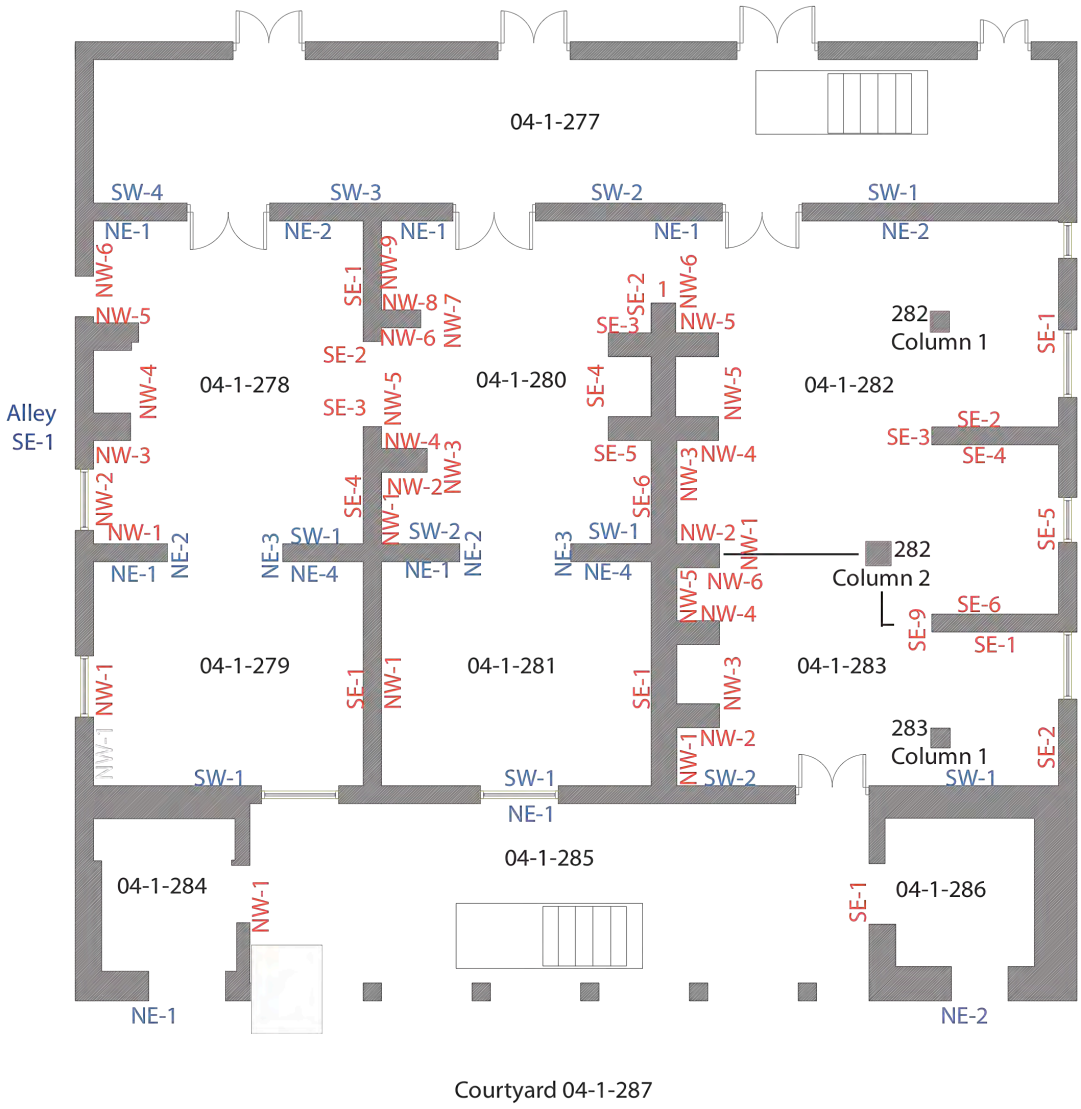


Figure 4. Madame John's Legacy Ground Floor Plan. Room Numbers and Wall Designations for Survey

Each interior wall was visibly observed for the following conditions: minor surface loss, significant surface loss, minor efflorescence, significant efflorescence, visible moisture, open mortar joints, through-masonry cracks, and cracked bricks. Exterior walls were likewise examined visibly, but were also examined using a sounding hammer for detachment of both the interior layers of stucco and the exterior layers. Each condition was pre-assigned a simple hatch mark and the conditions were marked on the plastic sleeves on top of the corresponding photographs. The images were then scanned so that they could be digitized. (See *the "Glossary of Conditions and Construction Campaigns"* immediately following this section *and also in Appendix B.)*

In addition to recording visible conditions, the various construction campaigns for the brick masonry were also recorded so that this information could be correlated with information regarding condition. Like the conditions survey, the construction campaigns survey featured a large amount of visual observation by the surveyor. However, unlike the conditions survey, it also made use of the archival synthesis created by performing historic research. It also made use of architectural plans and elevations uncovered during the archival research, which contained important information about repair work.

A key was developed to identify the historic campaigns largely based on their respective mortars. The mortars were chosen as this metric based on their visual differences: their color ranged from almost pure white, to a concrete gray, to a beige-tan, to a dark black, and the consistency was varied as well. Six different mortars were ultimately identified and matched to their respective restoration campaign years, as follows: earliest existing construction; 1948 Koch & Wilson repairs/restoration; 1972 Labouisse repairs/restoration; 1982 Brockaway repairs; 1996 N-Y Associates restoration/repairs; and an unidentified gray spot-pointing.

Visually matching the existing mortars to these specific construction campaigns was a relatively challenging task, as none of the archival building specifications explicitly made clear what color mortar was used. The task had to be carried out primarily by using context clues and processes of elimination. Certain mortars were found only underneath other mortars, and thus could be dated to an earlier period. Some of the historical architectural drawings, specifically those for the 1972 and 1996 work, did identify areas of re-pointing work and brick replacement. The information on the historic drawings could typically be confirmed in the field and was recorded during the survey.

Following the field survey, the information collected on conditions and construction campaigns was digitized and synthesized in order to produce both a digital and printed record of this information. Both digital (on CD-ROM) and printed versions of this documentation will be submitted with the final report and should be maintained at the LSM Archives for future reference and use. The

printed versions of all survey forms, illustrating conditions and construction campaign information, is included in *Appendix B* of this report.

To digitize both the wall conditions and the construction campaigns documented during the field survey, each of the clear plastic sleeves on which the conditions were recorded were scanned and the information was then was transferred into in *AutoCAD Architecture 2012 Student Edition*. The outline of each wall was drawn from the (1996) HABS plan produced by students at Tulane University. These outlines were used to scale the photographs of each wall. The color photographs used in the assessment of the walls were converted to black and white photographs using the "Darker" Black and White Photoshop filter. The photographs were saved as JPEGs and inserted into an *AutoCAD* file and scaled to 1:1.

While looking at the scan of a wall and plastic sleeve, each condition was manually recorded on a separate layer by tracing the brick on the photograph. Each layer was assigned a color to match the pre-assigned colors of the assessment. Conditions that required a hatch were given a hatch closest to the pre-assigned hatch. The brick construction campaigns were recorded on a separate black and white image., and were placed on a separated layer according to date. The hatch for each construction campaign is solid and has a transparency percentage of 60-75.

The pages containing each wall's conditions and construction campaigns were plotted as DWG to PDF, allowing the layer to be printed and remain active in the PDF (Note: To retain the transparent hatch of the brick campaigns, it was important to click the "plot transparency" in the "plot options."). The result is a PDF image that can be manipulated to show select pieces of information.

On the printed version of the wall conditions, all the conditions are visible. However, on the digital copy, in *Adobe Acrobat Pro*, the layers can be turned on and off to highlight any one condition or to show the relationship between specific conditions.

In order to use the digital file included with this report, follow these steps:

- In Adobe Acrobat Pro, on the left hand side is a Layers tab (two overlapping squares). By clicking this tab the layers should be visible.
- If the Layers tab is not visible then it can be turned on by going to the View tab at the top of the page and the Show/Hide. Next click on Navigation Panes and the Layers. The Layers tab is on when there is a check next to the word Layers in the Navigation Panes.
- To turn on and off each layer click the box to the left of layer. When the "eye" is visible then the layer is visible.
- If you are still unable to view the separate layers, you may be in Adobe Acrobat or in a version of Adobe Acrobat Pro that does not support the version this PDF.

Conditions Glossary

Condition:
Minor Surface Loss



Definition:
Loss or scaling of brick surface resulting in loss of fireskin and portion of brick interior. Loss measures < 1/4” in depth (compared to adjacent brick surfaces).

Hatch:

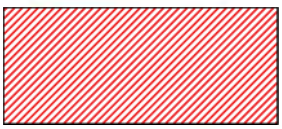


Condition:
Significant Surface Loss



Definition: Loss or scaling of brick surface resulting in loss of fireskin and portion of brick interior. Loss measures > 1/4” in depth (compared to adjacent brick surfaces).

Hatch:



Conditions Glossary



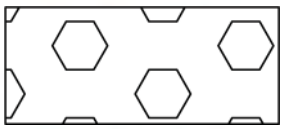
Condition:

Minor Efflorescence

Definition:

Evidence of efflorescence (salts) in the form of white haze or powder on bricks and/or mortar.

Hatch:





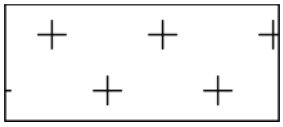
Condition:

Significant Efflorescence

Definition:

Evidence of heavy efflorescence (salts) in the form of crystals or flakes on bricks and/or mortar.

Hatch:



Conditions Glossary

Condition:

Visible Moisture

Definition:

Presence of a change in color or saturation of the masonry indicating active or recent water infiltration, including presence of biological growth.

.

Hatch:





Condition:

Open Mortar Joint

Definition:

An open mortar joint has a loss of mortar to a depth of ½” or more

Hatch:





Conditions Glossary



Condition:

THROUGH-MASONRY CRACK:

Definition:

Linear fracture that extends through multiple brick units and that is greater than or equal to 1/4” in width.

Hatch:





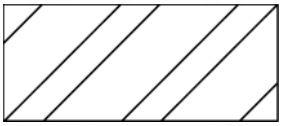
Condition:

Cracked Brick

Definition:

Fracture(s) in brick that appear to extend through entire unit (Note: this does not include fine cracks/compaction lines associated with original molding process).

Hatch:



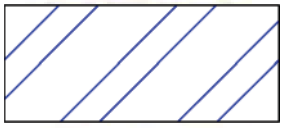
Conditions Glossary

Condition:

Stucco Detached Top Coat :

Definition: All layers of stucco are detaching from the wall..

Hatch:





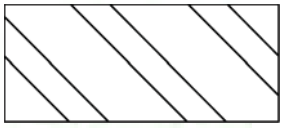
Condition:

Stucco Detached Inner Coat

Definition:

The interior layer of stucco is detaching from the exterior layer.

Hatch:





Conditions Glossary

Condition:

Complete loss of Stucco

Definition: All layers of stucco are missing leaving a brown layer visible underneath

Hatch:





Campaigns Glossary

Campaign:
Original Mortar

Hatch:



Campaign:
Koch & Wilson
1948

Hatch:



Campaigns Glossary

Campaign:
Labouisse
1972

Hatch:



Campaign:
Brockaway
1982

Hatch:



Campaigns Glossary

Campaign:
NY Associates
1996-1998

Hatch:



Campaign:
Unknown Spot Mortar

Hatch:



3.2.2 Moisture Survey and Investigative Probes (Cores)

Infrared thermography was also used to image moisture in select interior brick walls of the ground floor of Madame John's Legacy. This work was completed by Cypress Building Conservation over a period of three days from Monday, August 5 to Wednesday, August 7, 2013. The thermographic survey was completed in conjunction with the installation of three temperature and relative humidity sensors in the wall core and a soil moisture sensor at the base of wall 281-NE4. The readings from these sensors will be used to determine the effectiveness of infrared thermography to map the internal moisture content of the brick walls using surface temperatures. (*Figure 5*)

The moisture mapping methods in this report provide the Louisiana State Museum with a non-destructive testing procedure to locate moisture infiltration through the surface of the brick walls. Thermal cameras measure the amount of emitted thermal energy from a material surface. The camera software generates a temperature map based on the amount of emitted thermal energy that reaches the camera sensor. Wall surfaces with large thermal differences between two connected elements or areas are an indication moisture content variances. Surfaces with areas of increasing moisture content appear as cooler areas in the infrared images due to the effects of evaporation (surface cooling). After moisture infiltrates the wall, it evaporates leaving efflorescence or salt crystallization on the brick surface. Salt crystallization, on the interior and exterior of the porous brick and original mortars, has caused accelerated damage. Determining the patterns of moisture infiltration across wall surfaces will provide the Louisiana State Museum with a method to develop conservation treatments to stop further efflorescence from occurring. Additionally, scaled infrared images captured of the wall surfaces under different environmental conditions will provide the Louisiana State Museum with a nondestructive method to test how changes in the exterior and interior environment affect moisture infiltration and salt deposition on the brick surface.

The camera used for all infrared imaging was the FLUKE Ti32 Thermal Imager. This camera has a 320 x 240 uncooled micobolometer focal plane array and the temperature measurement range for this camera is -20°C - 600°C with an accuracy of +/- 2° C at 25° C. The thermal sensitivity of the camera allows for 76,800 individual temperature measurements and the detection of temperature variations of .004° C on a sample surface. This camera has a field of view of 23' x 17' and a minimum focus distance of 18". The Fluke Ti32 camera captures both an infrared thermogram of emitted thermal energy between 7.5 μm to 14 μm wavelengths and also a visible light image of the same field of view. FLUKE cameras have a patented IR Fusion technology that allows for the storing of a full visual image which can be displayed, blended and stored with each IR image. Thermal and visual images can be presented simultaneously as a full infrared image or as a Picture-In-Picture (PIP) image in various blend modes. This feature greatly enhances the ability to depict both real time and computer enhanced thermographic images allowing for the isolation of thermal anomalies on a sample surface.



Figure 5. A handheld infrared camera, a *FLUKE Ti32 Thermal Imager*, was used to image temperature and potentially moisture in select interior brick walls of the ground floor.

Investigative Probes (Cores)

In addition to the thermal imaging to provide information about moisture content in the walls, investigative probes were performed in a total of six locations to document wall construction and condition. The probes were in the form of cylindrical cores taken through the brick masonry of two walls: an interior wall between Rooms 281 and 283 (wall numbers 281-SE-1 and 283-NW-1) and an exterior wall between Room 282 and 277 (wall number 282-NE-2). These two walls were selected as probe locations because they were felt to be representative of the walls throughout the ground floor in terms of condition and location (i.e. interior or exterior walls). The cores were taken by preservation contractor Andrew Palewski using Hilti DDI50 Diamond Core Drilling System, with the addition of water to facilitate the cutting process. (*Figure 6*)

For the interior wall 281-SE-1/283-NW-1, three 2-inch cores were removed at the following heights (from the existing brick floor): 1'-6", 3'-2" and 5'-3". The cores produced were 1-3/4" in diameter. The cores were taken completely through the masonry, from the face of wall 281-SE-1 to the face of wall 283-NW-1, and measured 14-inches (the total thickness of the wall). In addition, the very top of the wall (at 7'-0") was visually examined and a sample of the center of the wall in this location removed.

For exterior wall 282-NE-2, one 1-inch core was taken 2'-0" from the floor, while two 2-inch cores were removed 3'-8" and 5'-6" from the floor. The 1-inch core drill bit produced a 7/8" diameter core. A sample at the top of the wall (at 7'-0") was also removed from the center of the wall by hand. The cores in this location were only taken through approximately the inner two-thirds of the wall, so as not to produce holes in the wall that would be open to the exterior. The wall in this location measures approximately 18-inches, so the partial cores removed from his wall measured between 12-inches to 15-inches.

For each wall, cores were removed from three different heights in order to gain an understanding of wall condition and also so that samples of masonry at various heights could be examined for salt content in the laboratory. As will be discussed in *Section 4.2* of this report, the walls show a distinct deterioration pattern that varies with the height of the wall. The deterioration is presumably related to salt content, which may vary with the height (and depth) of the wall. Therefore, core samples were removed in a way to allow a profile of the wall's condition and salt content to be generated.

As the cores were removed from the wall (typically in pieces), they were laid out on a piece of paper to allow them to be immediately photographed. The cores were kept as intact as possible so that the basic construction of the wall in each of the core locations could be documented. Because the cores tended to fall apart during the removal process, each piece of each core sample was labeled with a distinct letter so that its location within the wall could be documented. The cores were then placed in sealable plastic bags, with each part of each core labeled and bagged separately.

The cores were then taken to BCA's conservation laboratory for further examination and testing for salt content.

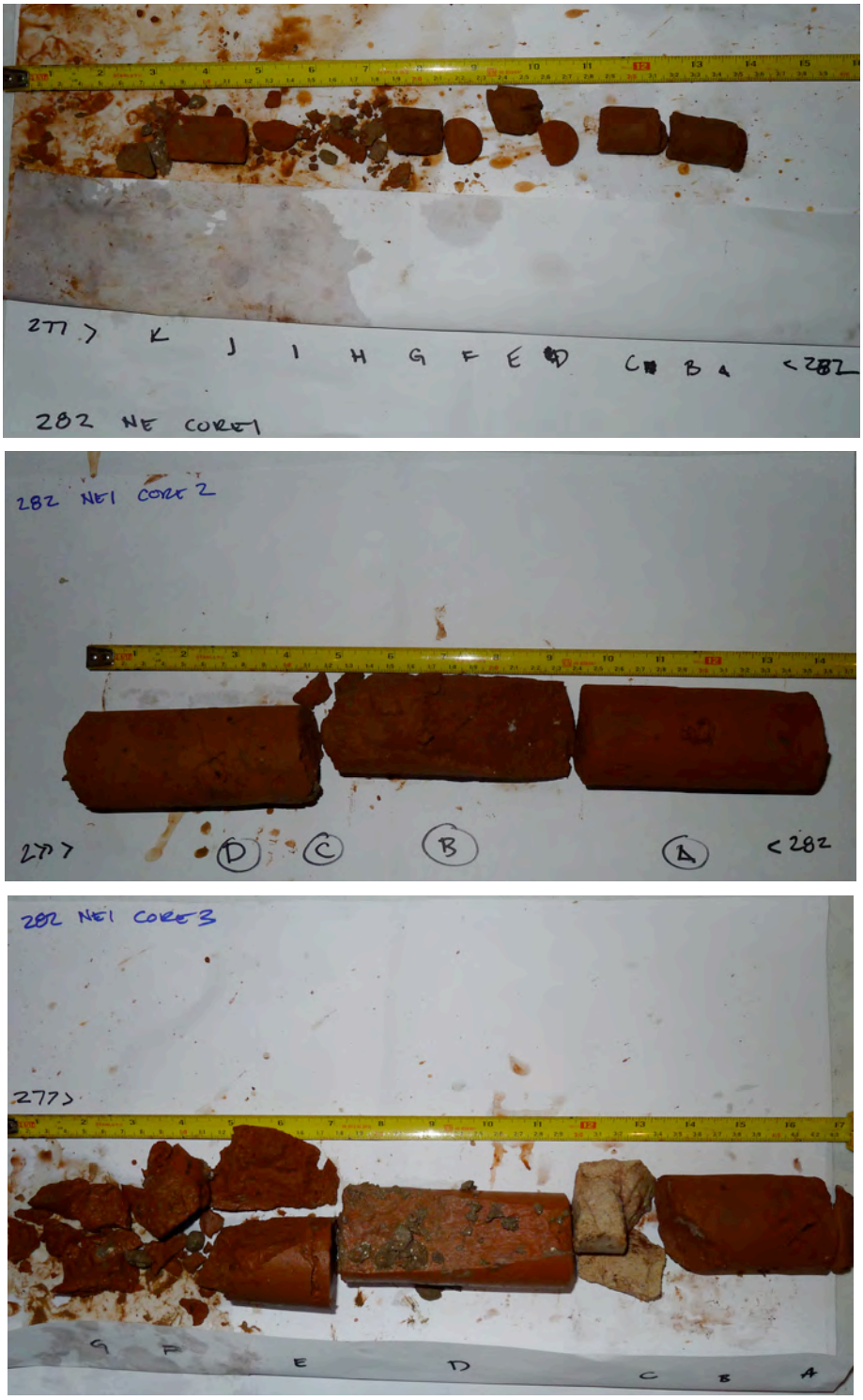
See *Figure 7-12* for documentation of the appearance, condition and dimensions of each probe. *Figures 40-41* provide additional documentation of the cores, correlating their location with wall construction and salt content information.



Figure 6. Coring of wall 281-SE-1 using a 2-inch diamond core drilling system.



Figures 7-9. Core samples of Wall 281-SE-1. Core 1 (top) removed 1'-6" from the floor; Core 2 (middle) removed 3'-2" from the floor; and Core 3 removed 5'-3" from the floor.



Figures 10-12 Core samples of Wall 282-NE-2. Core 1 (top) removed 2'-0" from the floor; Core 2 (middle) removed 3'-8" from the floor; and Core 3 removed 5'-6" from the floor.

3.2.3 Archaeological Investigation

One of the goals of the current study was to assess both subsurface conditions around the brick walls of the primary structure and the conditions of the brick foundations themselves, in order to gain more information about conditions that may be affecting the brick masonry walls. Per Louisiana's *Archaeological Resources Act* (R.S. 41:1606), a Cultural Resources Investigation Permit from the Louisiana Division of Archaeology is required for any ground-disturbing work performed on site at Madame John's Legacy. Therefore, Dr. Ryan Gray from the University of New Orleans, Department of Anthropology, was retained to conduct a series of archaeological excavations on site in conjunction with the conservation effort. A secondary goal of this archaeological assessment would be to expand the body of archaeological data from this important historic site. After consultation regarding the goals of the project, Dr. Gray presented a technical proposal to the Louisiana Antiquities Commission in June of 2013 and was granted a permit to excavate 3 1 x 1 m units within the interior of the primary structure's ground floor. All of these documents will be provided as appendices to the draft report of investigations to be submitted to the Louisiana Division of Archaeology. Archaeological fieldwork at Madame John's Legacy began on 1 August 2013 and concluded on 27 August 2013.

As discussed in the Summary of Findings presented in *Section 4.2.3*, the present investigations draw upon previous work at the site, including Richard Shenkel's "Archaeological Investigation of Madame John's Legacy, 1971" manuscript on file at the University of New Orleans (n.d) and Shannon Dawdy's report "Madame John's Legacy (16OR51) Revisited: A Closer Look at the Archaeology of Colonial New Orleans" submitted to the Friends of the Cabildo and the Louisiana Division of Archaeology in 1998. The present investigation also supplements this previous work with data gained from the excavation of these units. Most of the previous work was limited to the exterior courtyards and service building/dependency areas of the city lot on which Madame John's is located (with some exceptions discussed later in this report). However, the units included in the current investigations are located on the interior of the building. Units A and B, each measuring 1 x 1 m, were placed alongside two interior walls on the northwest (or grid west) side of the building, with one along the back interior and the other along the front interior of the walls (*Figure 13*). A third smaller unit (Unit C) was placed along a wall near the center of the building, primarily to allow for the installation of a subsurface moisture monitor.

The present units serve a number of goals related to the current preservation efforts at the site. Units were placed alongside interior walls so that they could provide more complete information about the subsurface conditions and soils directly associated with those walls. Special samples were taken of major soil units for possible testing and analysis, in order to determine any special characteristics that may be differentially affecting wall preservation. At the same time, the excavations have helped to confirm the basic stratigraphic sequence in the building interior and the depth and extent of brick foundations. While the foci of excavations were the foundations themselves, rich deposits associated with the lot's eighteenth-century history were uncovered in

the units, with the period of the 1788 fire especially well represented. In addition, pre-fire deposits were found in both Unit A and B, with these providing a window, however small, into the early colonial period of New Orleans.

As noted above, three units were opened during the present investigations. These units were designated Units A, B, and C in order to differentiate them from Shenkel's and Dawdy's previous work at the site. All three had originally been planned as 1 x 1 m units, but the third was eventually scaled back in size, as detailed in the discussion of Unit C in *Section 4.2.3*. All unit elevations were measured in reference to a datum string placed at 10 cm above ground surface. However, the 1990s renovation that resulted in the present floor surface has provided an unusually level starting point for excavations. As a result, measurements in all units are immediately comparable, as the variation in floor elevation within the structure is minimal. All directional notations are based upon a grid north following the existing street grid, with the Dumaine Street frontage representing grid north.

All hand excavation units were excavated according to natural strata, with each stratum sub-divided into levels not exceeding 5 cm in thickness, in keeping with the methodology defined by Dawdy previously. All units were excavated to sterile subsoil, with the exception of Unit C (described in *Section 4.2.3* below). At the bottom of each level, units were planned and photographed. In each unit, a 5 L soil sample will be taken from undisturbed natural strata for flotation. A portion of this sample was collected for possible chemical analyses, in keeping with the goals of the Tulane Preservation Studies project. All other excavated soil was screened through ¼ in (0.64 cm) wire mesh. Brick, oyster shell, and construction materials recovered during screening were weighed and discarded in the field after a representative sample had been removed. All other cultural materials were bagged and processed as described below. Upon completion of each unit, at least two contiguous profiles were drawn, and all profiles were photo-documented in order to illustrate site stratigraphy. The Harris Matrix system was used to document and record all excavated stratigraphic and feature contexts. All features uncovered in hand excavation units were planned and photographed, and feature fill was excavated separately.

It should be noted that, when working in interior spaces like this, the lack of natural lighting is a distinct problem in excavation. In this case, although electric lights are installed in the downstairs interior, they often caused problematic shadowing and were insufficient for photography. Attempts were made to rectify this by using flash photography and/or additional utility lamps with varying degrees of success.

The summary of findings presented in *Section 4.2.3* and in *Appendix D* present in brief form the results of the field investigations at Madame John's Legacy. The information provided in the current report will be expanded with additional graphics and interpretive data on history, material culture,

and chronology along with the results of specialized analyses in a draft report to be provided to the Louisiana Division of Archaeology, Baton Rouge, Louisiana at a future date.

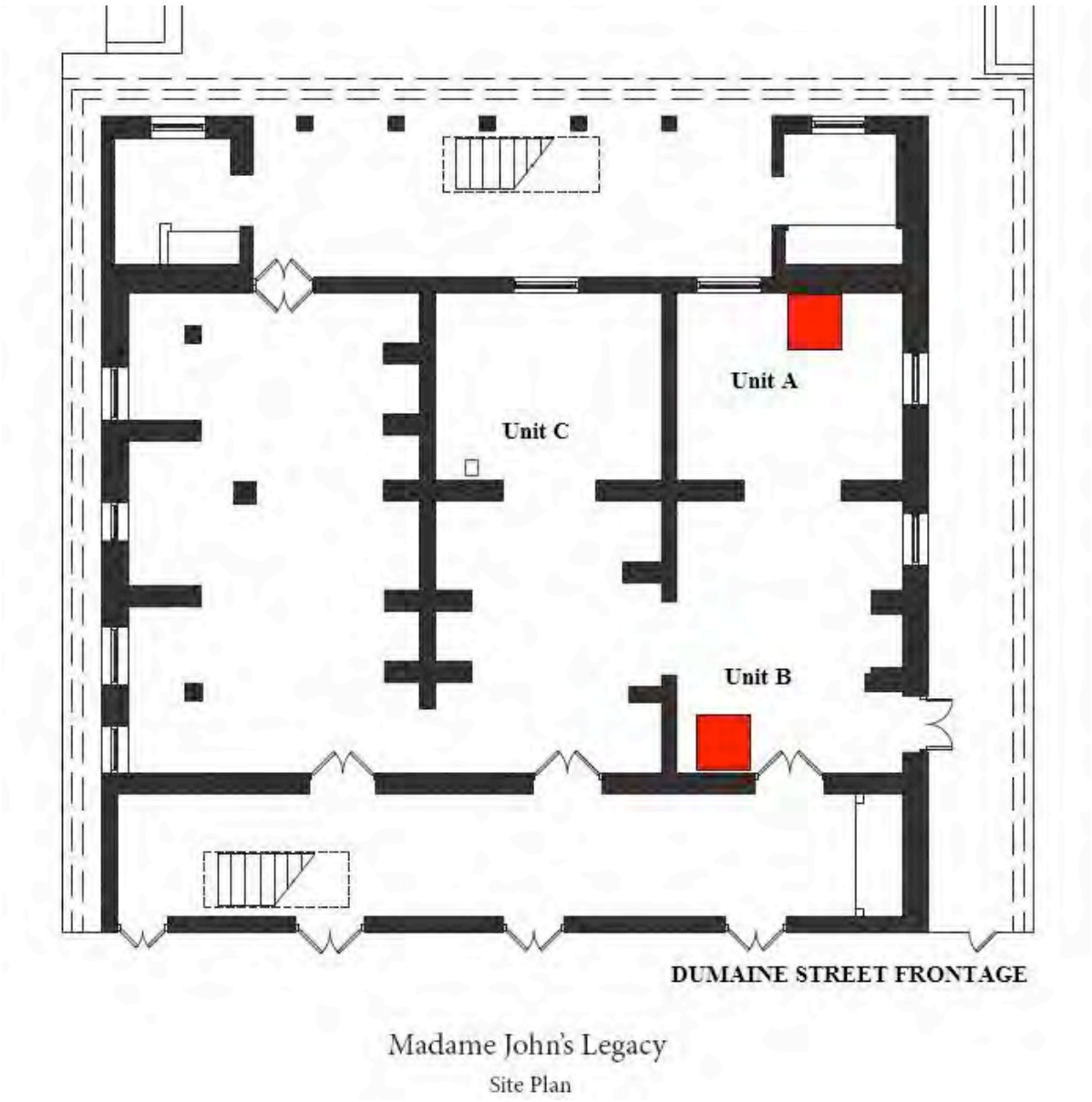


Figure 13. Site plan of Madame John's Legacy showing locations of present investigations in interior of building. Full units are filled in red, and partial unit is outlined in red. Grid north referenced in all excavation discussions is towards Dumaine Street frontage. Approximate scale: 1 cm=4 m.

3.3 Laboratory Analysis

3.3.1 Analysis of Masonry Materials

Following the previously-discussed review of historical documentation and conditions assessment, the building was physically examined for intact areas from which representative samples of masonry materials could be removed. Samples were taken from historic brick, mortar and stucco, with the goal being to characterize these materials and identify any inherent flaws that they may possess. Understanding the composition and characteristics of masonry is an integral part of understanding its condition, how it reacts to extrinsic factors such as moisture and salt, and its deterioration.

A total of five representative samples of the masonry materials were removed from the building using a hammer and chisel: two brick samples, two brick mortar samples and one stucco sample. The brick and mortar samples were removed from intact areas that have not been altered or re-pointed, such as the southwest wall of the ground floor of Madame John's Legacy, in a closet in the current south cabinet. This area, although somewhat deteriorated and damp, retains its original brick and mortar and has not been re-pointed like the rest of the walls of the ground floor. A list of all masonry samples analyzed as part of this study, and a description of the location from which they were removed, is included below. The goal of removing samples from this location was to be able to identify and characterize the building's original construction materials. Although essentially all of the brick masonry has been re-pointed, original mortar remains as bedding mortar at the center of the wall in the majority of the walls (as discussed in *Section 4.2.2*). The stucco sample was removed from the northwest elevation, from an area underneath later stucco. The stucco sample is believed to be early but may not be original to the building. (*Figures 14-19*)

Cursory visual examination of the masonry samples was performed by BCA to preliminarily characterize the materials prior to submitting them to Highbridge Materials Consulting, Inc. for supplemental laboratory analysis. Highbridge performed petrographic examination of all five masonry materials. The goal of the analysis was to identify constituent components and assess overall quality. Although Highbridge's findings are summarized in *Section 4.3.1* of this report, copies of their full reports (including methods of examination and data for each analysis) have also been included in *Appendix F*.

The petrographic examination of the brick was conducted in accordance with the standard practices contained within ASTM C856. Though written specifically for portland cement concrete, the methods are applicable to any material consisting wholly or in part of inorganic or crystalline materials. Data collection is performed by a degreed geologist who by nature of his/her education is qualified to operate the analytical equipment employed. Analysis and interpretation is performed or directed by a supervising petrographer who satisfies the qualifications as specified in Section 4 of ASTM C856.

The petrographic examination of the mortars and stucco was conducted in accordance with the standard practices contained within ASTM C1324. Data collection was performed by a degreed geologist who by nature of his/her education is qualified to operate the analytical equipment employed. Analysis and interpretation is performed or directed by a supervising petrographer who satisfies the qualifications as specified in Section 4 of ASTM C856.

MJL.Masonry.1	Bedding/pointing mortar from south brick chimney in attic (interior location)..
MJL.Masonry.2	Bedding/pointing mortar from ground floor level brick masonry, rear (southwest) elevation.
MJL.Masonry.3	Exterior stucco, northwest elevation, 14" from grade.
MJL.Masonry.4	Brick from ground floor level brick masonry, rear (southwest) elevation. Same as sample MJL.Masonry.2.
MJL.Masonry.5	Brick from ground floor level brick masonry, rear (southwest) elevation, l. Same as sample MJL.Masonry.2.



Figures 14 and 15. Location of sample MJL.Masonry.1, mortar moved from the brick chimney in the attic.





Figure 16. Location of sample MJL.Masonry.2, mortar moved from the brick masonry of the rear elevation of the building (now enclosed in a closet.).



Figure 17. Location of sample MJL.Masonry.3, stucco removed from the northwest elevation





Figures 18 and 19. Location of sample MJL.Masonry.4 (above) and MJL.Masonry.5 (below). Both brick samples were removed from the same portion of the wall shown in Figure 16 above.

3.3.2 Analysis of Salts

Because the presence of salts is known to be one of the primary causes of the brick deterioration at Madame John's Legacy, gaining additional insight into the types and quantities of salts present was felt to be important. Soluble salts (salts that dissolve in water) are a concern for porous masonry like brick because of damage caused by two different phenomenon, crystallization and hydration, both occurring on the micro-scale inside the pores of the masonry. When a salt in solution reaches its point of evaporation inside the pore, it comes out of solution and forms a crystal. The crystal occupies a larger volume than the original liquid salt solution and therefore puts pressure on the walls of the pore. In the case of hydration, pressure is also generated inside the pores of the masonry, but by the absorption of moisture by a hygroscopic salt. The absorption of moisture (hydration) also exerts pressure on the surrounding masonry. Different salts have different degrees of solubility and different propensities for crystallization and hydration.[14] In addition, the dissolution and crystallization of salt is dependent on humidity and temperature variations, with repeated cycles of dissolution and crystallization causing the majority of the damage. The results of these processes, particularly the crystallization salts on and below the masonry's surface, is readily apparent on the brick masonry of Madame John's Legacy's ground floor.

Previous research performed by the Getty Conservation Institute (GCI) in 2007-08 identified the presence of salts and also experimented with the use of poultices to extract and potentially remove salts form the brick masonry (see *Appendix H* for copies of GCI research). The GCI's research, as documented in the published proceedings from the 11th International Congress on Deterioration and Conservation of Stone (2008), documented the presence of sodium sulfate salts (mirabilite and thenardite), sodium chloride, gypsum and sodium nitrate. Their sampling at various heights of the wall allowed them to conclude that the sulfates typically occur at the bottom of the wall, while the more soluble nitrates and chlorides occur higher on the wall.[15]

Although the GCI research had documented the presence of specific salts in the brick masonry of the ground floor, there were still several unanswered questions. Chief among these questions was that of the source of the various salts known to be present; a key factor to consider when developing a solution to eliminate the salts. Other questions involved wanting to know where the salts are located within the wall (height and depth) and in what concentrations (are there more salts at the center vs. the outside face of the wall, or the top vs. the bottom of the wall?). In addition, the GCI research recorded the height where their various samples were removed but not which walls they were removed from, so this key piece of information was missing. Because of the

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[14] Eric Doehne and Clifford A. Price. *Stone Conservation: An Overview of Current Research. Second Edition*. (Los Angeles, The Getty Conservation Institute, 2010),15.
[15] Eric Doehne, Mira Schiro. Thomas Roby, Giacomo Chiari, Greg Lambousy and Heather Knight. "Evaluation of Poultice Desalination Porcess at Madame John's Legacy, New Orleans". *Proceedings from the 11th International Congress on Deterioration and Conservation of Stone (Torun, September 15-20 2008),* 4.

wide range of conditions and periods of constriction that exist throughout the ground floor of Madame John's Legacy, it is important to know where such samples are removed from so that the information gained from them can be correlated to other external factors.

In an attempt to resolve some of these unanswered questions and also to supplement the GCI's research, samples were removed and subjected to laboratory analysis for salt identification. A combination of materials (brick and mortar taken from the cores removed from the walls, soil and surface salts) were collected by BCA and analyzed by Dr. George Wheeler, Research Scientist with the Department of Scientific Research of the Metropolitan Museum of Art. Dr. Wheeler used a combination of X-Ray Diffraction (XRD) and Quantofix® test strips (strips of indicator paper that allow for the semi-quantitative determination of ions and other substances) to identify the types and concentration of salts in ten samples.

A list of samples analyzed for salt content is included below and a summary of the results of the analysis is included in *Section 4.3.2* of this report.

MJL.A	Room 281, Soil sample removed from below existing brick floor and mortar setting bed, adjacent to Wall NE-4 (wall undergoing long-term moisture monitoring.
MJL.B	Room 281, Wall, SE-1. Core 1. Portion "A", outside face of wall (facing Room 281).
MJL.C	Room 281, Wall, SE-1. Core 1. Portion "D", middle of wall.
MJL.D	Room 281, Wall, SE-1. Core 2. Portion "A", outside face of wall (facing Room 281).
MJL.E	Room 281, Wall, SE-1. Core 2. Portion "E", middle of wall.
MJL.F	Room 281, Wall, SE-1. Core 3. Portion "A", outside face of wall (facing Room 281).
MJL.G	Room 281, Wall, SE-1. Core 3. Portion "E", middle of wall.
MJL.H	Room 282, Wall, NE-2. Core 3. Portion "A", outside face of wall (facing Room 282).
MJL.I	Room 282, Wall, NE-2. Core 3. Portion "E", middle of wall.
MJL.J	Room 281, Wall NE-4 (wall undergoing long-term moisture monitoring), 38" from floor, 6" from Wall SE-1. Scrapings of surface salts.

3.3.3 Analysis of Paint Finishes

As part of this project, Building Conservation Associates, Inc. (BCA) was retained to investigate the historic paint finishes of Madame John's Legacy. A previous paint study had been performed in 1983 by George Fore and the results of his analysis formed the basis for the later restoration campaign that brought the current exterior paint scheme to the building. BCA's current analysis seeks to confirm the accuracy of the findings of the Fore analysis and to evaluate the current interpretation of the early exterior paint scheme now in place at Madame John's Legacy.

As part of the current paint study, Dorothy S. Krotzer, BCA Regional Director, performed a site visit to Madame John's Legacy on March 22, 2013 to investigate the early historic finishes of the exterior of the building and collect samples. The collected finish samples were analyzed in BCA's laboratory by Christine Leggio, Staff Conservator, in consultation with Dorothy Krotzer.

In addition to physical investigation of the building and removal of samples, BCA also reviewed existing archival documentation before the site visit. This documentation included the previously-mentioned 1983 paint analysis prepared by George Fore, archival drawings and photographs, and watercolor images made of the building as part of the Historic American Buildings Survey (HABS) in the 1940's, obtained from the Louisiana Digital Library. Unfortunately, only twentieth century images of the exterior of the building were located, providing no insight into its 18th or 19th century appearance.

Most relevant to the current paint study was Fore's previous report. Fore's study found limited paint evidence on original exterior elements, however, it was able to draw some conclusions related to the building's historic paint colors and construction chronology. These conclusions include:

- The clapboard on the front gallery is not original to the building's construction, but is rather an early alteration. Fore bases this conclusion on the presence of whitewashed plaster on the brick-between-posts behind the boards.
- The clapboard on the rear gallery is original to the building's construction, based on its profile, lap, and bare masonry back up.
- The door shutters are early replacements – the originals left the transom exposed when closed, as evidenced by plugged pintle holes in the location of the original top hinges.
- The earliest existing finish on the lakeside elevation clapboard is a "medium red" most closely matching Munsell 10R 4/2.
- The earliest existing finish on all original woodwork of the front and rear galleries is a "medium green yellow" most closely matching Munsell 2.5Y 5/2.

In order to investigate Fore's findings, approximately 20 samples were removed from the building from areas that BCA determined likely to have early paint layers. The samples were removed from

the front and rear galleries, as well as the lakeside elevation, and taken back to BCA's conservation laboratory for analysis. Finish samples were collected from wooden elements on the exterior of the building. Sampled elements include clapboards, ceiling boards, rafters, and door and window frames from the front and rear galleries, as well as clapboards on the lakeside elevation and the shutters on the front gallery. A list of all samples removed and their location is included in *Table 1*.

All finish samples were initially examined in reflected light using a Nikon high-resolution stereomicroscope SMZ-1500 with variable magnification (16x-160x) to identify which samples would be embedded and sectioned for analysis. The selected samples were then mounted in a commercial polyester/methacrylate resin polymerized with a methyl ethyl ketone peroxide catalyst (Bioplast®). Embedded samples were sectioned on a Leco® VC-50 micro-saw for microscopic examination. The sectioned samples were dry-polished using a series of fine Micromesh® polishing cloths ranging from 6,000 to 12,000 grit. Sectioned samples were observed under a Nikon 50i compound microscope in both visible light filtered through a daylight correction filter and ultraviolet light. The ultraviolet light was generated by a mercury illumination system filtered through a violet filter cube (EF4 V-2A Ex400/40 Dm430 Bar 450). Photomicrographs of representative samples were taken using a 5 mega pixel Nikon DigiSight color digital camera system and are included in this report to illustrate specific observations.

The chromachronology for each paint sample is recorded in *Appendix I.* The earliest layers were identified and matched to the Munsell Universal Color System as well as to the closest matching Benjamin Moore paint color. The color matches are included in *Section 5.3* of this report.

Table 1. Madame John's Legacy. List of Exterior Finishes Sample Locations

Sample No.	Description	Notes
MJL.1	Lake side elevation, clapboard at top of wall under roof, between front two windows.	
MJL.2	Lake side elevation, clapboard, fourth from top of wall above front window.	
MJL.3	Rear elevation, ground floor level, lower sill plate, adjacent to brick wall below.	No viable finishes information
MJL.4	Rear porch, second floor level, top clapboard just under ceiling.	
MJL.5	Rear porch, second floor level, top clapboard just under ceiling.	
MJL.6	Rear porch, second floor level, 1970s clapboards/infill.	
MJL.7	Rear elevation, ground floor level, parged/painted brick wall.	No viable finishes information
MJL.8	Rear elevation, ground floor level, wood wedge between sill plates.	No viable finishes information
MJL.9	Rear porch, second floor level, door frame (river side of door).	
MJL.10	Rear porch, second floor level, ceiling board.	
MJL.11	Rear porch, second floor level, window on the lake side of door, frame.	
MJL.12	Rear porch, ceiling joist.	
MJL.13	Front porch, second floor level, rafter above bracket at river end of porch.	
MJL.14	Front porch, second floor level, river side window, frame.	
MJL.15	Front porch, second floor level, bracket at river end of porch.	
MJL.16	Front porch, second floor level, top of third clapboard from ceiling, adjacent to river side window.	
MJL.17	Front porch, second floor level, river end clapboard below ledger that supports joist.	
MJL.18	Front porch, second floor level, ceiling board near river end of porch.	
MJL.19	Front porch, second floor level, clapboard under joist ledger.	
MJL.20	Front porch, second floor level, window shutter at river end.	
MJL.21	Riverside elevation, stucco under later gray stucco.	No viable finishes information

3.4 Monitoring of Environment and Moisture

Deployment of Dataloggers and Sensors for Wall and Soil Moisture Monitoring

The intent of the monitoring effort is to determine the variation of the vertical gradient of wall moisture over one year and to determine the extent to which variations in wall moisture are influenced by variations in soil moisture and variations in room relative humidity. The moisture readings in the wall, soil and air will provide an understanding of the dynamic exchange of moisture liquid and vapor between the wall and its environment. Understanding the dynamic moisture exchange, combined with material testing information on the brick, mortar, soils and salts will inform the selection of potential strategies to mitigate deterioration of the wall.

To this end, a datalogger and several sensors were deployed to measure wall and soil moisture at wall 281-NE-4 of basement Room 281. A second datalogger to monitor room conditions was deployed after the site visit. The wall moisture monitoring approach is a refinement of a method successfully used by W&HA at Frank Lloyd Wright's Unity Temple (1909) in Oak Park, Illinois and the soil moisture monitoring has been successfully used by W&HA at Lynnhaven House (c.1725) and the Adam Thoroughgood House (c.1700) in Virginia Beach, Virginia.

The wall and soil monitoring devices are itemized in the equipment list included in *Appendix E*.

Wall moisture can be indirectly indicated by temperature and relative humidity sensors inserted into small air chambers created in the center of the wall at various heights. The relative humidity in the air chamber equilibrates with the moisture content of the surrounding masonry, the relationship being indicated by a sorption isotherm (*Figure 20*) and the various stages of moisture uptake occurring on the generic sorption isotherm (*Figure 21*).

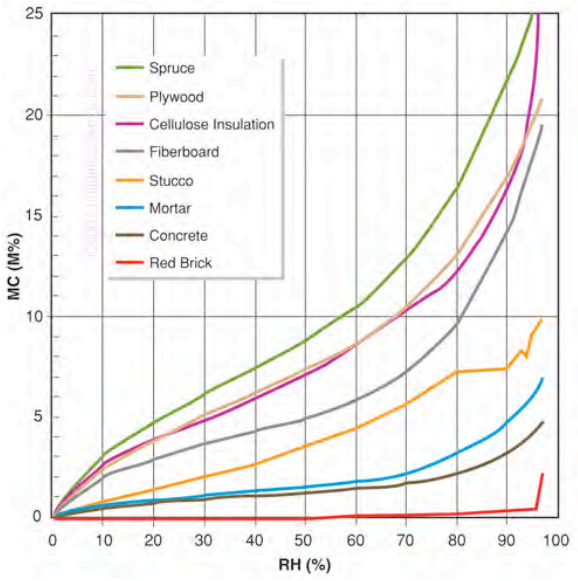


Figure 20. Sorption isotherm for typical building materials[16]

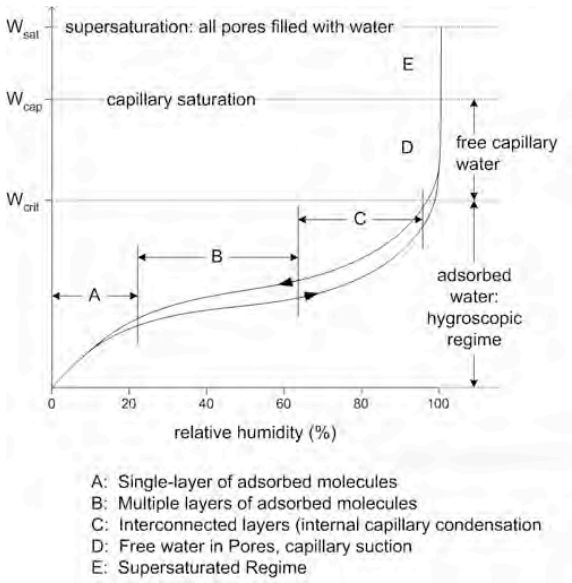


Figure 21. Material wetting/drying regimes[17]

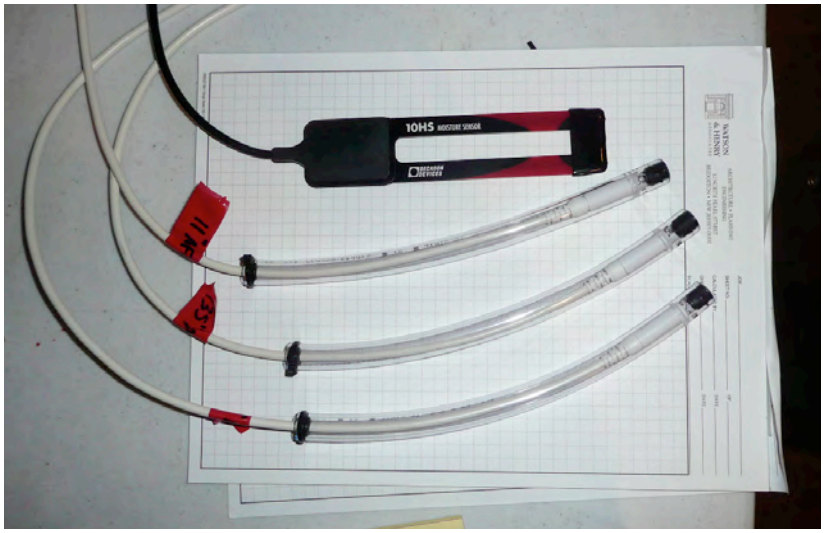


Figure 22. Soil sensor (1) and wall temperature and relative humidity sensors (3) before installation.

[16] http://www.buildingscience.com/documents/digests/bsd-138-moisture-and-materials Accessed 24 August 2013.
[17] http://www.buildingscience.com/documents/digests/bsd-138-moisture-and-materials Accessed 24 August 2013.

The moisture content along the vertical centerline of a masonry wall with symmetric cross-section, subject to below-grade moisture source and capillary transport is indicative of the highest likely moisture levels in the wall and avoids the effects of the horizontal moisture gradients between the centerline and the wall surfaces.

The intrawall relative humidity measurement will also inform analysis of the risk of salt crystallization within the masonry, once the salts are identified. The number of cycles that relative humidity in the masonry passes through the critical relative humidity value for deliquescence/acquiescence of the identified salt(s) will indicate the prospect for intrawall crystallization and/or phase change with volumetric implications.

At Madame John's Legacy, temperature and relative humidity sensors (3) and the soil moisture sensor (1) were installed at the following positions:

Sensor identification	Location, relative to finish floor (FF)
10375781 MJL281 NE4 Wall T&RH	11 inches above FF at wall center
10375782 MJL281 NE4 Wall T&RH	35 inches above FF at wall center
10375783 MJL281 NE4 Wall T&RH	61 inches above FF at wall center
10393903 MJL281 NE4 Soil Moisture	15 inches below FF, 12 inches away from wall

Henry specified the devices and compatible HOBOware Pro® Software. Krotzer arranged for procurement of the equipment through BCA. Shoriak and Williams assembled and deployed the datalogger and sensors with technical direction from Henry. Gray directed the disassembly of the floor and archaeological excavation of the floor pit for the soil sensor installation. (*Figures 22-25*)

Prior to installation, the temperature and relative humidity sensors were checked for consistency to confirm that sensor damage had not occurred during transit or assembly with the datalogger; differences in readings were well within factory specifications. The soil moisture sensor was tested by immersion in bottled water; a reading of 0.4899 m^3/m^3 was within the manufacturer's allowable range of 0.474 to 0.692 m^3/m^3 for water immersion. Free air readings were also within specification.

The wall sensors are inserted into tight-fitting plastic tubes. A space between an end cap on the tube and the sensor cap forms a small air chamber to which the sensor is exposed. The tubing wall is perforated at the chamber to allow moisture vapor exchange with the masonry. At the cable end of the tubing, an O-ring is fitted between the tube and the cable to prevent moisture vapor entry from the room. The tubing and sensor assembly are carefully inserted in a tight borehole in the masonry wall, and the small annular space between the tube and the brick is packed with putty at the wall surface.

The soil sensor is inserted vertically into the undisturbed soil below the floor assembly. At Madame John's Legacy, the floor pit was backfilled with excavated soils, compacted, then the vapor retarder applied over the fill and the floor assembly reconstructed using sand, broken concrete (in lieu of the concrete slab) and brick.

A separate datalogger was installed for measuring temperature and relative humidity of the air in Room 281 was installed by Shoriak on 23 August.

The datalogger records readings from the soil and wall sensors record conditions at one hour intervals. The room air datalogger records conditions at 15 minute intervals; a shorter interval is used for this device to detect any changes in room conditions from HVAC equipment cycling or occupancy.

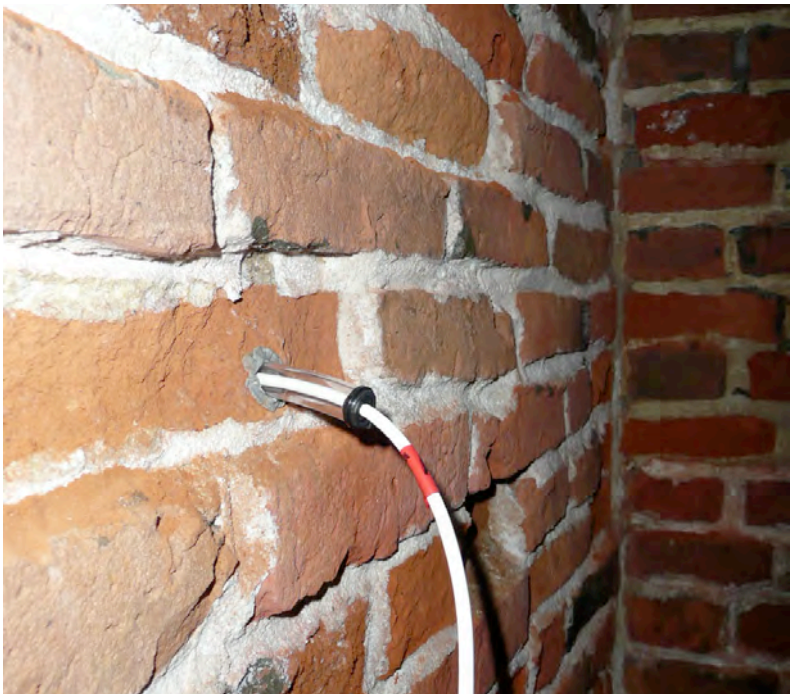


Figure 23. Wall temperature & Relative Humidity (RH) sensor installed.



Figure 24. Soil moisture sensor before backfill.

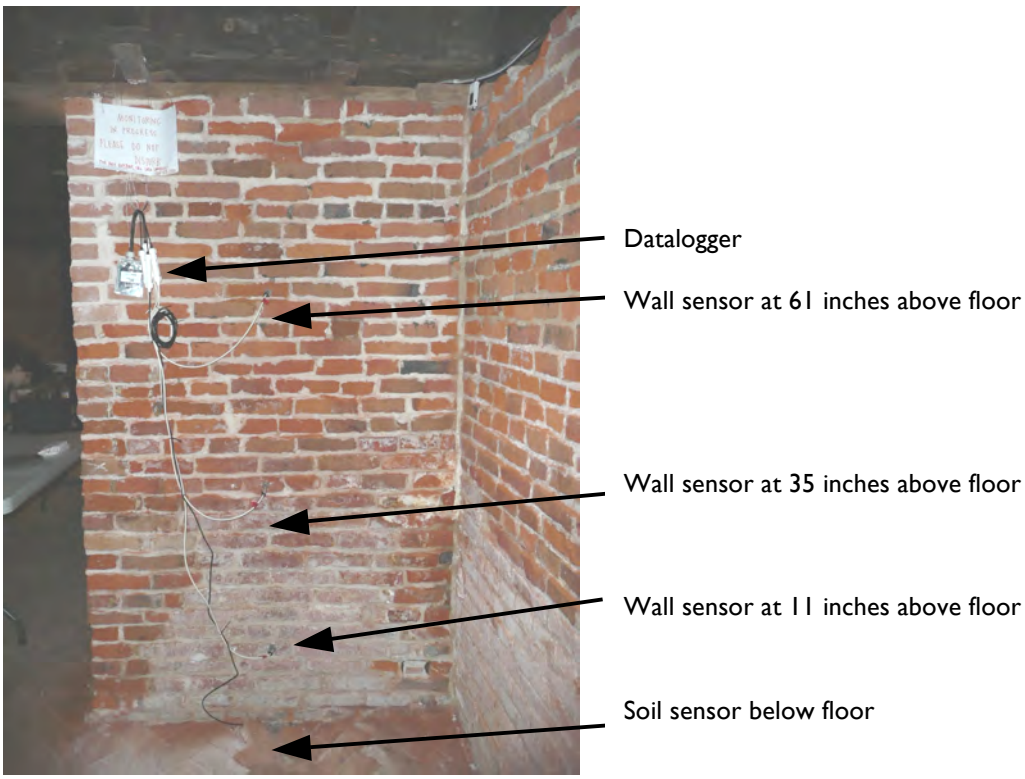


Figure 25. Completed installation.

Infrared Thermography and Moisture Detection in the Wall

Infrared thermography may provide a non-invasive method for assessing moisture content of the wall masonry; but infrared thermography cannot duplicate a datalogger function of capturing time-based trend data. At Madame John's Legacy, infrared thermography was employed in a trial application in order to comparatively assess infrared thermography with embedded sensors.

In infrared thermography, the camera reads the *incident energy* of the scanned surface. *Incident energy* is the sum of the *emitted energy* from the surface, the *transmitted energy* passing through the material behind the surface and the *reflected energy* off the surface. The *emitted energy* is indicative of the actual surface temperature, so other energy influences must be accounted for when interpreting the image.

At wall 281-NE-4 in Madame John's Legacy, transmitted energy through the wall section is nil and reflected energy from incandescent lighting is negligible, so the incident energy is essentially the same as the emitted energy. In the absence of applied thermal energy sources, the measurement is considered passive thermography.

Variations in surface temperature of wall 281-NE-4 result from the thermal energy balance of the wall with its surroundings; in the absence of rapid or large change in the environmental conditions, the thermal energy balance will approach a steady-state condition.

The thermal energy balance will be affected by:

- Thermal energy exchange between the wall and the room air resulting from: temperature difference between the wall and room air; convective air movement at the wall surface, and evaporative cooling at the wall surface due to moisture exchange with room air;
- Thermal energy balance between the wall and the soil surrounding the base of the wall, the soil acting as a slight heat sink because of its lower temperature;
- Conductive thermal energy movement within the wall due to: different materials; discontinuities or voids within the material or at contact surfaces between materials; variations in material density; and variations in moisture content.

In situations where surface temperatures are strongly influenced by moisture content, infrared thermography may be used to detect moisture gradients at or near the surface of the object; thus the interest in using infrared thermography at Madame John's Legacy.

Shoriak scanned wall 281-NE-4 using a Fluke Ti32 Thermal Imaging Camera provided by BCA; Shoriak is experienced in this device having used one for an investigation of wood deterioration. The scans were taken immediately prior to installation of the sensors.

Shoriak and Henry also carefully examined trial thermal scans and data for wall 281-NE-4. It was noted that blister-like salt crusts which are separated from the brick face by a small air pocket will give a false reading of surface temperature. This is to be expected, given the discontinuity and is general limited to select areas of the salt formations, most of the salts being attached to the brick. Spot readings at these discontinuities will occur, but in the context of scans of large areas, they are unlikely to have an impact.

4.0 SUMMARY OF FINDINGS

4.1 Archival Research

A central task of the preliminary phases of this project was the review of archival holdings related to Madame John's Legacy and the creation of a finding aid to document what information exists and where it is located. Since the Louisiana State Museum has owned the Madame John's Legacy property since 1947, a profusion of information and material has accumulated throughout their entire system. More specifically, the Madame John's holdings are vast, somewhat disorganized and physically spread out through the various Museum buildings, such as the Collections facility, the Cabildo, and the Old U.S. Mint. Thus, one of the goals of the study was to understand the scope of the holdings and create a finding aid that would help in all future searches. This finding aid is included in *Appendix A*.

The first phase of archival research focused on the holdings of Louisiana State Museum Collections facilities at 1000 Chartres Street. In particular, the files of Greg Lambousy, Director of Collections, all of which were reviewed and a list of their contents drafted. Relevant photographs, drawings, and reports related to Madame John's Legacy, and specifically the ground floor were found.

In addition to the wealth of institutional information at the Museum's office, there is also an incredible amount of popular and academic knowledge available on Madame John's Legacy by virtue of its status as one of the oldest and most recognizable buildings in New Orleans. However, information on the ground floor of the house (the area of focus for this study) was limited, as the majority of information available revolves primarily around the main (or second) floor of the house. There is also a wealth of information on the site's history of ownership, which did help in reconstructing its construction timeline.

In the review of archival holdings, there is a noticeable lack of information on the ground floor of Madame John's Legacy. Consistently, a set of building specifications or a report on the building would all but neglects the ground floor, or a set of photographs features only one or two (or more often, no) pictures representing that space. One can only speculate the reasons for this, but it may be safe to assume that its dark and dank atmosphere, its relatively plain and unfinished interior, and its historically utilitarian purpose contributed to its frequent oversight.

Despite the relative dearth of information on the ground floor, it was still possible to find some interesting clues in the Museum's files about the evolution of the building as a whole. For example, a number of extremely detailed chains of title provided information on every owner over the property's 292-year history, as well as the circumstances under which the property changed hands.

Regarding physical changes to the building, scant information was found on the earliest known restoration performed in 1948 under the direction of Richard Koch. Specifications from this restoration (including what type of cement, mortar, and brick were used) are on file at the LSM Collections facilities, but no visual representations or drawings (save for one diagram for the installation of an open-air brick drain).

One of the most significant repositories of information is another LSM-affiliated facility, the Old U.S. Mint. Since 1977, the Mint has been the home of the Louisiana Historical Center, with thousands of primary and secondary documents related to all phases and components of Louisiana history and life. For the current study, the most useful discovery at the Mint was a collection of original architectural drawings for Madame John's Legacy. The drawings on file at the Mint include: drawings from the 1972 F. Monroe Labouisse, Jr. restoration; the 1996 N-Y Associates restoration; a set of HABS drawings from 1963; and select drawings from the 1982 William Brockaway campaign of additions and repairs. Select drawings that showed specific alterations to the ground floor were scanned using a large-scale equipment at the Historical Center, but due to funding limitations, all drawings could not be scanned. However, hi-resolution photographs of all relevant drawings were taken for reference during the current project.

The holdings of Tulane University's Southeast Architectural Archives, which contains mainly letters and correspondence related to the restorations of the building, and The Historic New Orleans Collection were also visited and their holdings reviewed.

The archival research phase of this project resulted in two key products, the finding aid included in *Appendix A* and a timeline of significant alterations to the building and ground floor. This timeline, as included below, is intended to piece together the physical history of the ground floor, reaching as far back as possible, and trace its evolution to the present day. This information proved particularly useful during the conditions assessment phase of the project, when conditions were evaluated in conjunction construction campaigns.

TIMELINE OF PHYSICAL CHANGES TO 632 DUMAINE STREET

(NOTE: **Bold** indicates significant physical alteration/repair campaign of building)

1721	First buildings constructed on site (small, impermanent)
1731	Main house appears similar to current one on Gonichon's map, yet is set off the street and closer to Royal and has two flanking "pavilions"
1776	Lot is divided by the Widow Marin; corner portion of Royal is sold
1777	House sold by Marin's grandson, described as "old house with a kitchen thereon"
1783	Sold to Manuel de Lanzos; house is "worked on" & ironwork is mentioned
1788	Existing house burns in citywide fire, but is not completely destroyed; much of the surviving brick and ironwork is reused in the swift erection of a new house by American builder Robert Jones, corresponding to the present structure; it is possible the foundations may be original
1813	De Lanzos' heirs sell the property; description includes mention of front gallery
1819	Riverside gallery (no longer extant) is added to overlook the adjacent garden lot
1827	Kitchen building contracted; corresponds to present structure
1892	Property purchased by J.B. Canepa, is used as cheap apartments for immigrants
1925	Property purchased by Stella Lemann, is used as cheap apartments for artists
1947	Donated to Louisiana State Museum by Stella Lemann; basic repairs commenced (replacing fixtures, rotting wood, windows, etc.)
1948	Renovation/restoration by Richard Koch, then Douglas Freret (specs in FTP) - "rebuil[t] brick walls at ends of porch in cabinets" - "rebuil[t] front brick wall" - "to conform to the existing work of the old building. …*cut out and replace brick that have crumbled and cracked … repoint all interior and exterior walls in basement where mortar has washed out* … only as directed by the Architect." - "Magnolia cement" and Portland used for brickwork - "Second hand red brick that shall be furnished the contractor by the Owners" - Brick courtyard paved anew and open brick drains added - HVAC systems added for the first time
1965	Hurricane Betsy damages property; is deemed unsafe for public visitation
1971-72	Restored by architect F. Monroe Labouisse, Jr. and reopened - At all fireplaces, removed existing wood and rebuilt with brick arch - New "basket weave" brick floor in basement ? - General repairs to rotting wood & deteriorating brick
1982	Minor repairs done by William Brockaway - The addition of three brick piers in basement's large room for structural support of main floor. - The addition of a few supporting walls & fireboxes.
1983	Paint/finishes analysis results in current monochromatic color scheme

Early 1990s	Hydrophobic treatment possibly applied to bases of ground floor walls (according to G. Cisek)
1997-98	Restoration by N-Y Associates to deal w/ termite issues & for use as a museum space; reopened for first time in almost a decade - Extensive re-pointing & repair of basement masonry (as indicated on N-Y Assoc. elevation drawings) - Installation of moisture barrier and re-laying of brick floor - Portland stucco/parging on exterior walls (?)
2005	Damaged minimally during Hurricane Katrina; closed to the public for about a year, after which time sporadic installations & displays were its only uses
2007-08	Getty workshop on desalination effectiveness of poulticing at MJL ground floor
2012	Reopened for regular hours in September 2012

4.2 Field Investigation

4.2.1 Survey of Conditions and Construction Campaigns

The systematic visual survey of the interior brick walls of the ground floor allowed for the recordation of several key conditions related to brick deterioration. The information recorded as part of the survey documents the state of the walls at a specific point in time, allowing for future comparisons to evaluate rate of deterioration. Perhaps more importantly, however, the results of the survey can be visually assessed for patterns and clues to possible causes of the deterioration when viewed as a collection of mapped graphic information. This mapping of the condition information graphically is presented in *Appendix B* and a sample of the documentation is include in *Figure 26*. In digital form, the mapping can be manipulated so that certain conditions can be eliminated or highlighted, or certain combinations of conditions can be viewed to determine relationships. The documentation of the conditions has been kept separate from that of the construction chronology (each is presented separately in the drawings included in *Appendix B*) so that one can more easily evaluate any possible correlation between the two. In addition, where thermal images of walls were available, this image has been included along side the images illustrating condition and construction chronology. Viewing these three images in tandem often provided useful information about the relationship between moisture (as represented by range of temperature) and condition.

In addition to the masonry conditions, site conditions involving source moisture control were also recorded as part of the survey. These conditions include: the locations where water is discharged from downspouts, the locations of in-grade gutters and basins, the drainage pattern of water within the in-grade drains and on the site in general, and the locations where the gutter overflows or leaks. The location of air conditioning ducts, which are located inside walls and also below grade on the exterior of the northeast and southwest elevations, were also mapped. (*Figure 27)*

In general, numerous areas of disrepair were observed that are undoubtedly contributing to moisture infiltration into the building, particularly at the masonry walls of the ground floor. Most notably, the detached downspout and non-functioning basin leading to the storm drain observed at the east corner of the building are particularly problematic. Overflows and leaks in the roof gutter were also observed in several locations around the building and were typically associated with areas of mortar loss in the brick paving at ground level. All downspouts discharge directly onto the brick paving at the base of the walls. This configuration allows for direct entry of water into the soil below, a condition that is accentuated by the loss of mortar and brick in the paving in these locations. In addition, many leader heads for the downspouts have been clogged with bird nests. The leaking hose spigot at the south corner also produced a pervasive puddling and damp wall in this location. It was observed that the brick paving of the alleys and courtyard typically slopes away from the building, which is helpful. However, the above-mentioned conditions present a problem regardless of the proper drainage of the paving. The information regarding source moisture control

was correlated with the masonry conditions to determine the relationship between problems with source moisture control and deterioration of the masonry. (*Figures 28-30)*

Review of the graphic documentation (as presented in *Appendix B*) in conjunction with information collected on source moisture control allowed the project team to make a series of observations that help to provide insight into current conditions and the possible causes of these conditions. These observations include:

- Review of historic photographs revealed that the masonry of the ground floor has been in poor condition since at least the 1940s, the date of the earliest existing images of the ground floor interior. These images, included in a July 1949 article in the *Roosevelt Review*, show brick walls that are already in state of deterioration. They appear mottled from moisture and irregular from open mortar joints and loss of brick surface material. In addition, many areas of the walls have a white-colored surface that may be efflorescence. The white color may also be lime wash, although no evidence of lime wash was observed anywhere on the ground floor during the current study, so the white material is assumed to be salt. Interestingly, the white efflorescence is heaviest at the base of the walls in the 1940s photographs, which is quite different from the location of the current salt formation. The state of the masonry in these photos indicates that the walls have been in a state of deterioration for a long period of time, due to the combination of a highly permeable brick and mortar construction with direct exposure to salt-laden ground moisture. (*Figure 31*)
- Although the majority of the walls have been partially repaired since the 1940s photographs were taken, some information regarding rate of deterioration can be gained by comparing current and historic photographs. For instance, if one compares the 1940s and current photographs of walls 282-NE-2 and 283-NW-3, deterioration has clearly advanced in several locations, but most notable at the tops of the walls. There has been loss of brick material and also increases in open mortar joints. However, many of the brick at the bottom of the wall and brick in the worst condition in the 1940s have been replaced. (*Figures 32-33)*
- The survey of construction campaigns revealed that a large amount of the ground floor walls (close to 90%) have been repaired through re-pointing, and a large quantity of bricks have been replaced with modern and recycled brick (although the latter are obviously harder to identify). The degree of repair and brick replacement is so extensive that it poses the question of how much of the existing masonry is original or even historic.
- As discussed above, the current state of disrepair of the building's exterior water conduction system (gutters, downspouts, in-grade drainage system) is introducing water into the exterior walls as well at the ground. Standing water and damp walls were observed in numerous locations on the exterior of the building, but particularly at the southeast

elevation. This represents an additional source of moisture for the brick walls and one that can be fairly easily controlled through repair and routine maintenance, as opposed to the source moisture from the soil below the building that is a more challenging problem to remedy.

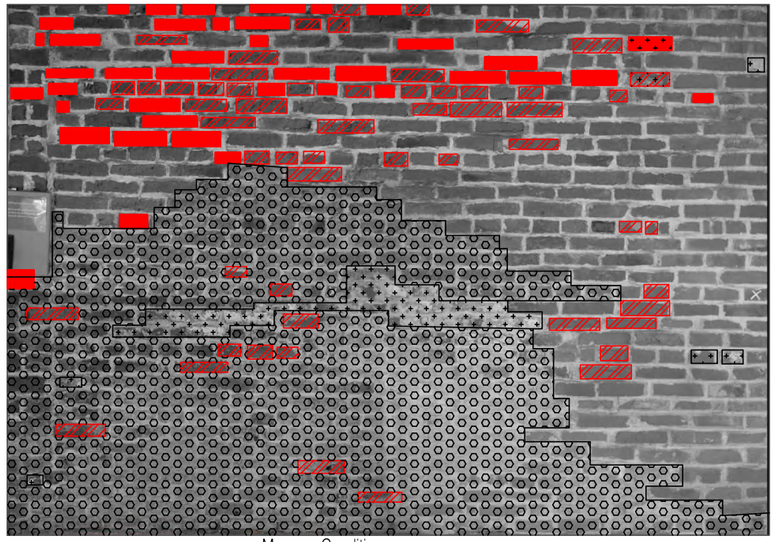
- The construction of the existing floor (as revealed by the archaeology work that occurred after the survey was completed) is exaggerating the rising damp phenomenon that the walls are experiencing. The existence of a thick cement mortar bed, plastic sheeting and several inches of sand is preventing moisture from evaporating through the floor surface and is directing the salt-laden ground moisture to the walls. (*Figure 34)*
- The effective "sealing" of the floor through the installation of the plastic sheeting, in combination with the introduction of air conditioning may have greatly reduced the relative humidity inside the ground floor spaces. However, it is possible that air leakage surrounding the windows and doors is so great that the relative humidity may not be as low as one would expect. The relative humidity in the ground floor interior has only just begun to be monitored and the collection of this data will help to understand just how dry or damp the interior environment is over the course of four seasons.
- In general, the tops of the interior walls are in the worst condition, with the greatest amount of surface loss, open mortar joints and significant salt formation. The brick on this part of the wall are typically older in appearance and may be original, or recycled historic brick. The middle of the walls typically have moderate to minor conditions, such as efflorescence and surface loss. The bottoms of the walls typically have only minor salt formation. The brick and mortar are in relatively good condition, although they appear to be composed of modern repair campaigns (namely the 1998 N-Y Associates campaign). However, because much of the bottom portion of the walls is composed of replacement brick and mortar that is presumably less porous than the original, this may be serving to trap the salt-laden moisture in the core of the wall, allowing it to escape only through the older more permeable brick located higher on the walls. This would concentrate the salt damage at the top of the walls, which is typically what seems to be occurring. (*Figure 35)*
- Walls 280-NE-1, 282-NE-1 and 282-NE-2 are considered to be in the worst condition. They have the greatest concentration of efflorescence at the tops of the walls and the most significant (three-dimensional) efflorescence. There is also significant loss of brick at the tops of these walls. All conditions are worst at the east end of wall 282-NE-2. These walls are exterior walls and are on the interior side of the wall that separates the ground floor from the foyer (Room 277). The foyer frequently has standing water, the result of rainwater blowing in from the open stairwells and doors open to the street. In addition, the foyer floor is sloped towards this wall in several places and its floor drains are currently clogged. The failed downspout and failed drain basin at the east corner of the building may also be introducing large amounts of water into the masonry at this location. (*Figures 36-37)*

- The foyer (Room 277) door that is regularly open to the public (and to the street) is parallel to the two walls with the most significant visible damage and salt formation (282-NE-1 and 282-NE-2). It is possible that the regular opening of this door promotes an air current in this location. This air current, combined with a heavy saturation of moisture in this wall (as mentioned above), may result in more frequent crystallization of salts in the wall and subsequent damage.
- Bulging of the top of wall 282-NE-2 was also observed and appears to correlate with the location of the bearing points of the floor framing above (occurring to the sides of the bearing points and not immediately parallel to them).
- Visible moisture, in the form of water droplets, was observed in multiple locations on the interior walls. It most commonly occurs at the center or lower third of the wall. The droplets of water are believed to be supersaturated solutions of salt, formed when salt crystals present on the surface of the brick absorb moisture from the air and fall back into solution (the process of deliquescence). It is unclear why the droplets typically form at the centers of the walls, but it most likely has to do with the type of salt that is forming the droplets and its tendency to locate on a specific point of the wall. (*Figure 38)*
- Original interior partition walls that are parallel to Dumaine Street (279-NE-1, 279-NE-4, 281-NE-1, 281-NE-4) are in poor condition and have had less repair work. (*Figure 35*)
- Walls adjacent to hearths or chimneys above typically have more damage, such as major loss of brick surface. This may be due to the presence of sulfate salts, which are often associated with chimneys that burned sulfur-rich fossil fuels, although the masonry was not tested for salts in this location. (*Figure 35*)
- The interior wall that runs along the southeast alley (282-SE-1, 282-SE-5, 283-SE-2) has less evidence of salts and damage than any other wall. This may be due to the fact that this wall stays moist most of the time because it is subject to a great deal of moisture infiltration and also because it is constantly shaded by the adjacent building.
- The brick columns and wall extensions installed in 1882 by Brockaway are in good condition with no signs of brick damage.

The above conclusions were made in attempt to synthesize the observations made during the field survey. More detailed information and documentation of specific conditions is included in the annotated photographs included in *Appendix B.*

Figure 26. Sample documentation of the conditions assessment and construction campiagn survey. See Appendix B for all survey documentation.

Room 277 Wall SW2



Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 1/2" = 1'

Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

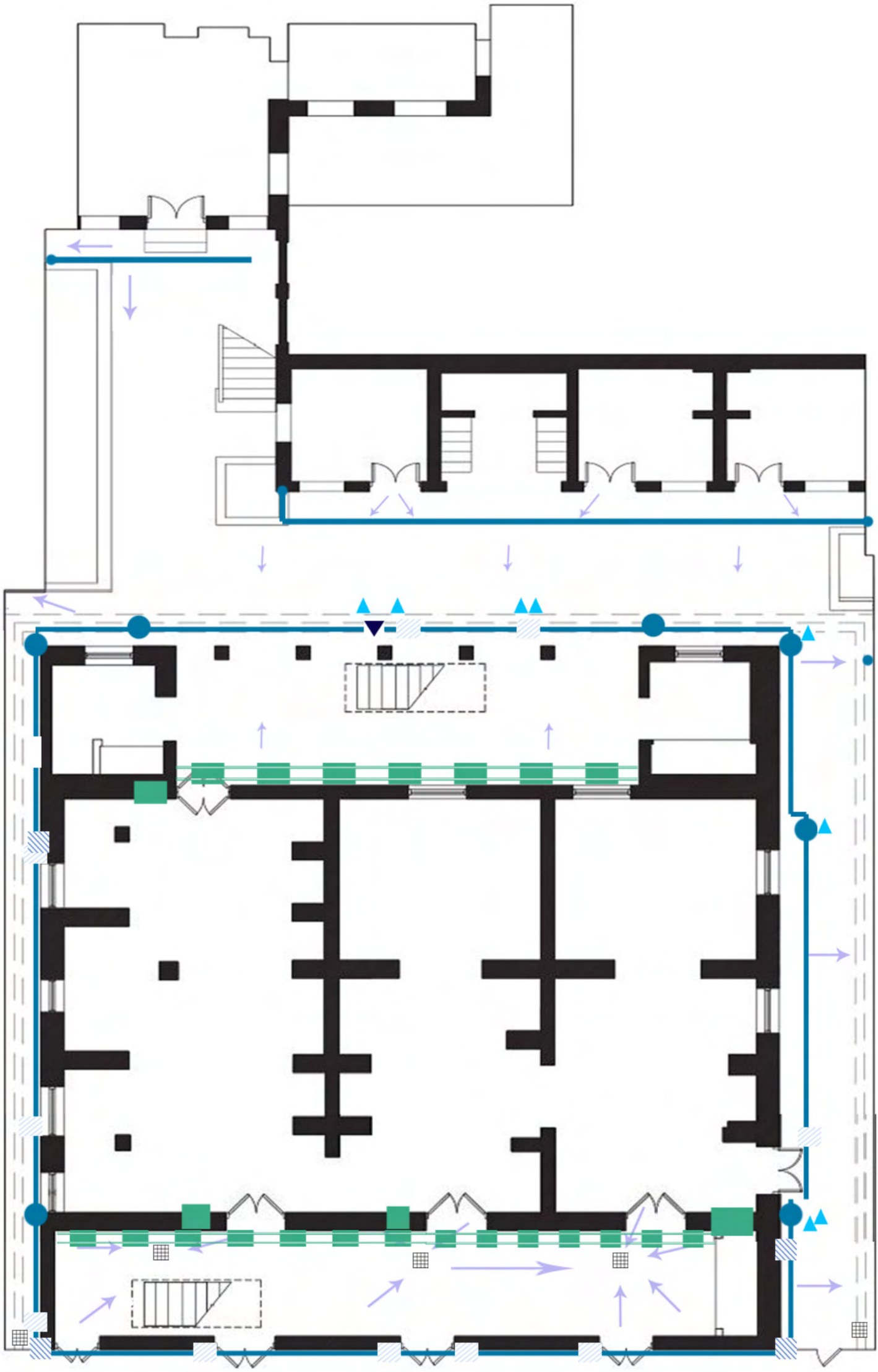
Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns



Madame John's Legacy: Exisiting Source Moisture Conditions (August 2013)

Scale 1/8"=1'



Figure 28. The downspouts discharge directly onto the brick pavement at the base of the walls. Note pigeon guano under downspout indicating it is the location of a bird nest, which is presumably clogging the downspout. A line of mortar loss is also visible in the bricks as the result of frequent overflow from the roof gutter above (arrows). There is also a hole in the gutter in this location. All of these conditions lead to the introduction of moisture below grade and into the masonry walls of the ground floor.



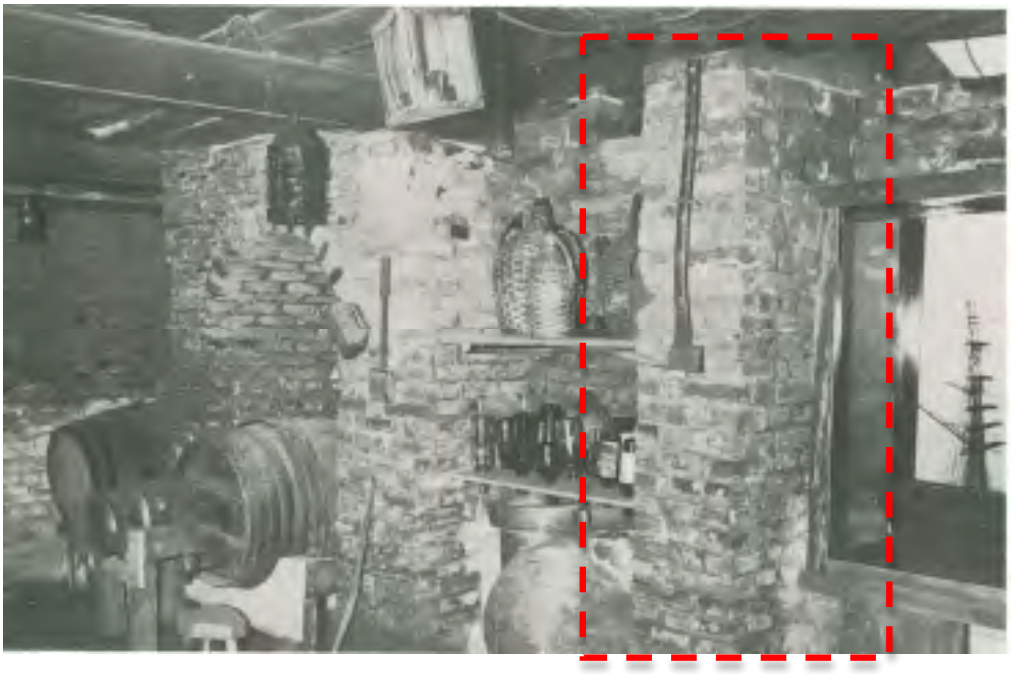
Figure 29. The leaky hose spigot at the south corner of the building results in frequent puddling and damp wall conditions.



Figure 30. At the east corner of the building, the downspout is completely detached and the leader head is filled with a bird nest. The collection basin leading to the storm drain is broken and non-functioning. All of these conditions, in combination with the fact that this elevation is shaded by the adjacent building, result in excessive moisture in this location. Note the interior walls adjacent to this area display some of the worst conditions.



Figure 31. This photograph, taken in the 1940s, shows the brick walls in a state of deterioration. Evidence of brick and mortar loss, as well as efflorescence, is visible.





Figures 32 and 33. Deterioration of this brick pier on wall 283-NW-3 has continued since the 1940s, particularly at the top. There appears to have been some brick replacement since the 1940s. (Historic photograph courtesy of LSM)



Figure 34. The existing floor is constructed of brick paving (B), a thick bed of cement mortar laid over metal mesh (M), a layer of plastic sheeting (P), a thick bed of fine sand (S). This construction is laid directly on top of packed clayey soil (in foreground). Note the dampness of the soil once this area was opened. All of the moisture in the soil is prevented from evaporating thr0ugh the brick floor by the plastic and is instead channeled to the brick walls.



Figure 35. These walls illustrate a typical pattern of condition: the bottom of the walls have minor efflorescence and brick damage, and have largely been repointed; the middle of the walls have moderate damage and more advanced efflorescence; and the tops of the walls have the most significant damage, loss of brick and mortar and salt formation. The photograph also shows the typically poor condition of the original interior partition walls parallel to Dumaine Street and walls adjacent top hearths.



Figure 36. Wall 282-NE-2 is regarded as one of the walls in the worst condition. This photograph shows the extent of salt damage as well as the location of the cores taken for investigation purposes.



Figure 37. On the exterior side of the wall depicted in *Figure 36* above, there is frequently standing water. This photograph was taken several days after a rain event. The drain at the center of the wet floor is completely clogged.



Figure 38. Throughout the interior visible moisture in the form of water droplets were observed mid-way up the wall. It is assumed that the droplets are caused by salts absorbing moisture form the air and falling back into solution (deliquescing).

4.2.2 Moisture Survey and Investigative Probes (Cores)

Moisture Survey
Initial testing results show that infrared thermography is capable of mapping the moisture content of brick walls by mapping the surface temperature of the test wall. In order to create a high resolution thermal image of the test wall, a series of infrared images was taken of each wall surface and scaled to show temperatures between 81° and 87° Fahrenheit. These images were then tiled over a high resolution digital photograph of the wall surface to create a single infrared image of each wall. The infrared image in Figure 1 shows surface temperatures of wall 281-NE-4 as well as the core locations where temperature and relative humidity sensors were installed inside the wall cavity. *Figure 25* shows the installed sensors in wall 281-NE-4 as well as the soil moisture sensor installed at the base of the wall.

The results of this survey show temperature patterns occurring on each of the five wall surfaces in room 281. Cooler areas are represented by violets and blues while warmer areas are indicated by yellows and reds. The temperatures represented in all of the images are scaled to between 81° and 87° Fahrenheit. Areas near the bottom of the walls where there is no color have surface temperatures below 81° Fahrenheit.

Initial sensor readings taken at the time of the thermographic survey on August 7, 2013 gives the following results: Sensor 1 @ 11" above the finished floor 74.95° F/ 99.8% RH; Sensor 2 @ 35" above the finished floor 75.92° F/ 99.8% RH; Sensor 3 @ 61" above the finished floor 76.78° F/ 67.8% RH. The temperatures measured on the interior of the wall are lower than those at the wall surface as indicated by the infrared image. However, the gradient of temperatures follows the same pattern of lower temperatures at the base of the wall with rising temperatures moving up the surface of the wall. Continued and consistent use of thermal imagery is necessary in order to detect changes in moisture content in wall 281-NE-4. Additional infrared images correlated to wall sensor data will allow for comparisons between wall sensor and infrared data over time and under changing conditions. Following future testing that shows a correlation between wall sensor and infrared data, the Louisiana State Museum can use this technique to determine the potential cases of moisture infiltration and also test proposed conservation interventions to slow salt crystallization and deterioration of the brick walls. (*Figure 39*)

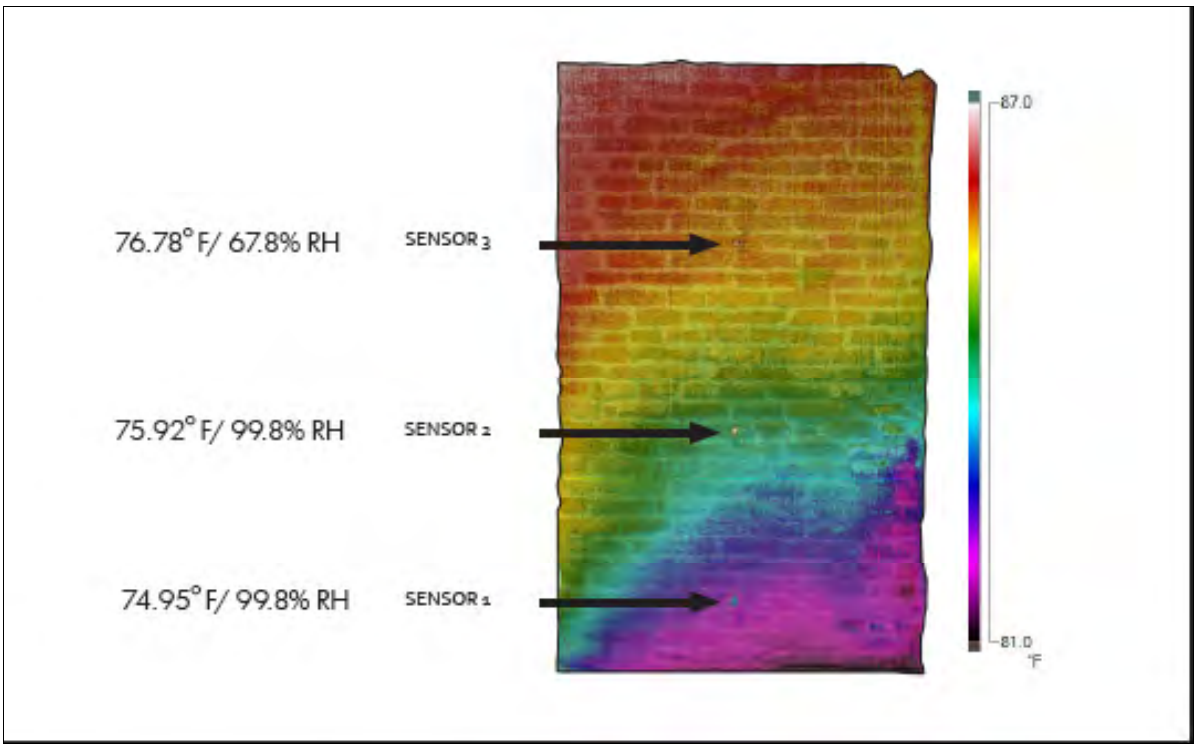


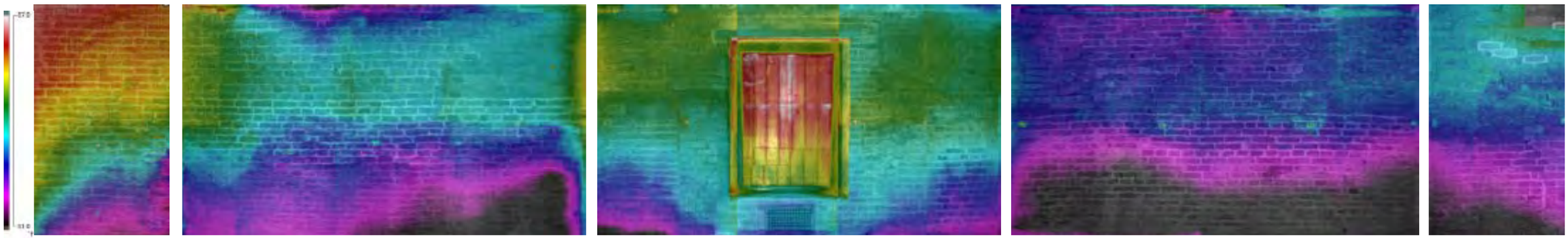
Figure 39. Infrared image of wall 281-NE-4 showing sensor locations with temperature and relative humidity values for each sensor on August 7, 2013. The core of the wall is cooler than the exterior surface, however, there appears to be a correlation between surface temperature and moisture content.

The following layouts depict surface temperatures on the five walls of room 281. All of the walls exhibit similar surface temperature patterns with the coolest portion of the wall surface being the base of each wall. The two long interior wall sections, 281-SE-1 and 281-NW-1, display the largest surface areas with temperatures below 81° F. Cooler temperatures are also found at the tops of these wall sections, possibly due to cool air falling from the climate controlled second level. The exterior wall in this room, wall section 281-SW-1, has on average a higher surface temperature than the rest of the room. This is due to external heating of the exterior wall surface which has moved by conduction through the wall cavity to the interior wall surface. The highest surface temperatures are found on the test wall section 281- NE-4. Continued monitoring of these wall sections using infrared thermography and sensor data will help to better understand the effect of the external environment on the location of moisture infiltration in the wall cavities under different environmental conditions.

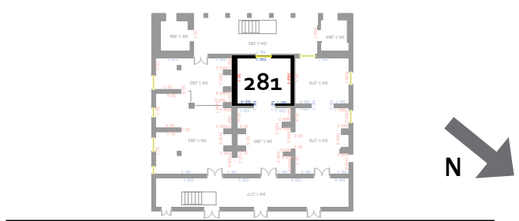
DIGITAL PHOTOGRAPHS



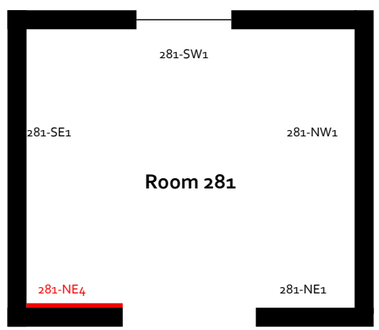
INFRARED IMAGE OVER PHOTOGRAPHS



281-NE4 | 281-SE1 | 281-SW1 | 281-NW1 | 281-NE1



FIRST FLOOR



Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 Dumaine Street, New Orleans, LA, 70116

room #

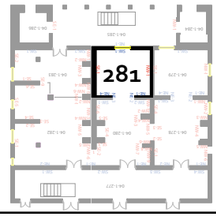
281

DIGITAL PHOTOGRAPH



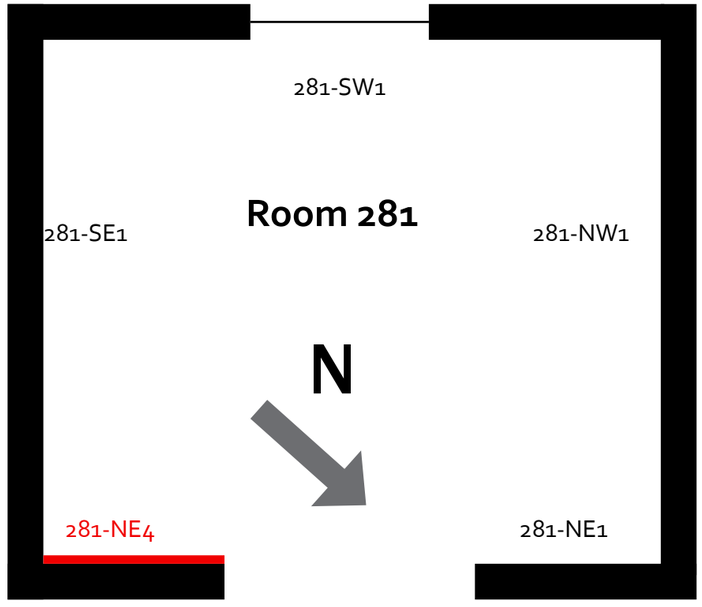
INFRARED IMAGE OVER PHOTOGRAPH





DUMAINE STREET

FIRST FLOOR



Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 DUMAINE STREET, NEW ORLEANS, LA, 70116

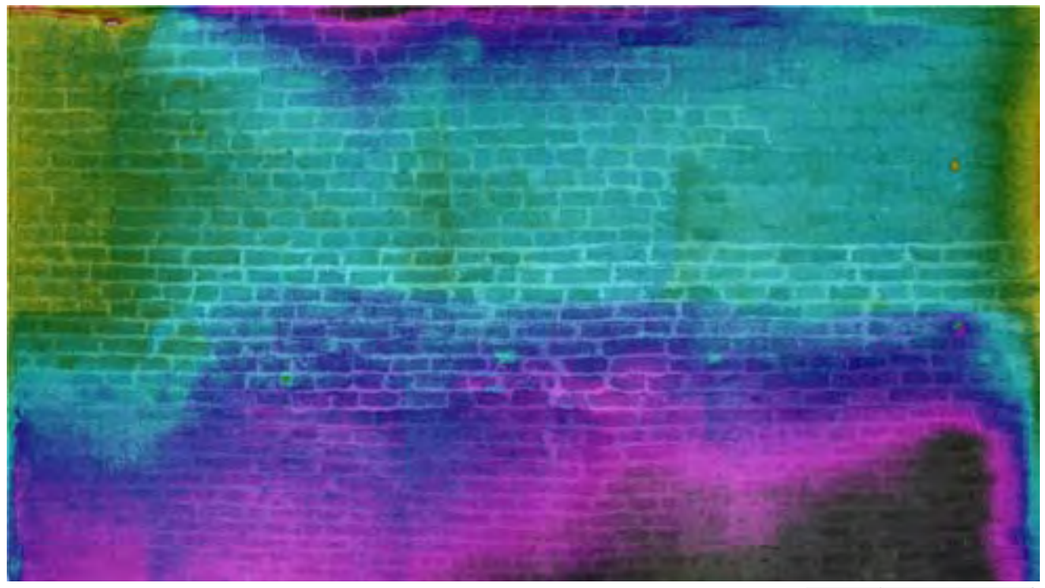
wall #

281-ne4



DIGITAL PHOTOGRAPH

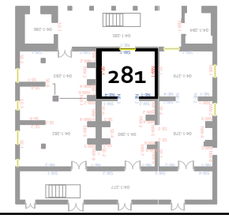
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INFRARED IMAGE OVER PHOTOGRAPH

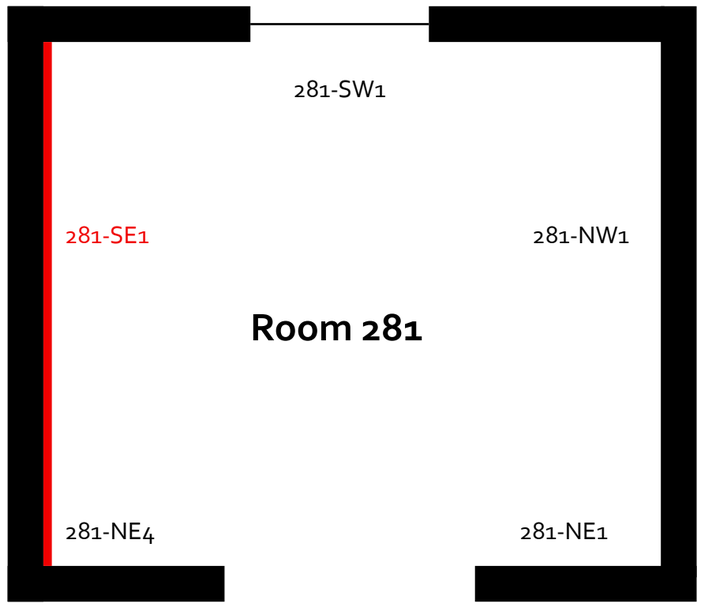
0′ 1′ 2′ 3′





DUMAINE STREET

FIRST FLOOR



N

Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 Dumaine Street, New Orleans, LA, 70116

wall #

281-se1



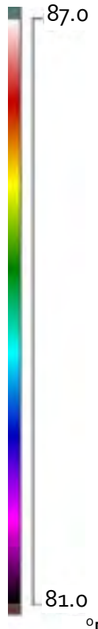
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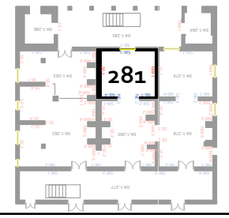
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INFRARED IMAGE OVER PHOTOGRAPH

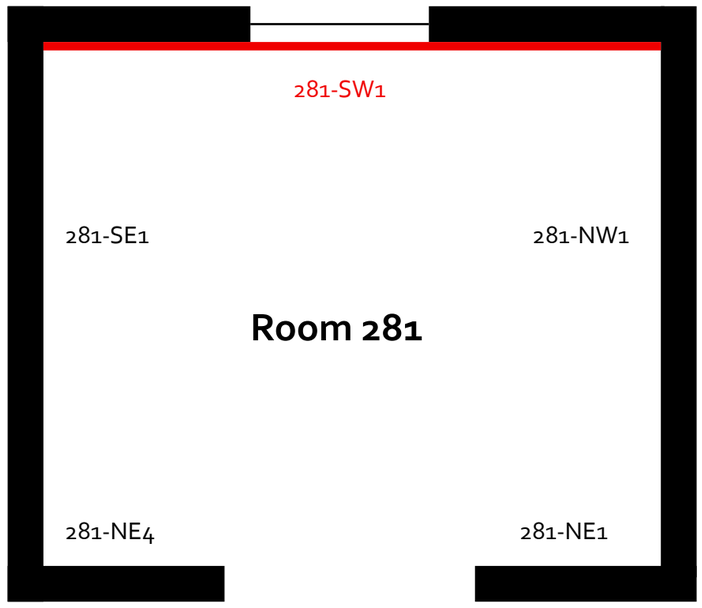
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DUMAINE STREET

FIRST FLOOR



Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 Dumaine Street, New Orleans, LA, 70116

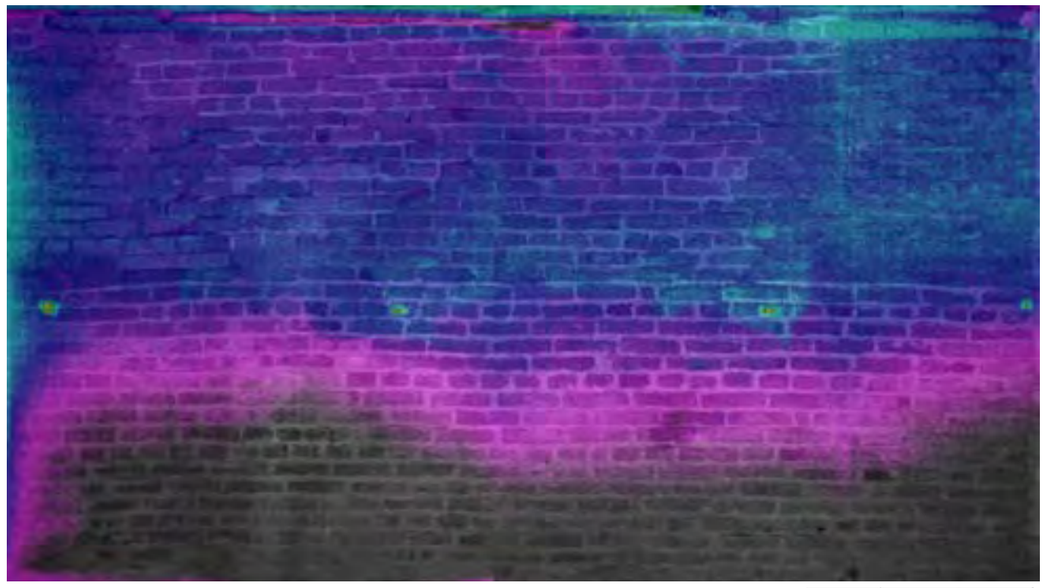
wall #

281-SW1



DIGITAL PHOTOGRAPH

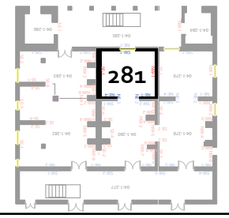
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INFRARED IMAGE OVER PHOTOGRAPH

0′ 1′ 2′ 3′





DUMAINE STREET

FIRST FLOOR



N

Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 Dumaine Street, New Orleans, LA, 70116

wall #

281-nw1

DIGITAL PHOTOGRAPH

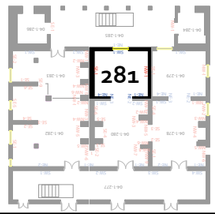


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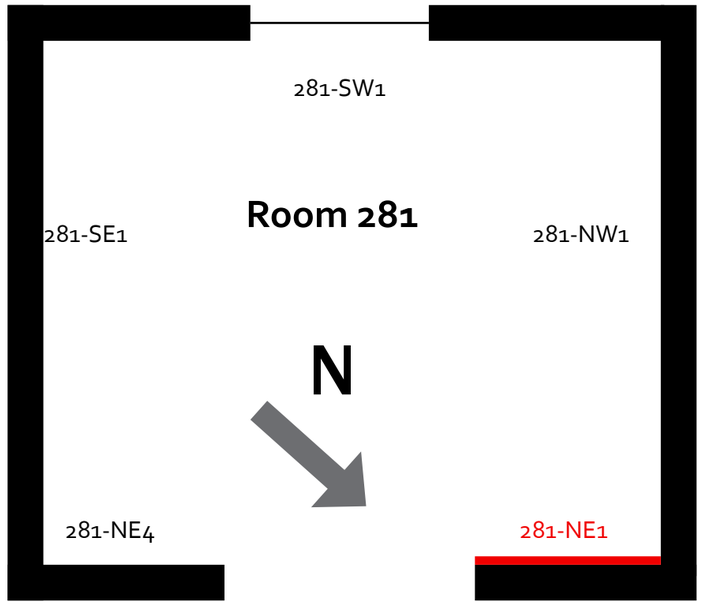


0′ 1′ 2′ 3′



DUMAINE STREET

FIRST FLOOR



Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 DUMAINE STREET, NEW ORLEANS, LA, 70116

wall #

281-ne1

Investigative Probes (Cores)

The six cores removed from walls 281-SE-1 and 282-NE-2 revealed useful information about the walls in the location of the cores. Because cores were taken at various heights, a profile of the wall's condition and construction could be created based the results of the cores. In addition, portions of some of the core samples were analyzed for salt content so this information could be factored into the data collected at each of the cores. The latter is discussed in detail in *Section 4.3.2* of this report.

For wall 281-SE-1, the core samples showed that this wall is constructed of three wythes of brick. As is typical throughout the ground floor of Madame John's Legacy, the bond pattern of this brick wall varies across the wall. The walls have been so heavily altered over time, the coursing and even the size and shape of the brick, is irregular throughout the entire ground floor. Therefore, one cannot easily characterize the brick construction of the ground floor according to bond pattern. A description of bond at each core location can be described, however. In the location of Core 1, the brick is laid in an English bond (with rows of headers approximately every seventh course of bricks). However, in the location of Cores 2 and 3, the brickwork is laid in a version of common bond (with rows of headers alternating with rows of stretchers). All cores were taken through a stretcher course. A section of the wall showing its construction, based on the findings of the cores, is included in *Figure 40.* In addition, photographs of each core sample can be seen in *Figures 7-9.*

For wall 282-NE-2, the core samples showed that this wall is constructed of four wythes of brick. This wall suffers from the same irregular coursing as wall 281-NE-2, although at the location of the cores, the wall is fairly consistently laid in a common bind pattern, with a row of headers occurring approximately every fourth course. All cores were taken through a stretcher course. A section of the wall showing its construction, based on the findings of the cores, is included in *Figure 41* and photographs of all cores can be seen in *Figures 10-12.*

One of the primary reasons for implementing the cores was to evaluate the condition of the center portion of the brick walls. When examined from the top, many walls appear to contain a significant amount of deteriorated brick and mortar at their center, which exists as a loose crumbly powder measuring as deep as 4-inches in some locations. (*Figure 42)* The cause of this extreme condition is not fully understood, but is assumed to relate to the warmer temperatures present in the upper portion of the walls throughout most of the ground floor, as well as the open (i.e. uncovered) tops of the walls. These two conditions promote drying of the masonry, which if it contains a significant amount of salts, would lead to deterioration. The concern was that the center of the entire wall might be deteriorated to the same extent as the top.

The coring of the walls revealed that the condition of the masonry in the six core locations is sound. Although the cores did fall apart upon extraction from the bit, which was expected, the brick and mortar was relatively intact and the mortar fairly well-bonded to the brick. The

powdered masonry condition at the top of the wall is still a concern, however. The fact that the masonry has deteriorated a significant amount at the tops of many of the walls could pose a concern for the structural members resting on the tops of these walls. Although a structural assessment was outside of the scope of this study, one should be performed in the near future to evaluate the structural integrity of the masonry walls (particularly those documented as being very deteriorated at the top centers). It is important that such an evaluation be performed by a structural engineer who specializing in historic buildings and has a knowledge of historic building materials.

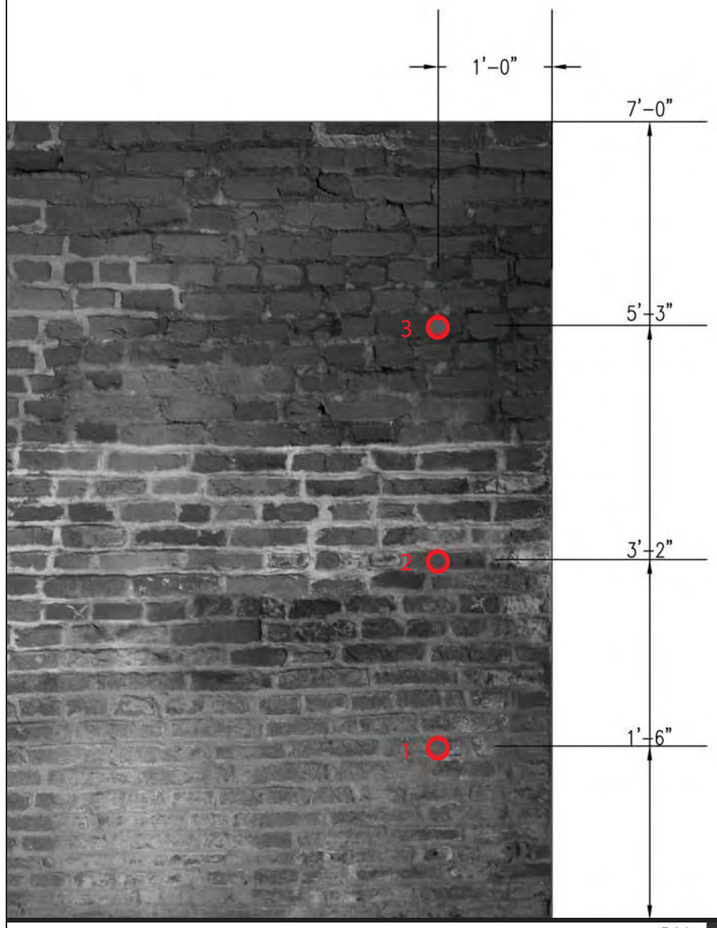
In all but one core location, the brick are laid with the original soil and lime-based mortar (as discussed in detail below in *Section 4.3.1*). This mortar was found throughout the center of the wall and also as bedding mortar for the brick at the outer wythes of the wall. It should be noted that, because the cores were taken through the center of the bricks, only the mortar from the interior of the wall was retrieved; the joints surrounding the cored bricks have all been re-pointed with modern mortar. (*Figure 44)*

The only location where a different (non-original) mortar was observed at the interior of the wall was the top core (Core 3) of wall 282-NE-2. In this location, which was documented as an area of re-pointing, the interior wythe of brick is laid with a white-colored mortar that is hard and dense and presumably made with Portland cement. Interestingly, the core removed below this (Core 2 of wall 282-NE-2) contains very little mortar evidence. Only the underside of the middle wither of brick has any mortar (the original soil-based mortar); there is little to no mortar between brick wythes in this location. It is possible that, if the wall was reconstructed at different points in time, mortar may not have been used to tie the new brick to the existing. It is also possible that the mortar has deteriorated in this location. However, if this were the case, one would expect to see evidence of powdered mortar.

As the cores were removed from the wall and laid out for documentation purposes, they began to dry. As they dried, salts were observed forming on their surface. In some instances, as with Core 3 of Wall 281-SE-1, brick broke apart in locations where there were pre-existing hairline fractures filled with salt in solution. As the solution evaporated and the salt crystals formed, the pressure placed on the walls of the fracture, forced the brick apart. (*Figures 43 and 45)* This action mirrors the phenomenon that is occurring throughout the brick masonry of the ground floor of Madame John's Legacy, albeit it on a smaller scale. It also makes one think about what might happen if the masonry is dried out on a large scale, and the damage that might ensue as the result of such an action. The presence of salts in the brick masonry is discussed in greater detail in *Sections 4.2.1* and *4.3.2*.

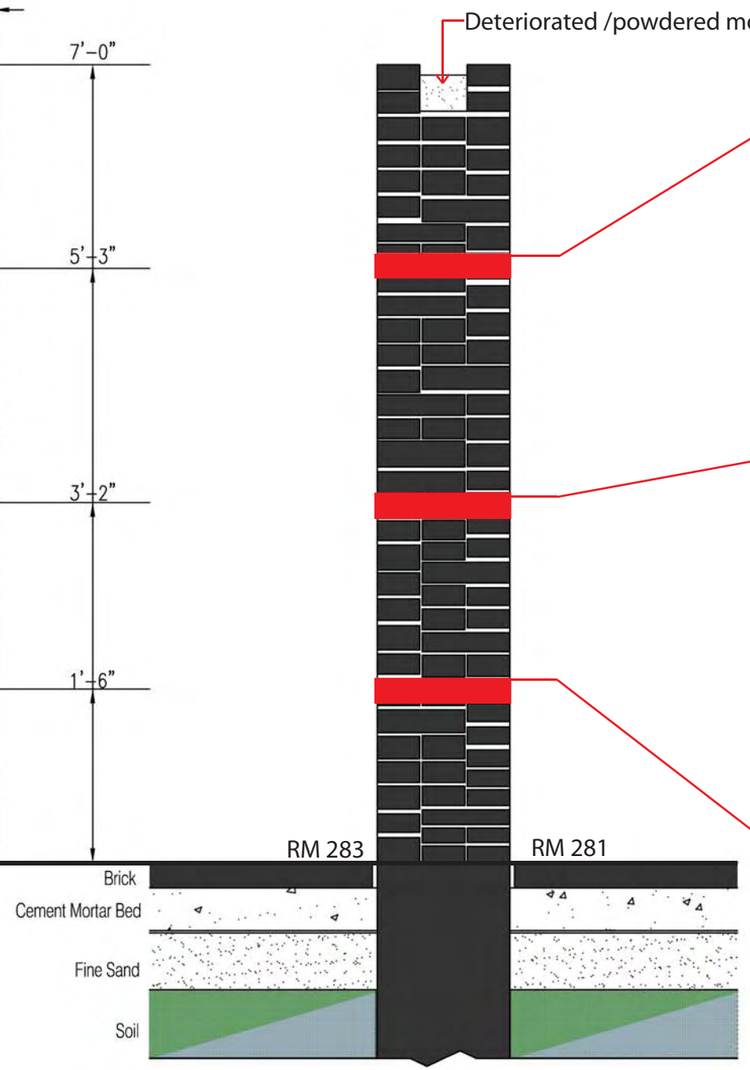
Room 281 SE1 and Room 283 NW1

Figure 40

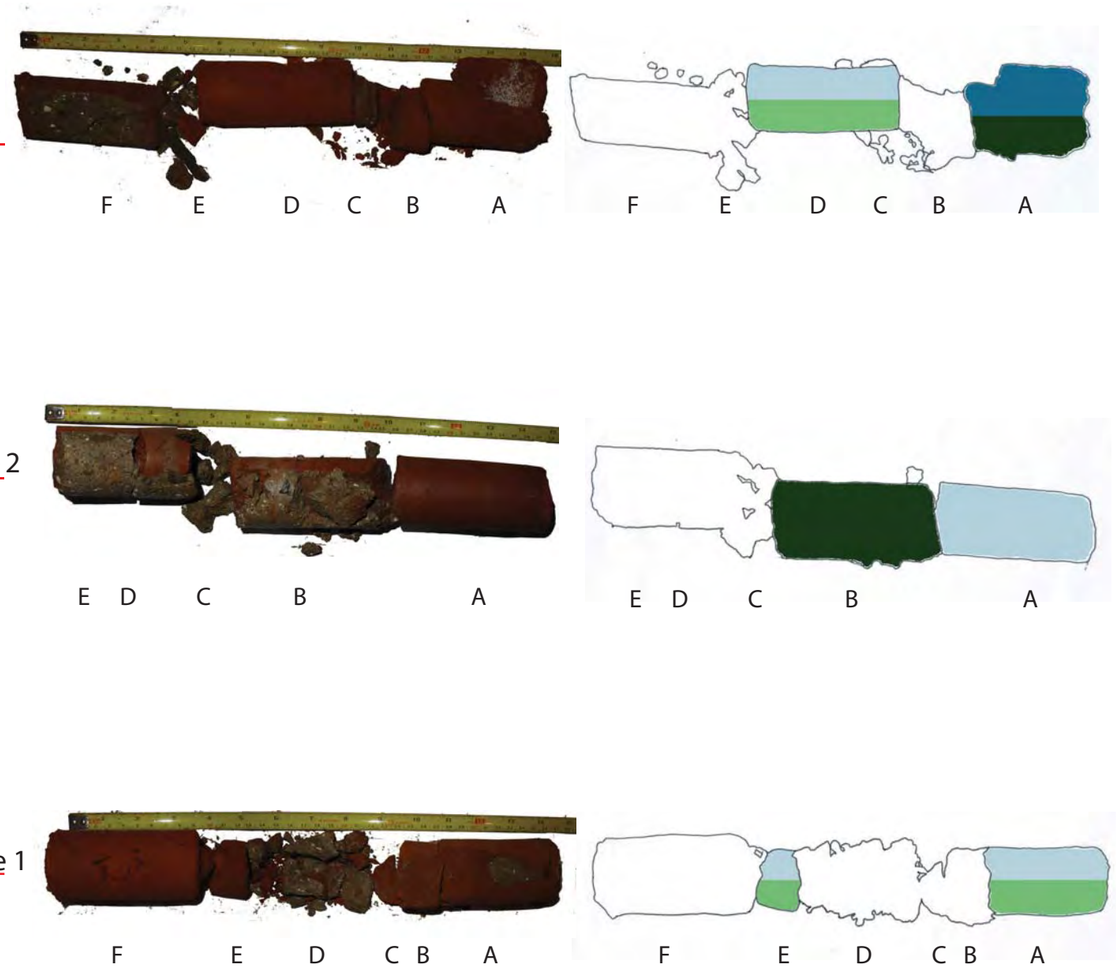


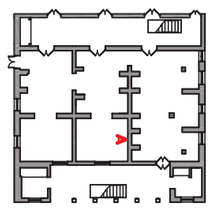
RM 281 SW1

Location of Cores in Wall Elevation



Location of Cores in Wall Section







KEY TO SALT TYPES AND CONCENTRATIONS

= Chloride (NaCl) concentration, Weak (< 0.50 %) to Heavy (> 3.0 % and < 6.0 %)

= Nitrate (NaNO3, KNO3) concentration, Weak (< 0.50 %) to Heavy (> 3.0 % and < 6.0 %)

Note: The 2007-08 study performed by the Getty Conservation Institute also found sulfates (sodium sulfate and gypsum) in the ground floor brick masonry (see Appendix H). While the current study did not detect sulfates in the samples analyzed, they are likely present in the masonry.

Date	
Drawn by	

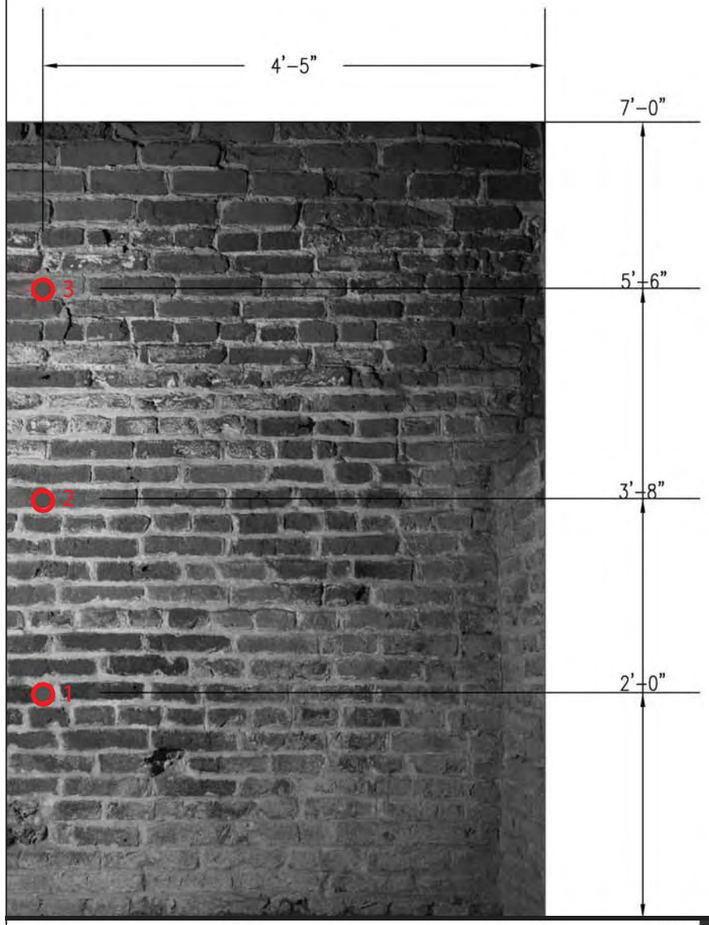
Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Investigative Probe (Cores) and Salt Content at Core Locations

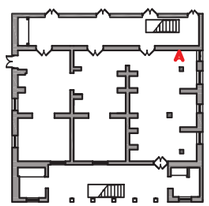
Room 282 NE2 and Room 277 SW1

Figure 41

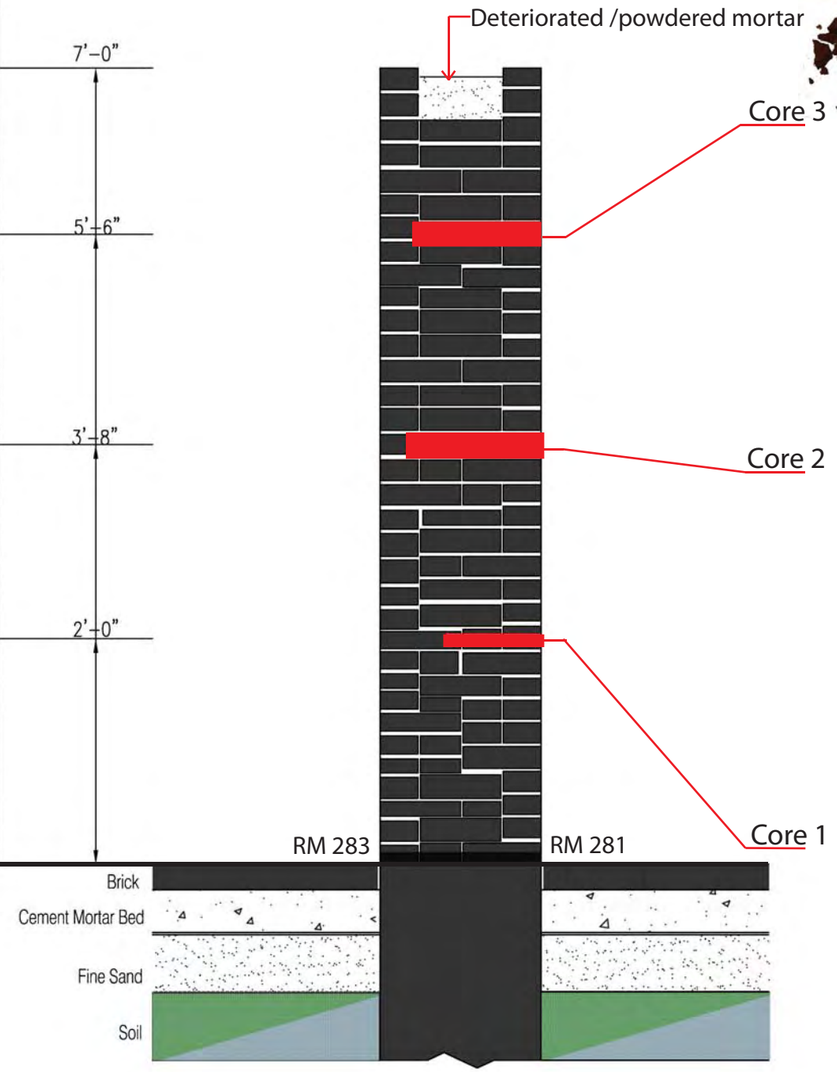


RM 281 SW1

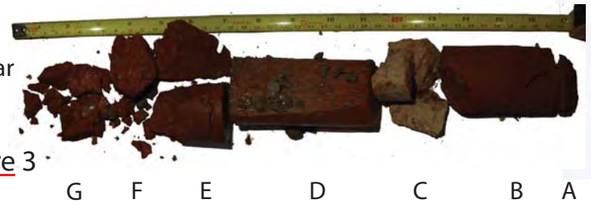
Location of Cores in Wall Elevation

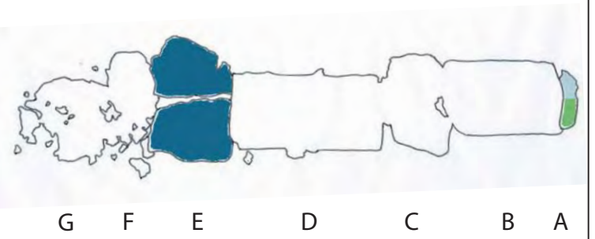




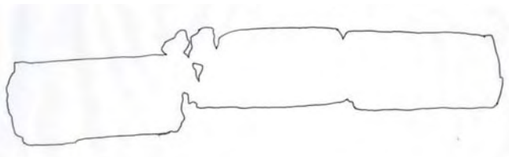


Location of Cores in Wall Section













KEY TO SALT TYPES AND CONCENTRATIONS

= Chloride (NaCl) concentration, Weak (< 0.50 %) to Heavy (> 3.0 % and < 6.0 %)

= Nitrate (NaNO3, KNO3) concentration, Weak (< 0.50 %) to Heavy (> 3.0 % and < 6.0 %)

Note: The 2007-08 study performed by the Getty Conservation Institute also found sulfates (sodium sulfate and gypsum) in the ground floor brick masonry (see Appendix H). While the current study did not detect sulfates in the samples analyzed, they are likely present in the masonry.

Date	
Drawn by	

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Investigative Probe (Cores) and Salt Content at Core Locations

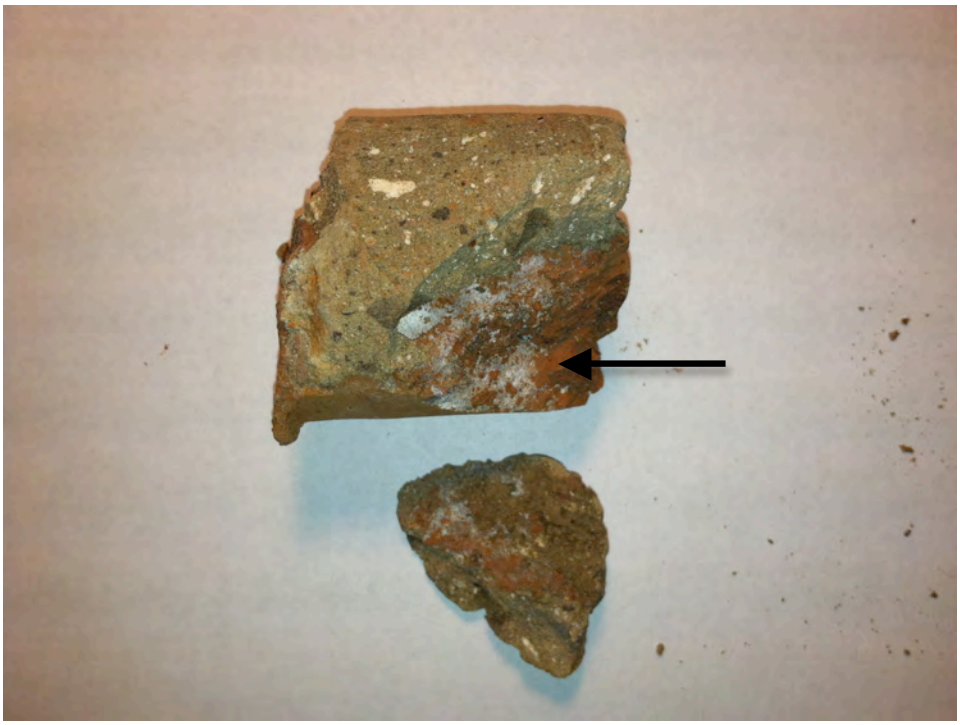


Figure 42. The top of wall 281-SE-1. Note the lack of masonry at the center, and the presence of powdered, deteriorated mortar. In some areas, this deteriorated mortar and brick extended 4 to 5 inches down into the core of the wall.



Figure 43. The brick from the outer wythe of Wall 281-SE-1 removed as Core 3, fractured as the core sample dried out, revealing a pre-existing fracture laden with salt. The salts crystallized as the brick dried, forcing the brick apart.





Figures 44 and 45. (Top) In the core removed from the middle of the wall between Rooms 281 and 283 (Core 2), the original soil-based mortar is visible at the underside of the brick closest to Room 283. The mortar is intact and well-bonded to the brick. (Bottom) However, as portion "E" of the sample dried, some of the mortar broke away from the brick, revealing salts that had formed at the interface between the mortar and the brick.

4.2.3 Archaeological Investigation

Previous Archaeological Investigations at Madame John's Legacy

In 1971, Madame John's Legacy (16OR51) was one of the first historic period sites in urban New Orleans to be systematically investigated, when the subdiscipline of historical archaeology was still in its relative infancy. These investigations, carried out by Richard Shenkel of the University of New Orleans, were primarily intended "to solve limited objectives particular to the structural detail and chronological development of the house"[18], particularly pertaining to the relationship of the existing structure and an earlier one, presumably at least partially destroyed in the 1788 fire. At least 9 units of various sizes were excavated to this end, and 3 of them (Units 7, 5, and 9), located alongside existing foundations of the main house, are of particular relevance to the present investigations. Two others were located alongside the brick columns separating the loggia of the house from the rear courtyard and will be given somewhat less attention here. Overall, the units documented highly variable stratigraphy throughout the area, with evidence of multiple resurfacings of courtyards and brick floors, and 2.5 to 3.5 ft[19] of cultural strata accumulated over the sterile clay subsoil matrix.

True north at the site is located roughly diagonally to the city street grid within the Vieux Carre, but, in keeping with the conventions of Dawdy's 1998 work at the site, from the main house towards Dumaine Street is treated as grid north throughout the subsequent discussion. Unit 7 was apparently located so as to span the doorways linking what had been designated Room 1 (the present foyer at the street frontage), and Rooms 2 and 3, the eastern and central front chambers[20]. At its maximum extent, Unit 7 measured 10 ft east/west and 7 ft north/south, though an irregular portion of this area was not excavated. A number of subsurface features were encountered in this unit, including the remains of a wooden drainage system just beneath the brick floor. The soils encountered during excavations were typically characterized as a mixture of fills containing crumbled brick, architectural debris, oyster shell, often mixed with soil characterized as "a very sticky gumbo".[21]

According to the profile drawings on file with UNO, the foundation of the front wall (separating the Room 1 'foyer' from Rooms 2 and 3) extends to a depth of 2.4' from the existing grade, with 8 subsurface courses of brick laid in a slightly irregular running bond. The footing is not pyramidal, but instead steps outwards only once at 1.3 ft below ground surface. Also at about 1.3 ft below

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[18] Shenkel, 1.
[19] All measurements in the 1971 excavations are listed in English units, and I have not converted them here because of some possible inconsistencies in use of decimal notations in the original.
[20] Note that there is some discrepancy between the reconstructed site map (as depicted in Dawdy 1998:19) and an existing map on file at UNO. As the profile drawings are more consistent with the latter referenced map (which is assumed to have been drawn by Shenkel in 1971), this one is assumed to be more accurate here.
[21] Shenkel, 49.

grade, continuous door sills were located in the entryways between both Rooms 1 and 2 and Rooms 2 and 3. This was interpreted as the ground surface at the time the main structure was rebuilt in 1788, with the intervening 1.3 ft representing leveling and accumulations of debris over the course of the nineteenth and twentieth centuries. This interpretation was further supported by the presence of a carbon-stained layer (presumably representing the fire itself) and soils with earlier eighteenth-century artifacts beneath this level.

Unit 5, measuring 3.5 ft north/south by 5 ft east/west, was described as having been located in the interior northwestern-most corner of the covered portion of the rear loggia. The unit was bounded on two sides by walls and has since been enclosed as a separate room. It contained numerous examples of resurfacings of the covered portion of the brick courtyard, although an occasional paucity of diagnostic artifacts separating them made precise dating difficult. These soils had accumulated to a depth of just over 3 ft. The brick foundations of the main house were very similar to those noted in Unit 7, with the footing expanding only one course, presumably around the level of what had been the 1788 ground surface. The grid west wall of the loggia abutted the main house wall but was not directly joined into it. Its deepest course stepped out once more, and both foundations rested on a bed of oyster shell.

Unit 9 was located in the exterior alleyway on the grid west side of the main house. It was a trench measuring 7 ft north/south by 4 ft east/west. The exterior side of the main house wall foundation was identical in structure to that noted during excavations on the interior, with a single step outwards at just over 1 ft below grade. The gap between the loggia extension and the main house was also noted here, with it being concluded that the loggia wall was later in construction. The most interesting feature of the unit from an archaeological standpoint was a plank located at a depth of 2.3 ft running perpendicular to the main house wall. It was posited that it was the remains of the earlier Colonial period structure on the lot. Unfortunately, the profile and plan drawings associated with Unit 9 have not been located.

Two additional units, designated Units 4 and 6, are of some interest here. These units were located among the central loggia columns at the rear of the main house and were somewhat shallower than the interior units. The pillars or columns of the loggia appeared to originate in one of the later courtyard resurfacings (at a depth of less than 1 ft), and the majority of the material associated with them dates from the nineteenth century.

Further archaeological work was undertaken more recently by Shannon Dawdy under the auspices of the Greater New Orleans Archaeological Program.[22] These investigations were focused entirely upon areas to the exterior of the primary structure and were planned to mitigate impacts to

[22] Dawdy 1998, cf. Dawdy *Building the Devil's Empire: French Colonial New Orleans.* University of Chicago Press, Chicago and London (2008).

archaeological resources in the rear courtyard associated with installation of a new air conditioning system. This work was planned in part for compliance with Louisiana's *Archaeological Resources Act (R.S. 41:1606),* which mandates that significant archaeological remains on state-owned property be considered during work that might negatively impact them. While the research plan considered the possibility of shifting some excavations to the interior of the main structure, this course of action was abandoned, as it would have required disturbance of the brick floor beneath it.

Dawdy's excavations, totaling six square meters of horizontal area, documented a complex stratigraphic sequence, with numerous artifact-rich midden deposits, features (mainly related to resurfacings of the patio/courtyard area), and a trash pit seemingly related to the 1788 fire that damaged the Colonial period structure on the lot. While the results of the excavations are not directly pertinent to the goals of the present research (other than to emphasize the variability in strata at the site), the research issues defined in the work are very significant. From a methodological standpoint, Dawdy's work indicated that the use of a 5 cm vertical level, at least within intact early (Colonial-era) deposits, had the potential to yield more refined chronological information than the more traditional 10 cm level. More importantly, it provided important data on consumption and the use of space in the Colonial period, which could be used in conjunction with a detailed reading of historical documents to examine the formation of a 'Creole' identity in the eighteenth century.

Current Field Investigations

Unit A Excavations**.** Unit A was a 1 x 1 m unit located along the interior of the rear wall of the grid southwest corner chamber of the ground floor area. The unit was located approximately 1 m from the west wall of Madame John's Legacy and was oriented on the same axis as the building, using the south wall of the building as the southern boundary of the unit. This unit was positioned in this area for a variety of reasons. In a previous renovation, plumbing or duct work had been installed to serve restrooms located beneath the upper floor *cabinets* just on the other side of this wall. The unit would serve to assess differential effects on the foundation that might be due to this infrastructure, in keeping with the overall goals of the larger conservation project. In terms of archaeological goals, historical and cartographic research had suggested that the earlier construction on this portion of the block would more likely be located towards the west side of the block. Furthermore, in the excavations by Shenkel on the building's exterior (to the southwest of Unit A), wooden timbers apparently dating to the French Colonial period had been located in this vicinity. Finally, it was generally suspected that there would be a greater likelihood of encountering artifact-rich deposits further back from the Dumaine street frontage.

Unit excavation was initially hindered by the herringbone-patterned brick floor in the interior of the building (*Figure 46*). This brick floor had been constructed as part of a series of renovations in the 1990s. The initial plan was to remove the brick in an area about 120 cm square, labeling each

brick using chalk as it was removed so that it could be replaced precisely in the original pattern. This proved to be difficult in itself, as the brick had been laid into a wet cement bed, and varying amounts of cement had overlapped the bottom edges and filled in the spaces between brick. A geological pick, chisel, and hammer had to be used to create space and break the seal of each brick with the cement bed beneath it. After the brick was removed, the cement bed beneath the floor proved to be quite substantial, and hand tools were inadequate to break through the surface. In consultation with the Tulane Preservation Studies team and Louisiana State Museum (LSM) personnel, it was determined to use a jackhammer operated by LSM employees to penetrate the slab, while additional museum staff monitored vibrations in the upper level of the building. The jackhammer was effective in initially breaking up the slab, with the remainder of the debris from the slab being broken up with hammers and picks to outline the unit. However, because of concerns about the impacts of vibration, it was elected to use an alternative technique to break through the slab in the other units (as described below).

The cement slab was somewhat thicker alongside the wall and thinned towards the center of the room, varying from 5 to 10 cm (1.97 to 3.94 in) in overall thickness. It had been poured onto a wire mesh frame at a depth of 25 cmbd (or 9.84 inbd, see Figure 3). This, in turn, overlay a layer of thin plastic sheeting forming a moisture barrier, which extended all the way to the edge of the south building wall at a depth of 29 cmbd (11.42 inbd). The intervening spaces had been filled with a layer of loose, powdery mortar. Beneath the plastic, a layer of fine pale yellow (2.5Y 8/3) sand fill from 10 to 15 cm (3.94 to 5.91 in) in thickness was used to form a level surface for the moisture barrier, cement slab, and brickwork. These layers were designated Contexts 1-6 (see *Table 2*). All had been installed as part of a single effort to level and improve the interior floor. As will be discussed in *Section 5.2* of this report, rather than these layers being used to raise the floor level, they had replaced nearly 30 cm (11.81 in) of historic strata (including nineteenth-century floors and midden deposits) previously documented by Shenkel. Because of the patterning of the brick and the effort required to get through these levels, the final location of the unit was at 0.9 m (2.95 ft) from the west wall of the structure, so that it spanned the 0.9 m to 1.9 m (2.95 to 6.23 ft) area of the interior from west to east. A unit datum was established along the wall at the southeast corner of the unit at 10 cm (3.94 in) above existing ground surface (i.e. the contemporary brick floor).

The first historic stratum encountered was designated Context 7. It occurred beneath the Context 6 sand fill and formed an irregular surface anywhere from 32 to 42 cmbd (12.60 to 16.54 inbd). Context 7 is a dark grayish brown (2.5Y 4/2) silty clay fill mottled with occasional olive brown (2.5Y 4/3) loamy patches. These loamy patches increased by depth. Context 7 was excavated in 4 5 cm levels, with the first two levels used to bring the unit down to a uniform depth of 42 cmbd (16.54 inb), and the remaining two exposing the next excavation context. When Context 7 was initially exposed, a series of small rectangular depressions were noted in the northeast quadrant of the unit, most about 5 cm (1.97 in) long and 3 cm (1.18 in) wide. These represented points at which the jackhammer had penetrated too deeply and made impressions into the new soil; however, in no

place had the jackhammer penetrated through the context. Context 7 was sparse in cultural material, with occasional artifacts suggesting an early to mid-nineteenth century date for the fill episode represented by it. Artifacts collected included small fragments of ceramic, including brown transfer-printed pearlware, olive glass, animal bone, nails, a shell button, and small quantities of brick rubble, mortar, and slate. At 47 cmbd (18.5 inbd), an increase in brick rubble was noted, and an alignment of larger brick fragments running north/south near the center of the unit was mapped in place. In addition, the brick wall of Madame John's (referred to as Context 16) stepped out slightly at 47 cmbd (18.5 inbd), forming an approximately 3 cm (1.18 in) lip within the unit.

Context Number	Provenience	Description	Depth	Association
1	Entire Ground Floor Interior	Herringbone Pattern Brick Floor	10-15 cmbd	1990s Renovation
2	Entire Ground Floor Interior	Hard Cement Bed for Brick Floor	15-25 cmbd	1990s Renovation
3	All Units	Soft Powdery Mortar/Cement	20-25 cmbd	1990s Renovation
4	All Units	Thin Wire Mesh Bedding for Cement	24 cmbd	1990s Renovation
5	All Units	Plastic Sheeting Moisture Barrier	26 cmbd	1990s Renovation
6	All Units	Clean Sand Fill	26-37 cmbd	1990s Renovation
7	Unit A	Silty Clay Fill	35-50 cmbd	ca. 1820-1850
8	Unit A	Olive-Toned Silty Loam Midden	50-52 cmbd	ca. 1800-1820
9	Unit A	Artifact Concentration Associated with Top of Context 10	52 cmbd	ca. 1800-1820
10	Unit A	Compact Crumbled Brick, Mortar, and Shell (Floor Surface)	49-53 cmbd	ca. 1788-1789 interior resurfacing
12	Unit A	Burned Debris Concentration (Possible Pit)	49-60 cmbd	1788 fire debris
13	Unit A	Heat-Altered Debris in Silt Loam Matrix	55-60 cmbd	1788 fire debris
16	Unit A	Subsurface Foundation of MJL Primary Structure Rear Wall	N/A	ca. 1730 original striucture
17	Unit A	Dense Burned Debris	60-66 cmbd	post 1788 fire debris
18	Unit A	Ash Lens	66-68 cmbd	1788 fire
20	Unit A	Silty Clay to Loamy Clay Midden	68-75 cmbd	ca. 1720-1760
23	Unit A	Crushed/Crumbled Brick Surface	75-80 cmbd	1725 construction on lot?
24	Unit A	Wooden Plank Extending Under Ctx 16	80-85 cmbd	1725 construction on lot?
27	Unit A	Clay/Silty Clay Subsoil	80-90 cmbd	N/A

Table 2. Contexts identified in Unit A.



Figure 46. Herringbone patterned brick floor in Unit A area, facing west.



Figure 47. Framework for cement slab (Contexts 3, 4, and 5), facing west.



Figure 48. Context 10 in Unit A, a compact mortar and crushed brick surface, facing west. Context 12 is the darker area in the upper left (southwest) corner of the unit.

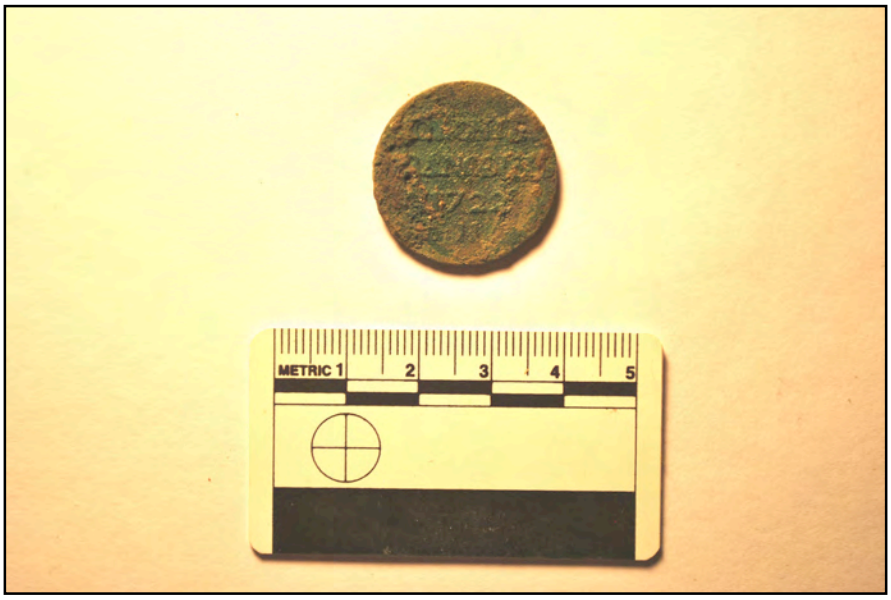


Figure 49. 1722 "COLONIES FRANCAISE" 9 denier coin, with mint mark from La Rochelle, France.

At 52 cmbd (20.47 inbd), the soil became distinctly more silty in texture, with an increase in organic content and in artifacts, and with a clear separation visible from the clayey Context 7 matrix. Designated Context 9, the remnant olive brown (2.5Y 4/3) silty loam midden with some charcoal staining corresponded closely to the top of a new course of brick in the south wall. Artifacts were most concentrated to the north of the brick alignment noted in the previous level, which now seemed to form a slight L-shape to the west. This brick alignment was designated Context 8, but it was found to only consist of a single course of bricks with no evidence of any joining of those bricks with mortar. Based on the artifacts in Context 9, including creamware and pearlware, Context 9 likely represents the ground surface within Madame John's at the beginning of the nineteenth century. In this regard, the Context 8 bricks appear to be incidental, simply representing an accumulation of debris rather than a structural feature. Some possible wood staining was noted to the east of the brick alignment, apparently the remnant of a later decomposed stake originating in the Context 7 layer.

Context 9 was found to consist of only a thin (typically no more than 2 cm or 0.79 in thick) accumulation of organic debris on top of a compact surface of crushed brick, mortar, and burned rangia shell. This surface, presumably representing a prepared floor dating to the 1788-1789 rebuilding of Madame John's, was called Context 10 (*Figure 48*). It was found throughout the unit at a depth of 53 cmbd (20.87 inbd), with the exception of a small irregular area in the southwest quadrant of the unit and along its south wall (i.e. along the Context 16 brick wall foundation). This area contained larger quantities of loose burned ceramics, particularly fragments of Spanish olive jars, and brick rubble, and was designated Context 12, a possible pit. Context 12 was subsequently removed in 2 5 cm levels. However, the boundaries of Context 12 were never very clear, and the artifacts associated with it do not appear to be qualitatively different than those from Context 13. These contexts are discussed together below.

Context 10 itself is no more than 4 cm (1.57 in) in thickness. It consists predominantly of burned shell, mortar, and brick fragments, in a compact very dark grayish brown (10YR 3/2) sandy loam matrix. Artifact content increased considerably at this level, with large quantities of fragments of eighteenth century ceramic types originating in this level, including burned creamware and tin-enameled ware, Spanish olive jars, and Rhenish stoneware. The most unique artifact find in this layer was a copper coin. Although one side was too badly corroded to be read, the obverse was embossed with the words "COLONIES FRANCAISES" and the date "1722" over a small mint mark indicating that it was minted in La Rochelle, France (*Figure 49*). This coin has been described as the "first 'American' copper" coin; it was minted specifically for circulation in the French colonies and was sent to Canada. Apparently, it was unpopular and never extensively used there, but it took on

a new life in French Louisiana, where hard currency was often in short supply.[23] Its occurrence in a context dating from just after 1788 demonstrates just how long these coins remained in circulation[24]. Also noteworthy was a fragment of a cuprous parasol or umbrella arm.

After the removal of the Context 10 surface, significant quantities of loosely consolidated burned material and brick rubble were noted throughout the new level. This material extends from 53 to 63 cmbd (20.87 to 24.8 inbd). As noted above, two separate context designations were assigned for this area: Context 12 refers to an area in the southwest corner of the unit and extending into the west wall in which there was very little actual soil whatsoever in the matrix. The level was predominantly comprised of fragments of olive jar and brick with charcoal and mortar flecks, in a loose dark olive brown (2.5Y 3/3) silty loam matrix. This loose, artifact-rich zone was surrounded by a somewhat more compact dark grayish brown (2.5Y 4/2) silty loam with occasional moist clayey areas. Its artifact content was very similar to that of Context 12, with olive jar and Rhenish stoneware fragments, burned creamware and faience, heat-altered glass, hand-wrought nails, and infrequent bone fragments. Other notable artifacts included a brass lock escutcheon and a bone button. A high concentration of burned shell and mortar, along with some fragmentary brick, also comprised the layer. It is possible that the Context 12 area actually represents the original location of a complete olive jar, stored on the pre-1788 ground floor of the building on the lot. When it burned, it would have collapsed and shattered, and the numerous olive jar fragments surrounding this loosely grouped core would represent that shattering.

At 63 cmbd (24.8 inbd), an increase in size of brick rubble was noted throughout the level, although the basic soil matrix remained virtually identical to that of Context 13 (i.e. a dark grayish brown silt loam). Context 17 was assigned to reference the full level containing this lens of large rick rubble and continuing burned ceramic vessel fragments (*Figure 50*). Immediately beneath this lens of brick and cultural debris was a well-defined lens of ash and charcoal extending throughout the unit at a depth of approximately 67 cmbd (26.38 inbd). All of the brick from Context 17 clearly rested on top of this organic lens (or Context 18), with no additional courses extending beneath it. Context 17 (and the second level of Context 13 above it), while appearing dry during excavation, became considerably more mucky when exposed and aerated during the screening process. This necessitated many small fragments from the levels being collected in bulk for later water screening. Context 18 is a black (10YR 2/1) loam (*Figure 51*). The Context 18 deposit was removed as a single sample for flotation, as it consisted of a thin lens of no more than 2-3 cm (0.79-1.18 in) of ash and debris. It occurs at the level of the lowest course of brick from the Context 16 wall.

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[23] John Kraljevich. First 'American' Coppers. *Coin World Magazine,* article published October 22, 2012 at http://www.coinworld.com/Articles/ViewArticle/first-american-coppers. Accessed August 2013.
[24] A more extensive discussion of the archaeological distribution and significance of the 9-denier "COLONIES FRANCAISES" coin will be provided in the draft report of investigations.

Context 20 represented a Colonial-era ground surface and midden accumulation extending beneath the extant wall of Madame John's Legacy. Just beneath Context 18, at 68 cmbd (26.77 inbd), Context 20 was described as a very dark grayish brown (2.5Y 3/2) clay loam with large quantities of crushed rangia shell and mortar, plus occasional brick fragments and large oyster fragments. Also noted were pockets of sandier soil throughout, along with a variety of cultural material, particularly tin-enameled wares, small bits of bone, much of it fish and bird, thin shards of olive glass and colorless glass tableware, straight pins, and at least one fragment of aboriginal pottery, an undecorated shell-tempered sherd comparable to the Mississippi Period *Bell plain* type. Context 20 was excavated in 3 levels of 5 cm each, with the last level representing a rapid transition to subsoil. The soil gradually shifted to a more markedly very dark gray (10YR 3/1) silty clay in color and texture, though occasional pockets of the more midden-like olive-toned soil (varying from 2.5Y 4/4 to 3/3 in color) continued to 85 cmbd (33.46 inbd). The artifacts in each of the two additional levels of Context 20 were comparable to those in the first, with a pipe stem fragment, a polished turtle shell disk, and a bone spur from a rooster also noted. A scatter of apparent turkey bones was also noted in the central portion of the unit at about 73-75 cmbd (28.74-29.53 inbd). These were located alongside a concentration of mortar and oyster shell at the north edge of the unit, but none of the bones appeared to be articulated.

At 78 cmbd (30.71 inbd), a number of possible features were noted, although, given the small area exposed, it is difficult to say with certainty what these features represent. Already at 73 cmbd (28.74 inbd), a number of circular and semi-circular hollow areas had been noted, most concentrated in an area in the northwest quadrant of the unit. Although such hollows in deeply buried clayey soils are not uncommon in New Orleans, where they are typically due to bioturbation (e.g. decomposed roots, rodent and crawfish burrows, and so on), they can also represent the locations of historic posts. Further suggesting this was that, by 78 cmbd (30.71 inbd), these hollow areas seemed to follow the edge of a brick concentration covering most of the eastern half of the unit. In addition, at 76.5 cmbd (30.12 inbd), a decomposed wooden plank was noted extending to the south, beneath the present brick foundation. This wooden feature angled downwards slightly from east to west and was 25 cm (9.84 in) wide, but only about 4 cm (1.57 in) in thickness. Another rubble concentration occurred paralleling the western wall of the unit. The plank was labeled as Context 24 but was otherwise left in situ.



Figure 50. Context 17, the debris layer from 1788 fire, facing west.



Figure 51. Context 18, ash and charcoal layer from 1788 fire, facing west.

This arrangement of features seemed consistent with the construction of a French Colonial post-in-ground or post-on-sill structure (*Figure 52*). It was hoped that the excavation of the area between 78 and 83 cmbd (28.74 and 32.68 inbd) would help to clarify the nature of this grouping. Context 20, Level 3, was limited to the trench-like area between the two concentrations of brick rubble noted above, but the soil in this area rapidly made a transition to the dark gray (10YR 4/1) silty clay matrix that is more characteristic of subsoils in New Orleans. Some larger bone fragments were noted in this area, but there were no structural remains indicative of posts and/or a construction trench. While some brick and bousillage was noted, it did not occur in a concentration that would indicate the presence of a structure. In addition, none of the possible posts maintained the consistent shape or orientation that would be suspected in they were cultural in origin.

The concentration of brick at this level was given a new context number (Context 23) and was excavated separately. It was associated with few artifacts, and it appeared to rest directly in the dark gray silty clay representing the transition to subsoil. After the removal of the brick, an additional level of clay subsoil was removed in selected areas of the unit, and a soil probe was used to examine stratigraphy at deeper levels. No further cultural deposits were identified, with the exception of occasional brick flecks, likely representing material trampled into subsoil and pushed deeper into the moist, unstable soil by natural processes. The subsoil, defined as Context 27, is a dark gray (10YR 4/1) clay/silty clay matrix with extensive reddish brown (5YR 5/4) oxidation staining.



Figure 52. Brick surface (Context 23) and wooden plank (Context 24) near base of Colonial-era level, facing west.

Unit B Excavations. The area selected for the excavation of Unit B was approximately 3 m (9.84 ft) from the west wall of the primary Madame John's structure, immediately adjacent to the interior of the front (Dumaine Street) wall. It was located on the east side of the street-facing opening that allows access to the northwest interior room, and it ended about 20 cm (7.87 in) short of the interior north/south wall that bounds this room. Shenkel's excavations had focused on the interior to the east of this point, and it was hoped that this unit's placement would allow for comparison with his previous investigations. This was also near one of the areas in which brick was deteriorating badly on this front interior wall, and it was anticipated that the unit might provide information regarding soil conditions and moisture towards the street frontage of the building. All identified contexts in Unit B are listed in *Table 3*.

Contexts 1-6 in Unit B were identical to the ones defined for Unit A, with some minor variation in thickness of the slab, mortar, and sand layers. The herringbone brick floor was fixed into the underlying cement slab much more securely in this area, and it was only with considerable difficulty that the brick could be removed. Because of concerns with vibrations from the jackhammer used to penetrate the slab in the Unit A area, a different technique was used to remove it at Unit B. A large Hilti drill (the TE MD 20 electropneumatic rotary hammer) with a 3" bit, provided and operated by Louisiana State Museum staff, was utilized to drill a regular series of holes in the slab (*Figure 53*). These holes were used to create a 'swiss-cheese' effect, so that eventually hammers and chisels could be used to break away segments of the Context 2 cement slab. In this case, the slab was much more firmly embedded in the underlying wire mesh, much of which was removed with the slab. The remainder of the construction material was cleaned by hand, and tin snips were used to trim back additional metal from the wire frame. The sand fill (Context 6) was again removed as a single level, and the start depth for historic strata in the unit was an uneven surface ranging from 32 to 37 cmbd (12.60 to 14.57 inbd). It thus showed less variation than that in Unit A. It also appeared to have been somewhat less impacted by the massive renovation/fill removal/ leveling episode marked by Contexts 1-6, in that, in shallower portions of the unit (those at 32-35 cmbd or 12.6-13.78 inbd), a lens of very dark grayish brown (10YR 3/2) charcoal flecked sandy loam was present. Designated Context 14 and predominantly located in the southeast portion of the unit, it represents a remnant of one of the later-nineteenth-century midden deposits. It rests directly on Context 15, a dark grayish brown (2.5Y 4/2) silty clay loam, that most likely represents the same early-mid-nineteenth-century fill episode as Context 7 in Unit A. A wooden stake associated with the modern leveling episode extended into Context 14 and 15.



Figure 53. Drilling of cement slab in Unit B area, facing northeast.

Context Number	Provenience	Description	Depth	Association
1	Entire Ground Floor Interior	Herringbone Pattern Brick Floor	10-15 cmbd	1990s Renovation
2	Entire Ground Floor Interior	Hard Cement Bed for Brick Floor	15-26 cmbd	1990s Renovation
3	All Units	Soft Powdery Mortar/Cement	20-26 cmbd	1990s Renovation
4	All Units	Thin Wire Mesh Bedding for Cement	25 cmbd	1990s Renovation
5	All Units	Plastic Sheeting Moisture Barrier	26 cmbd	1990s Renovation
6	All Units	Clean Sand Fill	26-38 cmbd	1990s Renovation
14	Unit B	Remnants of Late 19th Century Midden	35-38 cmbd	ca. 1850-1870
15	Unit B	Silty Clay Fill	37-50 cmbd	ca. 1820-1850
19	Unit B	Silty Loam Trench Fill	48-68 cmbd	ca. 1790-1820
21	Unit B	Brick Rubble Layer	50-66 cmbd	post 1788 fire cleaning
22	Unit B	Burned Layer	55-70 cmbd	1788 fire debris
25	Unit B	Concentration of Mortar in Context 21	55 cmbd	1788 fire debris
26	Unit B	French Colonial Ground Surface/Midden	60-75 cmbd	1720s-1760
28	Unit B	Brick Alignment in Context 26 (Possible Lined Post)	55-65 cmbd	1720s-1760
29	Unit B	Transition to Pre-1730s Ground Surface	70-72 cmbd	1720s-1760
30	Unit B	Decomposed Wood (Plank Wall)	75-83 cmbd	1718-1729
31	Unit B	Possible Wall Trench/Fill	75-83 cmbd	1718-1729
32	Unit B	Heavily Mottled Early Colonial Surface	75-90 cmbd	1718-1729
33	Unit B	Madame John's Legacy Primary Structure, Subsurface Portion of Front Interior Wall	N/A	1788 rebuilding
34	Unit B	Silty Clay Subsoil	75-85 cmbd	N/A
35	Unit B	Gleyed Moist Clay Subsoil	90-95 cmbd	N/A
36	Unit B	Concentration of Artifacts, Top of Context 19	48-50 cmbd	1795-1820

Table 3. Contexts Identified in Unit B.

Context 15 was excavated in 3 levels, although the second two levels were combined as a single effort. The context began at anywhere from 32 to 37 cmbd (12.60 to 14.57 inbd), and it ended at 47 cmbd (18.5 inbd). It became increasingly clayey as it approached its maximum depth. At this point, a dramatic change was noted, with a dense lens of early-nineteenth century ceramics, predominantly decorated pearlware tableware, marking the transition to Contexts 19 and 21 (*Figure 54*). This lens of artifacts was collected as a single unit within Context 19 and corresponds closely with the first step outwards of the brick wall foundation for the extant Madame John's front wall (hereafter referred to as Context 33). The step out of this wall is somewhat different than that noted for the rear wall, extending out more prominently and regularly, to about 6 cm from the wall edge of the upper courses. The soil matrix of Context 19 itself is a loosely consolidated very dark grayish brown (10YR 3/2) silt loam with some loose brick rubble. Though Context 19 was removed in two levels, the extent of the brick in and adjacent to it caused the levels to extend deeper than initially planned, with a visibly burned matrix appearing just beneath it. The ground surface thus exposed varied from 55 to 60 cm (21.65 to 23.62 in) in depth. It was initially assumed that Context 19 represented demolition of earlier structures following the 1788 fire. However, upon further investigation during profiling, Context 19 was found to correspond with fill associated with the construction of the front wall foundation for the standing Madame John's building. Because it had filled in and covered the loose brick debris from the fire (and probably been deposited very soon afterwards), the division between it and the Context 21 debris layer was not immediately evident. As collected in the field, cultural material from the two contexts is likely somewhat mixed, and the majority of brick recovered in Context 19 actually originated in Context 21. Context 21 itself was a deposit of very dark grayish brown (10YR 3/2) sandy loam, marked by significantly more evidence of burning, with burned shell, mortar, and large brick fragments prevalent. Some melted glass and heat-altered ceramics were also noted. Context 21 was excavated in two levels, to a depth of about 65 cmbd (25.59 inbd). The final level of Context 21 likely contains some material from Context 22, as the looseness of the fill made it difficult to separate the soils, especially in the southeast corner of the unit, where large amounts of burned mortar probably represented a destroyed earlier floor surface. This was designated Context 25.

When Context 21 was removed, a uniform deposit of charcoal and ash stained soils was noted throughout the unit. This lens, a black (10YR 2/1) sandy loam, rich in burned shell and mortar was removed as a single deposit representing the 1788 fire event. It was typically no more than 2 cm (0.79 in) thick and was collected as a flotation sample. Beneath the ash and charcoal, at 67 cmbd (26.38 inbd), was Context 26, presumably representing the Colonial period ground surface. Context 26 is a very dark grayish brown (2.5Y 3/2) silty loam with increasing clay content and large quantities of mortar, especially in the southeast quadrant of the unit. Artifacts collected appear to be consistent with the French Colonial period, including faience, Saintonge-glazed wares, and lead-glazed redware. In addition, multiple fragments of a distinctive hand-formed red-slipped or filmed ware, assumed to be of Native American manufacture, were found in Context 26 (*Figure 55*). These were concentrated along the north wall, very near the base of the Context 33 foundation

(which was also identified in Context 26). These wares have previously been reported predominantly within earlier Colonial contexts (i.e. 1700-1750) and may be exclusively associated with French-Native contact.

At the top of Context 26, a concentration of brick, including two brick aligned in an 'L' shape, was noted in the southwest quadrant of the unit. By the second level of Context 26, at about 70 cmbd (27.56 inbd), it was noted that soils seemed somewhat more dry and consolidated in this vicinity. As a result, the area of the unit was assigned Context 28 and was collected as a single sample. Context 28 was characterized by lighter soils, varying to gray (10YR 5/1) in color. However, no further characteristics suggesting that this feature were structural in origin were noted during excavation. It rested on the same soils that characterized the remainder of the unit below Context 26, the Context 29 transition to subsoil at 72 cmbd.



Figure 54. Concentration of pearlware at top of Context 19/21, facing east. Note additional brick footing course at left.



Figure 55. Red-filmed Native American pottery recovered from French Colonial deposits (top row); Rouen polychrome faience plate rim (bottom), both from Context 26.



Figure 56. Contexts 30 and 31, possible plank wall and associated trench in Unit B, facing east.



Figure 57. East wall profile of Unit B. Note break in stratigraphy along wall at left.

Context 29 is a dark gray (10YR 4/1) silty clay with occasional brick fragments, oyster shell, and other artifacts. However, during excavation of Context 29, a dark, organic stain very dark brown (10YR 2/2) in color was noted extending across the unit from southwest to northeast. Small quantities of a slightly siltier fill with mortar flecks appeared to be associated with it. The organic stain was most pronounced at the west edge of the unit. This narrowed from 4 cm to 1 cm (1.57 to 0.39 in) in width from west to east, while the possible associated fill surrounding it was wider at the east, forming a band about 6 cm (2.36 in) wide at its greatest extent. The organic stain was designated Context 30, and the surrounding fill was designated Context 31 for the purposes of excavation (*Figure 56*). They were first noted at a depth of 75 cmbd (or 29.53 inbd, just beneath the Context 26 French Colonial deposits) and extended as deep as 85 cmbd (33.46 inbd). The entirety of the Context 31 fill was removed as a flotation sample.

During excavation of the Context 31 fill, it was noted that the soil in the north section of the unit, to the north of the Context 30/31 feature, was considerably more mottled than that to the south, which seemed to be consistent with the typical subsoil at the site. The area to the north consisted of a heavily mottled mixture of silty clay and moist clay, a dark gray (10YR 4/1) streaked with olive brown (2.5Y 4/3) and dark reddish brown oxidation (5YR 3/4) to a degree not consistent with subsoils in the area. Also noted were charcoal stains, bits of brick, and bits of burned shell, sometimes occurring in sandier pockets within the surrounding soil matrix. Such pockets, along with occasional larger fragments of cultural material, occurred to a depth of 92 cmbd, an additional 15 cm (5.91 in) into what had initially been identified as subsoil. Few of the artifacts were diagnostic, but a Saintonge-type green glazed sherd, a hand wrought nail, and some fragments of animal bone were recovered. It is possible that, if Context 30/31 does represent a wall, these pockets may represent early use of the lot, when the unstable, muddy ground surface allowed cultural material to be pressed down and mixed with clay subsoils. This area was designated Context 32 for the purpose of excavation. Beneath these pockets, at 95 cmbd (37.40 inbd), the soil became more consistent in clay content and gleyed (Gley 1 5/1 to 4/1), suggesting that the unit was nearing the water table (*Figure 57).*

Unit C Excavations. Initially, Unit C was planned as an additional 1 x 1 m excavation on the eastern side of the building, to be located away from the walls so that a sample of material not impacted by later construction could be collected. However, between the time in which excavations were planned and in which excavations were undertaken, the room in which this unit was to be located was utilized by Louisiana State Museum Foundation personnel for temporary storage. After the extent of the slab underlying the brick floor was uncovered in Units A and B, it was elected to change the focus of Unit C. The Tulane conservation team had planned to install a subsurface moisture-monitoring device within the interior of the building, so emphasis for Unit C was shifted to opening a small area for this purpose. As the monitor only needed the top of the historic ground

surface exposed, excavation was limited to just that sufficient to insert the monitor along a central interior wall.

For the purpose of the Unit C excavation, brickwork was removed and the cement slab exposed in an approximately 30 cm (11.81 in) square area immediately adjacent to a wall segment in which probes had already been placed by the Tulane team. No unit datum was established in this area, so all measurements refer to ground surface at the top of the brick surface (Context 1, from 0-5 cmbgs or 1.97 inbgs). The slab in this area was demolished using the same technique as had been used for the Unit B area (i.e. perforation using a large electropneumatic drill). The cement/metal lining/plastic sheeting barrier combination (Contexts 2-5) was somewhat thinner in this area, extending to only 13 cmbgs, although the brickwork itself was, again, laid very securely into it. The Context 6 sand layer also proved to be somewhat less substantial in this room, as it ended at 25 cmbgs (9.84 inbgs). This had a direct impact on the soils beneath, as a much more substantial apparent late nineteenth century midden and destroyed mortared floor surface was encountered beneath it (*Figure 58*). Designated Context 11, it consisted of a very dark grayish brown (10YR 3/2) sandy loam with large quantities of fragmented mortar. Large numbers of small mammal bone fragments were also noted in this fill. It was excavated to 44 cmbgs (17.32 inbgs). By this point, the soil had become much more clayey and appeared similar in content to Context 7 in Unit A and/or Context 15 in Unit B. It is assumed that Context 11 represents one of the later strata stripped away during the renovation in which Contexts 1-6 were placed. The excavation of Unit C was terminated at 44 cmbgs (17.32 inbgs), as the moisture monitor required the soils to remain undisturbed below this depth to give accurate readings. After the monitor was inserted, the excavated soils were replaced so as to approximate the prior stratigraphy as closely as possible.



Figure 58. Unit C excavation area, facing north.

4.3 Laboratory Analysis

4.3.1 Analysis of Masonry Materials

Brick

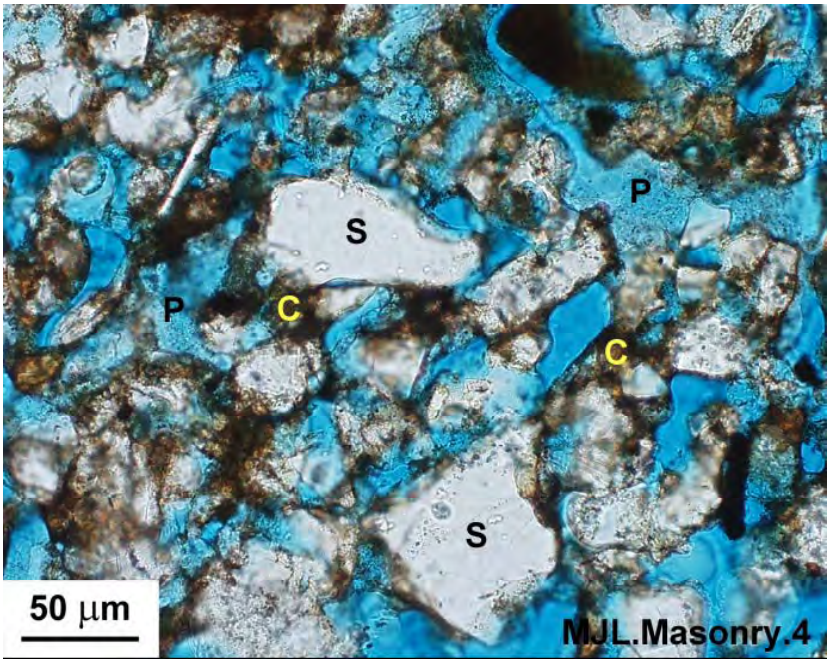
Two brick samples (*MJL.Masonry.4* and *MJL.Masonry.5*) were examined petrographically by Highbridge Materials Consulting. Both brick were removed from the same location (the southwest former exterior wall of the ground floor, now enclosed by a bathroom) and are believed to be from the same period of construction, although they differ slightly in terms of color and visual appearance. The location where the brick was removed is currently concealed by a bathroom closet, and it has therefore escaped the numerous campaigns of re-pointing and reconstruction that the rest of the ground floor has been subjected to. These brick are believed to represent the building's original brick, possibly dating to 1788.

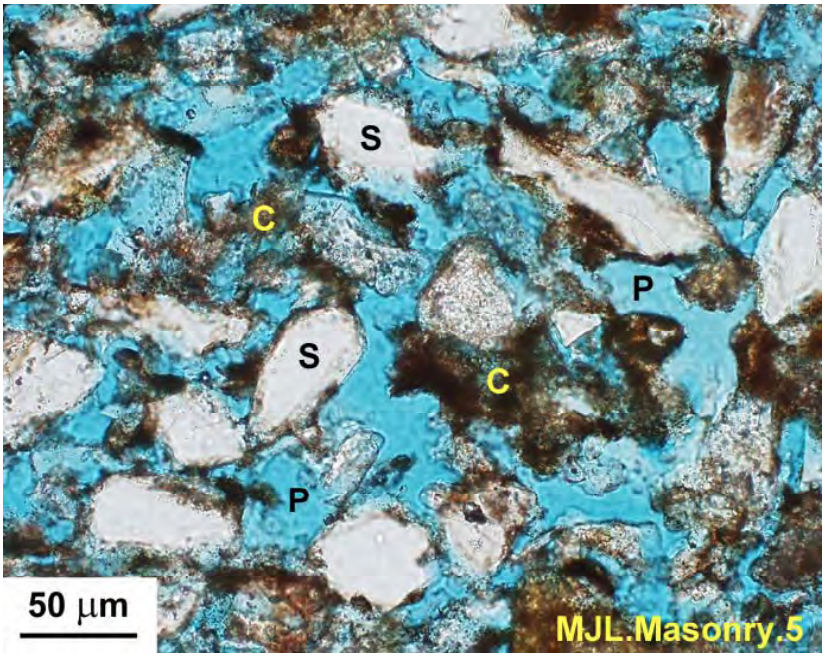
Both of the brick that were examined are composed of the same material, a single source highly silty clay with no temper (water) addition. The same clay source suggests that the brick are from the same origin and perhaps the same manufacture date. Both brick are considered to be low-fired, although sample *MJL.Masonry.5* represents a higher temperature product with a harder matrix.

Both brick are microstructurally uniform and were well-consolidated during forming. However, the clay component of the matrix is sparse and barely coats the closely packed silt grains, resulting in a fine interconnected void structure. This fine, interconnected void structure results in an overly permeable brick that is highly susceptible water infiltration through capillary action and the diffusion of salts. In addition, because the silt grains are only minimally coated with the clay (which serves as an adhesive of sorts) and therefore weakly bonded to one another, they are not as resistant to the tensile stresses produced by salt crystallization or hydration. *(Figures 59-60)*

Both of these characteristics help to explain the deterioration mechanisms at play on the ground floor of Madame John's Legacy. The high permeability of the brick promotes the absorption and wide distribution of salt-laden moisture from the ground, as well as external sources of water related to poor site drainage and a water conduction system that is in disrepair. This characteristic helps to explain the prevalence of the salts within the core of the wall and also extending up the entire height of the wall. The salts travel easily thorough the highly permeable brick. In addition, the lack of adequate cohesion within the bricks themselves, due to the sparse amount of clay coating the silt particles, results in a brick with poor tensile strength. The lack of cohesion and tensile strength makes the brick at Madame John's Legacy susceptible to the pressures created through the hydration and crystallization of salts, and results in the extensive loss of material visible throughout the ground floor.

See *Appendix F* for Highbridge's full report on the brick samples removed from the building.





Figures 59 and 60. Plane-Polarized Light (PPL) photomicrographs of samples MJL.Masonry.4 and MJL.Masonry.5 illustrating the overall texture and microstructure of the two brick samples. Both are impregnated with a low-viscosity, blue-dyed epoxy to highlight voids, pores, and cracks. Silt grains (S) are angular and quite closely packed. The fired clay (C) barely coats the silt particles, leaving much of the interstitial space unfilled. These unfilled pores (P) are ubiquitous and interconnected resulting in a high porosity and permeability. (Photographs courtesy of Highbridge Materials Consulting)

Mortar

The mortars analyzed by Highbridge as part of this study are both identified as "lime-stabilized" earthen mortars. Earthen mortars are typically based on locally-available soils or clay deposits. In the case of New Orleans, the locally available soil is primarily a silty clays. Therefore, mortars made with the locally-available soils will tend to have both a clay (binder) and silt (aggregate) component that derives directly from the soil. In addition to the clay binder, the mortars at Madame John's Legacy have a lime addition that helps to stabilize and strengthen the mortar. (*Figures 61-62*)

The two earthen mortars analyzed by Highbridge have similar constituents and properties. They are similar enough that a common construction date seems plausible, although the chimney and ground floor walls could date to two different but relatively close points in time (such as the original 1788 construction date attributed to the first house and the foundation walls, and the 1794 reconstruction).

The earthen binder of both mortars is a silty clay and this is estimated to represent the majority portion of each sample. The lime, which serves to stabilize the mortars, is a non-hydraulic binder burned from oyster shell. The aggregate portion of the mortar is limited to the fine-particled silt derived from the soil. No additional sand appears to have been added beyond that which is natural occurring in the soil. The quantities of these original components, typically determined through chemical analysis and acid digestion, was not performed as part of this study.

Both mortars are uniform in appearance, although they differ in color. Sample MJL.Masonry.1, removed from the attic chimney, is tan in color (Munsell color code approximately 1Y 7/2) and Sample MJL.Masonry.2, removed from the ground floor wall, is brown (approximately 10YR 5/3). The difference in color suggests a different source of clay for each mortar, although both are assumed to be local.

The characteristics of the mortars observed petrographically indicate that the mortars were well prepared, blended, and consolidated. They are also fully carbonated. The hardened mortar products are soft, permeable, and more or less friable. Even though they are identified as being highly absorptive and having high capillary porosity, no signs of microcracking (microscopic deterioration) or salt deposits were detected within the mortar pieces examined as part of this study. However, fine clusters of gypsum crystals are found in association with mortar sample *MJL.Masonry.2*, removed from the southwest wall of the ground floor. (*Figures 63-64*)

Like the brick, the original earthen mortars used for the construction of the masonry ground floor at Madame John's Legacy have characteristics that help to explain the deterioration processes visible on the building. The highly permeable mortars readily absorb moisture, including salt-laden ground moisture, and distribute it through the masonry. The combination of a permeable mortar and a highly permeable brick results in a particularly absorptive masonry assembly. The soft nature

of the original earthen mortars would have helped to accommodate any movement or stresses in the brick wall assembly, a characteristic that the more modern and harder Portland cement-based mortars do not have.

The presence of Portland cement-based re-pointing mortars at Madame John's Legacy is a significant problem. Not only are these mortars harder, denser and less permeable than the original mortar (and the original brick), they are also likely introducing soluble sulfate salts into the masonry (as discussed in the following *Section 4.3.2*). The original earthen mortar, although highly absorptive, would have allowed moisture out of the wall through mortar joints due to its permeability. By contrast, the current Portland cement-based re-pointing mortar serves to trap moisture in the wall and likely accounts for the high concentration of salts present at the core of the walls examined in the current study (as discussed in *Section 4.3.2).* The denser modern mortars also force salt-laden moisture out of the wall through the brick instead of the mortar joints, a factor that exacerbates the poor condition of the brick by greatly increasing the quantity of salts present in the brick.

See *Appendix F* for Highbridge's full report on the mortar samples removed from the building.





Figures 61 and 62. The bulk mortar samples as received by Highbridge. (Photographs courtesy Highbridge Materials Consulting)

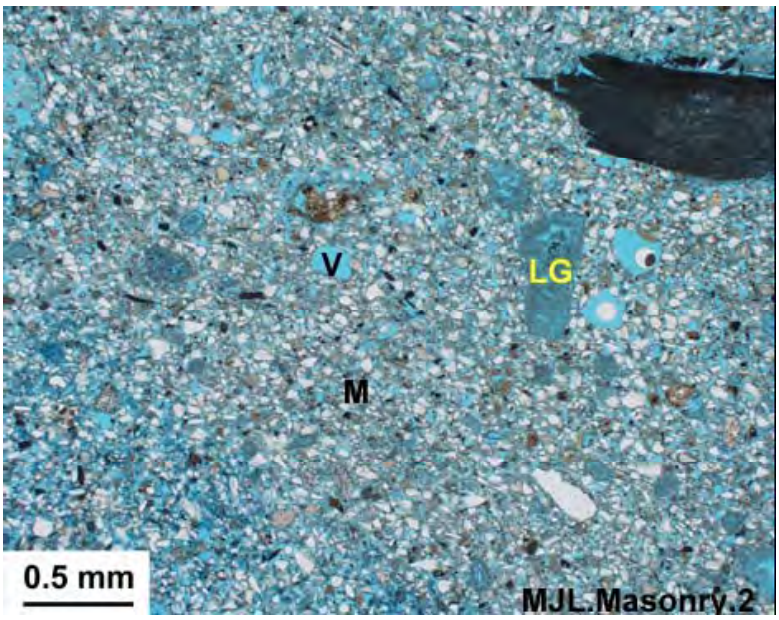


Figure 63. Plane-Polarized Light (PPL) photomicrograph of sample MJL.Masonry.2, illustrating the overall microtexture of the mortar sample. The sample is impregnated with a low-viscosity, blue-dyed epoxy to highlight voids, pores, and cracks. The matrix (M) consists of a fine silty clay, with silt grains appearing as the fine white particles. The matrix has a high capillary porosity as indicated by the absorption of blue-dyed epoxy. Undispersed lime grains (LG) are present. The mortar is well consolidated and air-voids (V) are minimal. (Photograph courtesy of Highbridge Materials Consulting)

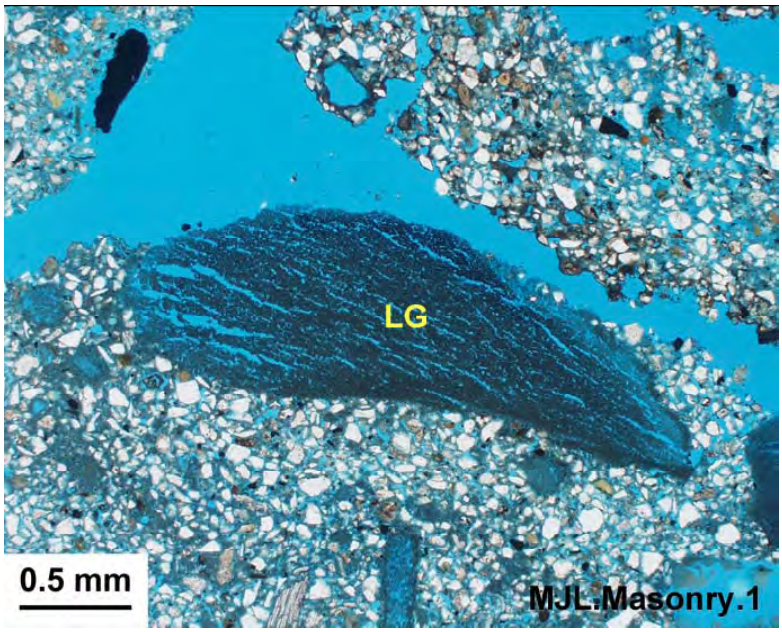


Figure 64. Plane-Polarized Light (PPL) photomicrograph of mortar sample MJL.Masonry.1 illustrating an undispersed lime grain (LG) that contains internal fractures with a wavy, laminated distribution indicative of oyster shell. Such undispersed lime particles are not uncommon, but the lime is generally well-blended with the clay binder. (Photograph courtesy of Highbridge Materials Consulting)

Stucco

Although not directly related to interior masonry walls that are the subject of the current study, a sample of exterior stucco was removed and analyzed. The intent of the analysis was to identify historic stucco materials used on Madame John's Legacy and also to provide information to guide future re-stuccoing campaigns. The sample was removed from the northwest (lake side) wall of the ground floor, and it was located under later more modern stucco layers. It was not known whether the sampled stucco was original to the building or when Madame John's Legacy received its first stucco application, or if the use of stucco is even original to the building. (*Figure 65)*

Highbridge identified the stucco in sample *MJL.Masonry.3* as a pure, natural cement stucco containing a medium to fine-grained and narrowly graded quartz sand. The natural cement has microscopic characteristics that indicate it is an American product. The presence of natural cement dates the installation to no earlier than ca. 1830, and probably no later than ca. 1895 (the point in time when the production and use of Portland cement overtook that of natural cement). The 1830-1895 window identified for this material means that it is not original to the building, but it still may have been a relatively early addition to the masonry.

A natural cement is defined as an eminently hydraulic lime that is typically derived from the burning of highly impure limestone. It is these impurities that give the lime the characteristic of hydraulicity, or the ability to set by reaction with water (no air is needed, unlike with pure high calcium limes). Natural cements differ from Portland cements, which were produced later, in that the latter are artificially produced. Portland cements of the 19th century were made by grinding together chalk and clay and then heating the mixture at high temperatures to produce a simulated natural cement.[25] Both natural and Portland cements can have quite high strength and durability. Natural cement based mortars were quite common in the mid to late 19th century.

The stucco sample analyzed indicated that the stucco components are well-mixed and relatively well-consolidated. The total air content is estimated at 8-10% by volume. The stucco has a moderate hardness and a moderately high permeability. The material is uniform in appearance with a light brownish gray color (Munsell color code approximately 10YR 6.5/2.5). Some secondary deposition of calcium carbonate was noted and in some cases the carbonate appears to heal fine microcracks at paste-aggregate contacts. Although the proportions were not quantified as part of the analysis, petrogtraphic examination indicates that the sand is densely distributed and the material appears oversanded. (*Figure 66)*

See *Appendix F* for Highbridge's full report on the stucco sample removed from the building.

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[25] Edwin C. Eckel. *Cements, Limes and Plasters. Reprinted Third Edition.* Dorset: Donhead Publishing, 2005, 242.



Figure 65. The bulk sample of stucco (MJL.Masonry.3) as received by Highbridge. (Photograph courtesy of Highbridge Materials Consulting)

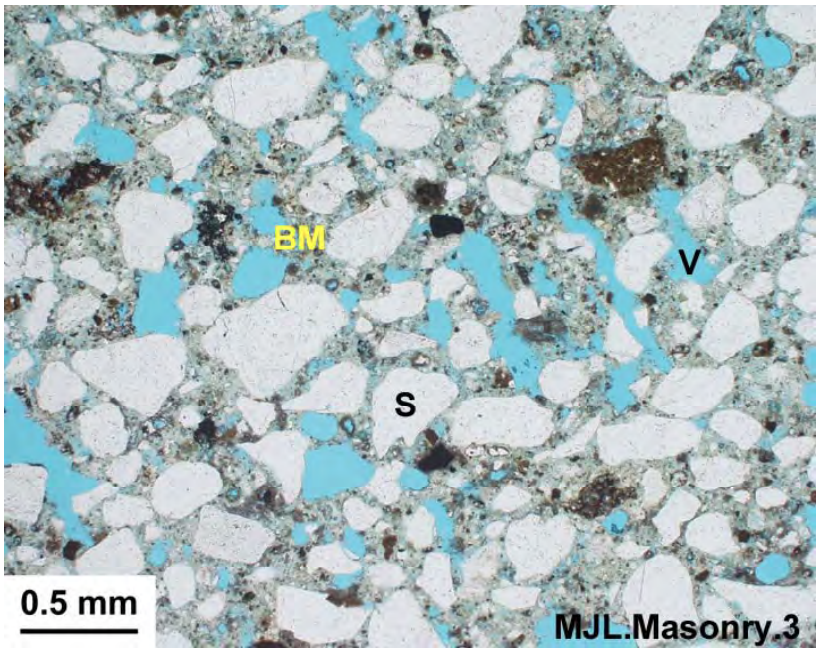


Figure 66. Plane-Polarized Light (PPL) photomicrograph of sample MJL.Masonry.3 illustrating the overall microstructure of the natural cement stucco sample. The sample is impregnated with a low-viscosity, blue-dyed epoxy in order to highlight cracks, pores, and voids. The binder matrix (BM) has a relatively high capillary porosity and the matrix is moderately permeable as a result. Sand grains (S) have a narrow particle size distribution often found in natural cement stuccoes and mortars. However, the grains are quite closely packed and the stucco is considered oversanded. Though moderately well consolidated, the higher sand content results in a higher content of air-voids (V). (Photograph courtesy of Highbridge Materials Consulting)

4.3.2 Analysis of Salts

The analysis of ten samples for salt content performed by Dr. George Wheeler revealed the presence of three salts in the materials removed from the ground floor of Madame John's Legacy: sodium chloride (NaCl), sodium nitrate ($NaNO_3$) and potassium nitrate (KNO_3). All salts presumably originate from the soil beneath the walls, which was tested as part of the analysis and found to contain both chloride and nitrates (albeit in small amounts).

The presence of chlorides and nitrates in the soil of a place like New Orleans makes sense. It is below sea level and subjected to the infiltration of salt water (sodium chloride). Nitrates are commonly found in soil, the result of decomposing organic matter. Air pollution can also be a source of nitrates, but given that the soil at Madame John's Legacy (see results for Sample A) tested positive for nitrates, that is believed to be the primary source. The soil is also believed to be the primary source of the chlorides. Deicing salts would be another possible source for sodium chloride, but given the climate, the use of deicing salts is highly unlikely. Although the amounts of chlorides and nitrates in the soil is small, the continual uptake by the walls of salt-laden moisture from the soil over decades, in fact centuries, would lead to the gradual accumulation of salts in the walls in the quantities that are now present. The wall is constantly fed with salt-bearing moisture from the soil, so the salts are constantly accumulating at the point of evaporation (which differs by salt type).

Previous flooding may have also contributed to the salts in the walls, carrying seawater and organic matter directly to the surface of the ground floor walls. In addition, infiltration of rainwater (e.g. from overflowing gutters, leaking downspouts or poor site drainage) can also introduce soluble salts into masonry. This study documented the various points of source moisture at Madame John's Legacy (*Figure 27),* which are known to be affecting the brick walls of the ground floor. These same external sources of moisture are most likely also introducing salts into the masonry, in addition to those traveling up the wall from the soil.

The results of the salt analysis are summarized in *Table 4* on the following page and also in *Figures 40-41*. The table indicates which salts are present in each sample and the concentration they exist in. The concentration is expressed as a weight/weight percentage, meaning the percentage of the material that contains salt (by weight). As indicated in this table, all of the masonry samples analyzed contain salts in a sufficient amount to cause deterioration (> 0.1% weight/weight). Some samples had extremely high concentrations of salt, most notably Sample E (taken from the center of the core removed from the middle of wall 281-SE-1), Sample F (taken from the outside face of the core removed from the top of wall 281-SE-1) and Sample I (taken from the center of the core removed from the top of wall 282-NE-2). In these samples, the salt content ranged from nearly 3% to 5.5% (by weight).

The high amounts of salts at the center of the walls in two separate locations indicate that the presence of salts is not limited to the surface of the walls and, in fact, their concentration may be higher in the cores of the walls. In addition, the salt content at the tops of walls is also high, according to the samples analyzed, and these areas of the walls typically have the most damage.

The salt types and concentrations are also visually depicted in Figures 40 and 41. This graphic documentation indicates that there is not a particular pattern in terms of salt concentrations, although the number of samples analyzed was relatively low and prevents a true statistical analysis from being performed. However, the documentation does effectively illustrate that salts are present in all portions of the masonry wall, external and core locations, and that they typically occur in combination with one another.

The results of the laboratory analysis, when viewed in concert with the visible evidence of salt formation, suggest that salts are present in relatively high amounts throughout all of the brick masonry of the ground floor of Madame John's Legacy. More importantly, the walls will continue to absorb salt-laden moisture from the soil below grade, so the source of salts is active.

The one surface salt analyzed (Sample J), a crust-like salt scraped off the surface of Wall 281-NE-4 (adjacent to the long-term monitoring sensors), was identified as potassium nitrate. Although nitrates are not typically thought if as one of the more damaging salts for masonry, the location where the sample was removed was very damaged by salts. (*Figure 67*)

Table 4. Results of Salt Analysis (Characterization and Quantification)

Sample	***Salt ID***	***weight/weight % salts (depending on ID)***		
		$NaNO_3$	***NaCl***	***KNO_3***
A (soil)	chloride, weak nitrate*		---low---	
B (Room 281-Core 1, Section A)	chloride, weak nitrate*	<0.34	<0.34	<0.34
C (Room 281-Core 1, Section D)	chloride, nitrate*	0.26	0.26	0.26
D (Room 281-Core 2, Section A)	sodium chloride†		0.51	
E (Room 281 – Core 2, Section B)	sodium nitrate†	5.44		
F (Room 281 - Core 3, Section A)	sodium nitrate† sodium chloride†	5.37	 2.78	
G (Room 281 - Core 3, Section E)	sodium chloride† sodium nitrate† potassium nitrate†	0.26		 0.26 0.26
H (Room 282 – Core 3, Section A)	chloride, weak nitrate*	0.57	0.57	0.57
I (Room 282 – Core 3, Section E)	sodium chloride†		2.69	
J (Surface salt from Wall NE-4)	potassium nitrate†	no data-surface salt		

† ID performed by XRD
* ID performed with Quantofix strips

Although the current analysis did not identify any sulfate salts in the samples analyzed, the previously-performed GCI research did. They documented sodium sulfate salts (mirabilite and thenardite) and gypsum (calcium sulfate) in multiple locations. In addition, analysis of mortar removed from the southwest ground floor wall performed by Highbridge Materials Consulting as part of the current study (sample *MJL.Masonry.2*), indicates the presence of sulfate deposits. These sulfates are likely originating from adjacent areas of re-pointing using Portland cement. Although *MJL.Masonry.2* was intentionally taken from an area with minimal re-pointing, modern mortars are still present relatively close by on this wall.

Although it is not clear why the samples analyzed as part of the current study did not contain sulfates, the previous Getty findings as well as the Highbridge analysis indicate they are present in the brick masonry at Madame John's Legacy. Therefore, it should be assumed that sulfates are present. Sulfate salts are typically associated with Portland cement mortar materials, as Portland cement usually contains alkali sulfates. Sulfate salts can also originate from atmospheric pollution. Given the prevalence of repair and re-pointing campaigns on the brick walls of the ground floor, all of which are 20th century materials that contain Portland cement, it is safe to assume that sulfate salts are present along with the nitrate and chloride salts identified as art of the current study.

On a wall with rising damp, as is present at Madame John's Legacy, salts crystallize at different heights depending on their solubility. The less soluble salts (gypsum, potassium nitrate and sodium sulfate) typically crystallize at the bottom and lower middle of the wall, while the most soluble salts (sodium nitrate and sodium chloride) crystallize at the upper portion of walls, since they can travel farther in solution.[26] This trend is supported by the GCI research, which found that the sulfates typically occur at the bottom of the wall at Madame John's Legacy, and the current research, which found the heaviest concentrations of nitrates and chlorides at the upper portions of the walls (where evaporation of these highly soluble salts occur). While there is a general understanding in the conservation community of how individual salts behave in masonry, the way mixtures of different salts behave, and how they impact one another, is less understood and is quite complex. For instance, it is known that the simultaneous presence of two salts affects their behavior in solution and their individual solubility (increasing it in some cases).[27] The presence of multiple salts can also result the lowering of the relative humidity required for precipitation, which increases the frequency of the crystallization/dissolution cycle.[28] Sodium sulfate salts are generally considered the most damaging to masonry because of the salt crusts that the form on the surface or just below the surface of the masonry. However, any salt can form damaging crusts under the right condition;[29] as evidenced by the potassium nitrate crust identified on Wall 281-NE-4. (*Figure 67)*

[26] Charola A. Elena. :Salts in the Deterioration of Porous Materials: An Overview". Journal of the American Institute for Conservation. Vol. 39, No. 3, 2000. Page 330-1.
[27] Ibid, 331.
[28] Ibid 329.
[29] Ibid, 331.



Figure 67. A sample of this surface salt on Wall 281-NE-4 (adjacent to the long-term monitoring sensors) was identified as potassium nitrate. Note the extensive damage caused to the brick by the salt.

4.3.3 Analysis of Paint Finishes

BCA found early finish evidence on the clapboards of the front, rear, and lakeside elevations, as well as on the ceiling boards and ceiling joists of the front and rear galleries. A sample taken from a bracket in the front gallery yielded the largest number of paint layers, most of them predating the earliest finishes found on other elements. Limited early paint finishes were identified on a window frame on the front elevation; however, the early finishes had been largely removed and significantly disrupted and therefore yielded little information regarding the earliest extant paint color on the frames (*Figures 68-71).*

A fairly large number of exterior elements were found to have been replacements from the various repair and restoration campaigns that occurred through out the building's history. The window frames, door frames, and window and door shutters were all found to either be replacements or to have been stripped of their early finish layers. Additionally, the majority of the balustrade, handrail, and columns of both the front and rear galleries were found to be replacements or otherwise lacking early finish information. Investigation of these elements yielded only 20th Century paint histories that likely correspond to the 1970's restoration campaign, based on the stratigraphy found on a sample taken from a known 1970s infill clapboard (*Figure 72*). This 1970s paint stratigraphy was generally found to represent the most recent finish history of all collected samples.

From the original elements sampled, BCA has identified two early existing paint schemes for Madame John's Legacy, one that relates to the building's late 18th c. appearance and one most likely dates to its early 19th c. appearance. Information for both schemes is unfortunately only partial, since so much of the exterior woodwork has been replaced or its paint stripped. Although only a partial understanding of these early paint schemes can be gleaned from this study, the information is nonetheless informative.

BCA found that the clapboards of the front and rear galleries had a dark gray with a slight olive green cast as the first finish campaign. This gray-colored paint is likely the same paint layer interpreted as "medium green yellow" by Fore. Linseed oil-based paints, which these early paints at Madame John's Legacy likely are, are known to yellow over time due to lack of exposure to ultra violet light. Fore may not have taken this into consideration in his description of this paint layer. The clapboard of the lakeside elevation had the gray paint occurring as the third finish layer, with two campaigns of red preceding it. This suggests that the clapboards of the side elevations were installed earlier than those of the front and rear elevations. Supporting this, the ceiling boards and joists of the rear gallery and the ceiling joists of the front gallery were found to have evidence of a cream-colored paint as the first finish layer, which is subsequently followed by the gray-green. This cream layer was not found consistently through out the samples, which suggests that most of this original finish was removed before the application of subsequent layers. Additionally, a bracket at the front gallery was found to have the gray at the 17th layer, preceded by a series of creams,

browns, and whites representing multiple earlier finish campaigns. This indicates that the bracket is likely the oldest wooden element at the building exterior and its early layers could possibly date to the 18th Century.

In Fore's report, he indicated that the clapboards were added to the front elevation, applied over a brick-between-post wall with multiple layers of lime wash. Although BCA was not able to investigate behind the existing clapboards in order to confirm the presence of the lime washed surface, the paint evidence generally supports this theory. In addition, the brackets that support the porch ceiling extend underneath the current clapboards (as opposed to being installed in the same plane or on top of the clapboards, as would be more typical), suggesting they were installed before the clapboards.

BCA found limited early finish information on the window frames, door frames, and shutters. While one sample was found to have early finish layers, the layers were badly disturbed and it is not possible to distinguish the first campaign color. The 1983 Fore report indicated that the door and window frames were the same "medium green yellow" (which BCA has interpreted as gray) as the other wood elements of the galleries, so it is possible that these elements were painted to match the clapboards and other elements and were stripped of their finishes or replaced in the years since 1983. Samples from the doorframe and shutters were found to include only the known 1970's paint stratigraphy, the latter having a few layers of dark green paint preceding. Without additional sampling, BCA cannot confirm the presence of the gray on the window and door frames.

A paint sample taken from a window shutter on the river end of the front gallery was found to have a dark forest green as the first finish layer. Fore's analysis indicates that he found his "medium green yellow" on the shutters as well. This would suggest that the existing shutters were stripped of their finishes and painted in the dark green shade some time after the execution of the 1983 analysis, however the presence of the stratigraphy corresponding to the known 1970s infill brings doubt to this conclusion. It is possible that either the Fore analysis misinterpreted this dark green to be the same as the gray-green of the clapboards and other woodwork, or that the 1970s clapboard infill was also stripped and that its paint history corresponds to the 1980s. A dark green shutter would have been a popular choice for buildings in the early to mid 19th century[30], although no conclusive evidence was found to date the green paint to that time period. Black and white photos taken in the 1940s (found in the Library of Congress digital archives) show the house with shutters several shades darker than the surrounding woodwork. (*Figure 73*) Watercolor paintings executed by Alvyk Boyd Cruise between 1937 and 1940 as part of HABS documentation of the building (found in the Louisiana Digital Library) show a polychrome motif, with yellow clapboards, dark green shutters, and blue columns, handrails, and balustrade. It is possible that the green of the shutters

[30] Matero, Frank G. Understanding Regional Painting Traditions: The New Orleans Exterior Finishes Study. APT Bulletin, Vol. 24, No. 1/2 (1992), p. 36-52.

corresponds to this time period, but again, conclusive paint evidence to support this was not found. Anecdotally, a yellow similar in color to that seen in the watercolor paintings was found in a sample taken from the bracket on the front gallery around the 23rd layer and could also correspond to this 1940s paint scheme. (*Figures 74-75*)

See *Appendix I* for photomicrographs of all paint samples and a listing of all paint stratigraphies per sample.



Figure 68. Image showing the front gallery of Madame John's Legacy.



Figure 69. Image showing the rear gallery.



Figure 70. Image showing the lake side(northwest) elevation.



Figure 71. Image showing the front gallery of Madame John's Legacy. The black arrow shows the bracket, which was found to have the earliest paint evidence of any sampled element.

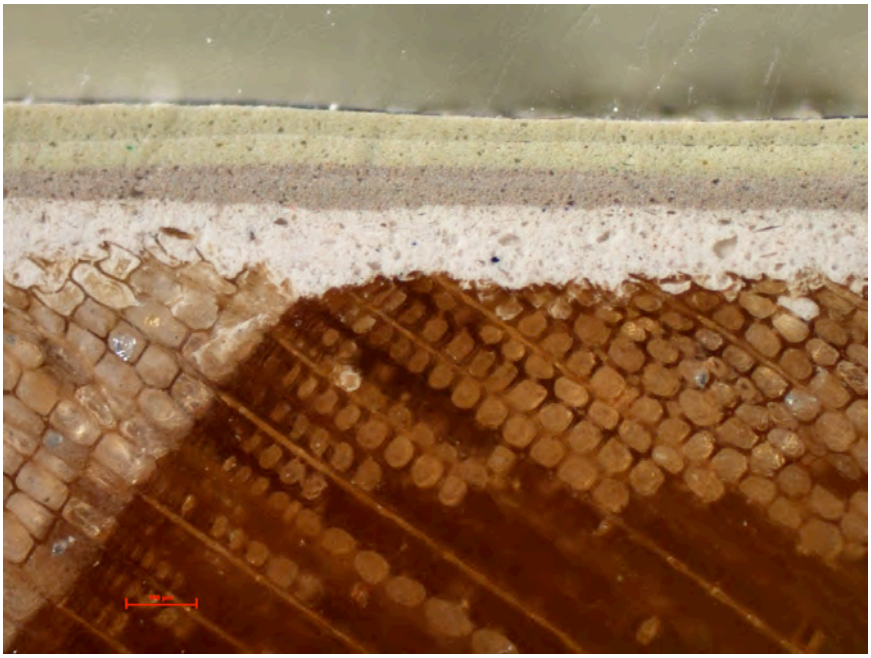


Figure 72. Photomicrograph of a cross-section of a paint sample taken from a know 1970s infill clapboard, shown at 100x magnification.



Figure 73. An image of the exterior of Madame John's Legacy from the Library of Congress Digital Archives, reportedly taken in 1937. Note the dark colored shutters and the lighter clapboards.



Figure 74. A watercolor detail of the front gallery of Madame John's Legacy from the Louisiana Digital Archives, painted by historian and artist Alvyk Boyd Cruise sometime between 1937 and 1940, reportedly as part of HABS documentation.



Figure 75. A watercolor of the front gallery of Madame John's Legacy from the Louisiana Digital Archives, also painted by Alvyk Boyd Cruise during the same survey.

4.4 Monitoring of Environment and Moisture

Evaluation of the initial sensor data and benchmark infrared scan provided some interesting initial observations.

Time-based trend data plots for the wall and soil sensors for the period from initial installation on 07 August through 23 August are presented in *Figure 76* on the following page. The data indicate the following:

- Wall core temperature averaged:
  74.95 °F at 11 inches above finish floor;
  75.92 °F at 35 inches above finish floor;
  76.78 °F at 61 inches above finish floor;
- Wall core relative humidity averaged:
  99.8 %RH at 11 inches above finish floor;
  99.8 %RH at 35 inches above finish floor;
  67.8 %RH at 61 inches above finish floor;
- Soil moisture averaged:
  0.3199 m^3/m^3 at 15 inches below the floor.

The moisture levels in the wall and soil were disturbed somewhat by installation of the sensors. Moisture levels inside the wall appear to have returned to equilibrium within 60 hours. However, soil moisture data suggests a slight drying trend; this may be due to either generalized subsurface moisture changes or vapor leakage at the test sensor location where the floor opening was filled.

Shoriak produced conventional and infrared images (*Figure 77*) of Wall 281-NE-4 immediately prior to installation of the sensors; select sensor data have been added by Henry to the images.

When compared, direct observations of salt damage, instrumented readings of wall moisture and infrared thermal scans of the 281-NE-4 wall are generally consistent and correlate well to each other. Notably, the temperature gradient of the wall core is quite small, suggesting that thermal images of the wall surface will be more indicative of density differences (due to moisture) and evaporative cooling at the wall surface than of actual thermal gradients due to the influence of soil temperature at the wall base.

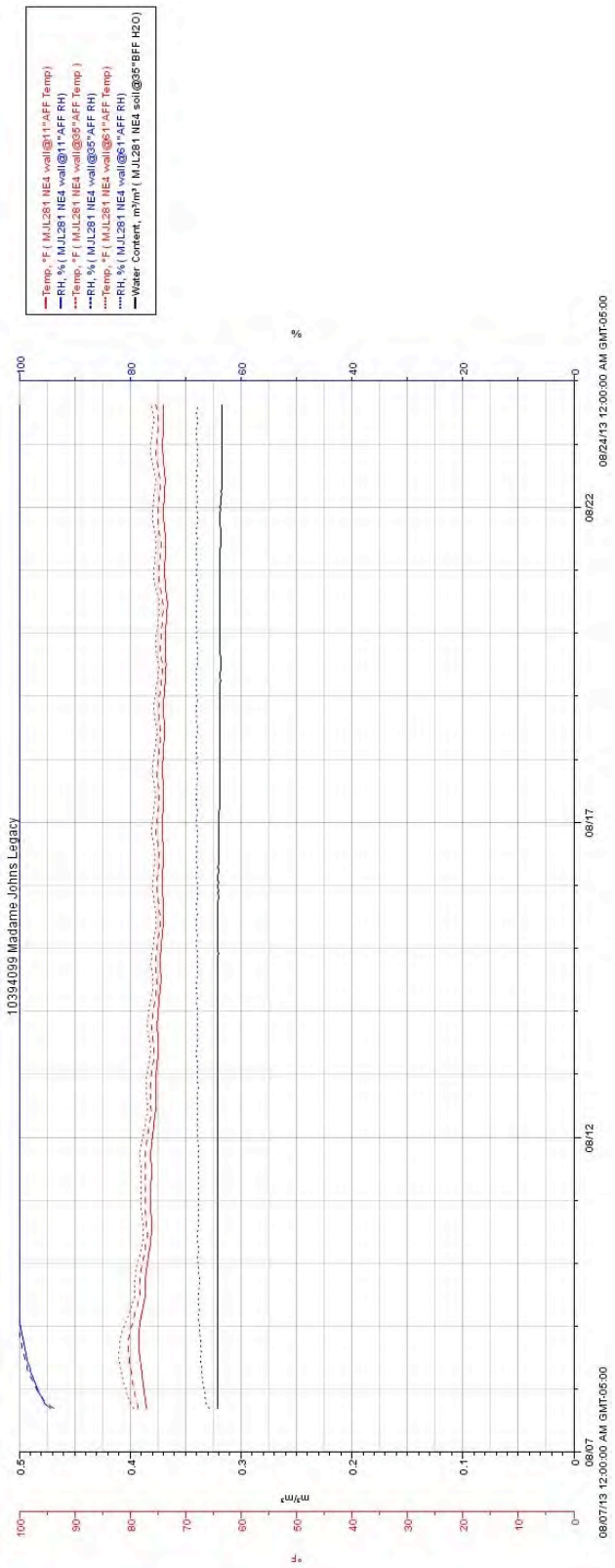


Figure 76. Time-based trend data plots for the wall and soil sensors for the period from initial installation on 07 August 2013 through 23 August 2013.

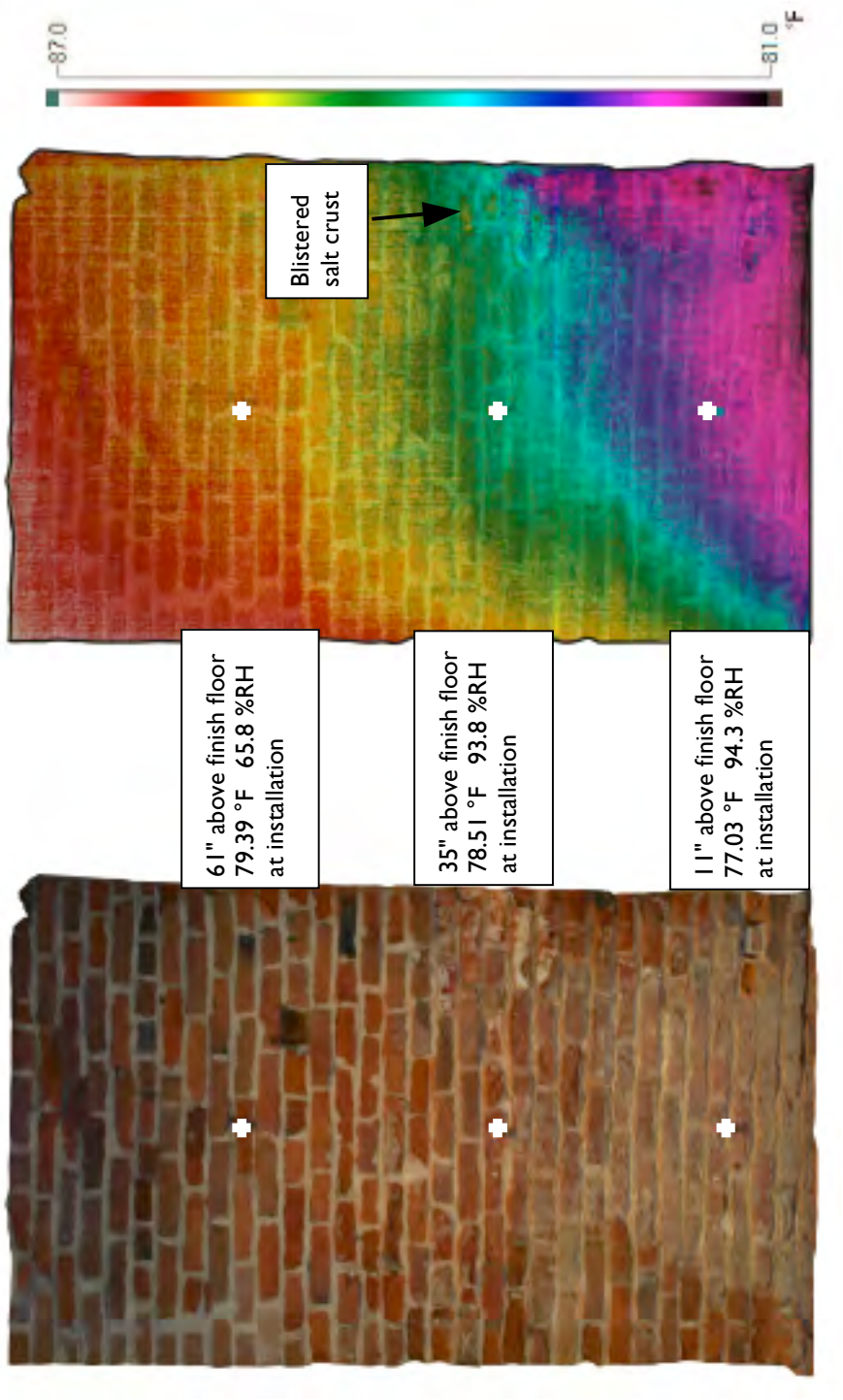


Figure 77. Conventional and infrared images of Wall 281-NE-4 immediately prior to installation of the sensors (by Cypress Building Conservation) with select sensor data (by M. Henry).

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Masonry

The deterioration of the brick masonry of Madame John's Legacy's ground floor level is ongoing and has occurred a long period time, most likely since the 19th century (although the lack of historic images from this period prevent us from having a full understanding of the masonry condition before the 1940s). The combination of the building's original highly permeable construction materials and their direct exposure to the salt-laden ground moisture and occasional partial flooding creates a "perfect storm" scenario that results in extensive damage to the masonry from long-term exposure to moisture and salts. The lack of effective downspouts and gutters also contributes to the masonry deterioration by providing an additional source of moisture (one that could potentially be controlled) beyond that which is being readily provided by the soil.

Previous alterations have also taken their toll on the masonry, by introducing potentially incompatible materials such as higher-fired brick and Portland-cement based mortar and stucco. These materials, which are harder and less permeable, can increase the moisture content and salt concentrations in the more porous historic materials by reducing drying rates at the surface. They also introduce yet another type of salt, sulfates, generally recognized as one of the most damaging to masonry. A similar phenomenon is occurring at the floor, installed in 1998 and consisting of a plastic sheet moisture barrier and a concrete subpavement. This impermeable plastic layer retards drying of soil moisture through the floor surface, increasing soil moisture content and re-directing soil moisture into the base of the historic brick walls. The absence of the vapor retarder and concrete subpavement would create a fundamentally damper interior environment that would still expose the walls to moisture, complicating salt movement in the walls.

The most destructive force currently affecting the walls is unquestionably the soluble salts. These salts, which have been documented in this study as being quite extensive and present in extremely high quantities within the wall assembly, damage the brick wall surface and subsurface. This damage is readily apparent on any wall surface of the ground floor, but it was also observed during the field investigation, when core samples fell part as they began to dry. In one of the core samples, a large portion of brick cleaved at a pre-existing fracture that was lined with salt, which had been in solution until the drying process began and the expansive crystals started to form. Observing such damage upon drying of the masonry on a small scale raises the concern for damage that could occur on a large scale should the wall be allowed to dry out while salts are still present in the wall.

The presence of multiple salt types impacts characteristics such as solubility and critical relative humidity, making it more difficult to predict their behavior and attribute specific conditions to specific salts. This lack of predictability, as well as variability of individual salt concentrations, prevents a full understanding of all of the forces at work in damaged masonry such as the brick walls at Madame John's Legacy. While it is clear that salts are the primary cause of the damage to

the walls, it is not clear which salts are the most damaging or if certain salts have a propensity for certain locations or specific materials.

The other piece of the puzzle that is not yet full understood, but is beginning to be, is the relationship between the walls, the salts and the environmental conditions. The environmental conditions, including interior temperature and relative humidity, as well as fluctuations in moisture content of the soil beneath the walls, has just begun to be monitored (as of August 2013). It is essential that the data generated from this monitoring program be collected over the course of the next four seasons (i.e. one year), so that an understanding can be developed of how the walls respond to what is happening in the soil and in the interior environment. This information will be important to consider when making decisions about how to ultimately treat the walls and what changes should be made to the interior environment and HVAC systems to aid in the long-term preservation of the walls.

Although this study provides a more thorough understanding of the causes of the masonry damage at Madame John's Legacy, as well as the specific conditions related to this damage, developing a solution to the damage is more challenging. While some recommendations can be made that will help to alleviate some of the causes of the deterioration, other possible solutions need to be carefully considered and vetted before any action is implemented. Therefore, the recommendations for the brick masonry presented in this report fall into two categories: *short-term* and *long-term*.

Short-term recommendations are for tasks that should be undertaken relatively soon in order to mitigate select causes of the masonry damage and to possibly reduce damage. Long-term recommendations relate to the development of possible physical interventions that maybe taken in the future to correct the existing damage to the walls. Given the complex nature of the deterioration mechanisms at play at Madame John's Legacy, these interventions require additional data and research to inform careful consideration before implementation.

Short-Term Recommendations:

1. Repair and maintain the roof and pavement water conduction system to eliminate additional sources of moisture. Unlike the ground moisture, roof and pavement surface water can be controlled with relative ease. In order for this secondary source of wall moisture to be minimized, the following steps should be taken:

- Repair gutters (patch holes and open seams) and clean on a regular basis to remove debris.
- Correct pitch of gutters to ensure proper drainage to leader heads/downspouts.
- Re-attach or provide new downspouts were detached from gutter.
- Remove bird nests from gutters and leader heads. Install bird proofing or bird deterrent to prevent return infestations.
- Re-point brick pavement and replace broken or missing brick, particularly adjacent to downspouts and in in-grade gutters.
- Install flexible tubing or splashboard where downspouts meet masonry to carry water away from base of walls. On the lake (northwest) elevation, this installation will have to be designed in a way as to not present a trip hazard.
- Repair catch basins at Dumaine Street end of alleys where in-grade gutters drain to storm drain to ensure rainwater is being effectively removed from the site. Clean out basins routinely.
- Clean out drains in foyer to make functional.
- Repair leaky hose spigot at south corner. Consider removing spigot and re-locating to another location not adjacent to ground floor masonry walls.
- Repair leaky faucet in utility sink in south cabinet/bathroom. Re-point masonry in this location (see *Short-Term Recommendation 2* below).

2. Perform a structural assessment of the ground floor masonry walls to evaluate capacity for supporting the live and dead loads of the building. The assessment should be carried out by a structural engineer who specializes in historic buildings and has an in-depth understanding of deteriorated historic building materials and their physical characteristics.

3. Continue the current program of not air-conditioning the ground floor spaces.

4. Continue the recently installed monitoring program for several months, preferably through four full seasons, and have conservation consultant review collected data quarterly. The current program monitors conditions in the room, air, walls and soil. Collection and analysis of this information will be critical to developing a more complete understanding of the deterioration mechanisms and possible mitigative strategies. The quarterly review of the data will also allow for any adjustments, as data is analyzed.

5. Continue infrared thermography of Wall 281-NE-4. Infrared scans should be made on a periodic basis, not less than every three months, and the images compiled so that the scans can be compared to the sensor data.

6. Remove all Portland cement-based repair materials (mortar and stucco) and replace with a feebly hydraulic Natural Hydraulic Lime (NHL 2.0) material. Removal of Portland cement-based materials will serve two purposes. It will eliminate the likely source of sulfate salts, although sulfate salts already in the masonry will remain behind. Replacing impermeable mortar with a more porous and permeable material, will create a favorable path for moisture and salts migration out of the wall, reducing the moisture evaporation at the brick surface. Although this mortar replacement strategy will not solve any of the current condition issues, it will mitigate one of the mechanisms of the masonry damage.

A mix such as 1 part NHL 2.0 to 2-3 parts masonry sand would be appropriate. The use of an NHL is recommended over a high-calcium (non-hydraulic) lime because of the damp condition of the walls. Because the walls are damp, carbonation of a non-hydraulic lime would be greatly delayed and perhaps prevented altogether. NHL mortars closely duplicate the characteristics of a non-hydraulic lime mortar but with the added benefit of having a hydraulic component that allows them to cure in the presence of moisture.

This work can be done in phases, as funding is available, and the first phase could serve as a mock-up or pilot project for evaluation purposes. Implementing the work in a phased manner would provide an opportunity for evaluation of the success of the new mortar and the identification of any negative results or side-effects. A wall that has already been well-documented through infrared thermography and investigative probes, such as wall 281-SE-1 or wall 282-NE-2 could be the location of such a pilot project. However, it should not be implemented in wall 281-NE-4 if the work is done in the next 12 months, as it would disrupt the current monitoring process.

Long-Term Recommendations:

1. Continue routine maintenance of buildings water conduction system and site drainage.

2. Work with a conservation consultant to establish the critical relative humidity points for the salts identified in this study (sodium nitrate, sodium chloride, potassium nitrate), as well as the sulfate salts identified in the GCI study. Determining this information will allow for a more exact understanding of the implications of moisture levels in the walls for salt phase change and volume change. Some salts, such as sodium sulfates, pose challenges to moisture management in saturated walls because they can be destructive in supersaturated solutions. This information should be related to the results of the current monitoring program, which documents interior environmental conditions (temperature and RH) as well as moisture levels in the wall.

3. Once data is gathered through the environmental monitoring and analyzed, consider potential treatment options for the walls. Treatment of the deteriorated brick walls would be a complex undertaking and all options should be thoroughly studied and evaluated before selecting a course of action. The implementation of mock-ups or pilot projects may be useful to help identify the best, most feasible and most preservation-oriented approach for the brick masonry.

Approaches and issues to be considered during this process include:

- Consider methods to stop the wicking of moisture from the ground into the walls (i.e. rising damp), such as the installation of some type of damp-proof course. This intervention must be carefully considered and thoroughly researched to fully understand its implications before implementing, particularly in terms of how it would impact the residual salts in solution in the brick masonry walls. Isolation of the wall from soil moisture can only be undertaken if it is implemented in tandem with other treatments that address the residual salts in the walls (see Recommendation 3 below). In other words, if the rising damp is halted through the installation of a damp-proof course and the walls (with salts in their current concentrations) begin to dry out, then intrawall brick damage on a large-scale could be experienced. This failure would be caused by the crystallization of salts that had previously been in solution, as moisture evaporates out of the wall. Since many of these salts are located inside the core of the wall and well beneath the surface of the brick, failures would occur deeper in the masonry, producing larger losses and spalls (as was experienced with the core sample removed as part of this study that fractured upon drying).

- Consider methods to remove salts from the walls. However, it does not make sense to consider removal of salts through methods such as poultices unless the *sources* of the salts are first eliminated. Because soil and soil moisture transported through the wall by rising damp have been identified as the primary source of the salts in the wall, elimination of the rising damp

would need to occur before (or in association with) removal of salts. This two-part treatment would have to be carefully choreographed so that the salts were extracted thoroughly and in a way that would not damage the masonry. Such a process might involve cycles of wetting of the walls with clean (deionized) water followed by periods drying and poultice applications. A mock-up of this approach (assuming a "stand alone" section of wall could be identified for this exercise) would be prudent. It would allow a better understanding of what such a treatment would entail, in terms of methods, materials and cost. It would also allow for evaluation of the treatment to assess its effectiveness. A mock-up such as this represents a discrete undertaking that could potentially be grant-funded and implemented in part by students to save cost.

5.2 Archaeological Investigation

Perhaps the most dramatic result of the present investigations in terms of the goals of the larger study that initiated fieldwork was the documentation of the extent of alterations to the interior stratigraphy since Shenkel's 1971 excavations. In Shenkel's Unit 7, he noted that the ground surface at the front of the structure was a very deteriorated herringbone pattern brick floor, although from historic photos of the ground level, this pattern was not characteristic of all interior rooms.[31] Whatever the case, there appears to be no trace of this earlier floor extant now, nor of the upper 30 to 40 cm (11.81 to 15.75 in) of fill beneath it. Shenkel notes a wood-lined drainage system directly beneath the prior floor, and it is possible that the renovation episode that resulted in the present floor (Context 1) was intentionally meant to remove this. In its place, a layer of clean sand fill was placed throughout the interior of the structure, followed by a layer of plastic sheeting. This sheeting was extended to the interior walls of the structure, where it typically lays directly against them. On top of this, a metal mesh frame and cement was placed, with the cement forming two distinct layers: loose unconsolidated mortar and a hard, dense slab, into which a herringbone pattern St. Joe brick floor was laid. Accounts from before this renovation episode cite the extent to which use had impacted the earlier floor and caused slumping towards the center of rooms, and the Context 1-6 construction was undoubtedly meant to rectify this. The resulting floor surface is very level, and the remnants of wooden stakes placed during its construction likely attest to the efforts made in this regard.

This construction effort, apparently dating to the 1990s, has undoubtedly impacted natural processes in the soils beneath Madame John's. The Context 6 sand layer is unusually dry for any subsurface soils in the New Orleans area, and, although the plastic moisture barrier is located above it, the entire Context 1-6 leveling episode would have influenced subsequent developments in the interior walls. It has also adversely affected the archaeological potential of the site as a whole. While late-nineteenth and early-twentieth century deposits may not represent the most unique aspects of the Madame John's site's history, it would appear that much of the archaeological record of the structure's interior use in this later period has been impacted. On the other hand, because soils in urban New Orleans are typically heavily inundated, it is difficult to assess the degree to which this has affected the moisture content of the soils beneath it. While Contexts 13, particularly Level 2, and Context 17 displayed some unusual qualities (in that they became much stickier and wetter in the screen that they appeared to be in situ), this probably relates more to the amount of burned and carbonized material within them than to the overlying stratigraphy.

As noted by Dawdy, there has been a great deal of speculation regarding the architectural history of the extant Madame John's Legacy building.[32] Maps dating as early as the 1731 Gonichon map of

[31] Shenkel, 46.
[32] Dawdy (1998), 26.

New Orleans depict a structure broadly matching the size and location of the existing building. (*Figure 3*) That this structure was at least partially destroyed by the 1788 New Orleans fire has been indicated by a building contract between Manuel Lanzos, owner at the time of the fire, and an American builder using materials "salvaged from his burned houses".[33] The wording of this contract (along with some sources that suggest the fire did not entirely level this block) has left open the possibility that portions of the foundations for the original French Colonial-era structure may have been re-used, even to the extent of being built directly into the existing building. Dawdy, based upon her investigations in the courtyard, suggests that the earlier building was not a complete loss, and that "walls were probably left standing and may have even been incorporated into the 1788 Robert Jones reconstruction".[34] However, she leaves the reservation that only much larger-scale excavations examining wall trenches around the building could ultimately resolve this question.

The present investigations, though limited in extent, may provide some architectural evidence that sheds some additional light on this question. At this point, pending full analysis of the recovered material from the excavation, the suggestions here are tentative, and a more extensive discussion of this issue will be provided in the final report of investigations. The stratigraphy in Units A and B is broadly comparable, in that, for instance, both provided extensive evidence of the 1788 fire, both in debris and in a carbon-rich ashy lens likely representing the event itself. However, small variations in the construction of the lower levels of the foundation wall of the Madame John's structure, and in its relationship to the observed soil layers, may offer some clues to portions of the building that survived the 1788 fire more intact than others.

[33] Cited in Dawdy 1998 and Wilson 1987:338.
[34] Dawdy (1998), 122.



Figure 78. Foundation of front wall (Context 33) at Madame John's Legacy showing step outwards in Unit B (facing north).



Figure 79. Foundation of rear wall (Context 16) at Madame John's Legacy. Note less prominent step outwards and wooden feature (Context 24) in levels beneath the footing.

In Unit A, the layer of carbonized material and ash associated with the 1788 fire (Context 18) abuts directly with the lowest courses of the brick wall, as do the various layers of fire-related debris (Context 12, 13, and 17) and the apparent compact surface from just after the fire (Context 10). Contrary to expectations if the rear foundation of the extant structure had been built at this time, there is no evidence of a construction trench in profile. On the other hand, while it was scarcely visible during excavation, a construction trench is clearly visible in the east wall of Unit B. The loose fill of Context 19 cuts through Contexts 21 and 22, a layer of brick rubble (debris likely spread after the fire) and the carbon and ash-stained layer beneath it. The interface between these three layers remains somewhat irregular in profile, and there is some possibility that the bottom course of the brick wall exposed in Unit B (Context 33) may be original to the pre-fire structure on the lot, with the most badly damaged portions of the wall repaired and patched in an irregular fashion.

That this is the case is further suggested by differences in the brickwork in the walls (*Figures 78-79*). The single step outwards of the Madame John's foundation was noted by Shenkel in his prior work at the site. It was noted during the present investigations that this step out differed by about 5 cm (1.97 in) between the foundations exposed in Unit A (Context 16) and Unit B (Context 33). In other words, the lip formed by the Unit A step extends to the north 3 cm (1.18 in), while that formed in Unit B extends to the south a full 8 cm (3.15 in), much closer to a whole brick in width. Furthermore, it was noted during profile drawing that two distinct lengths of brick comprised the walls. Although the brick bond at Madame John's is not very consistent even within a single wall, it was noted that all of the stretcher-laid brick in the subsurface portion of the Context 16 wall measure 20.5 cm (8.07 in) in length. However, the subsurface portion of Context 33 (the north wall) is comprised predominantly of brick that, when exposed as stretchers, measure 22 cm (8.66 in) in length. Occasional bricks of the 20.5 cm length are incorporated into this wall as well, and the shorter bricks are the only ones found in the possible earlier (bottommost) course of this wall. While the brick collected during excavation will need to be analyzed to further test this theory, it is possible that this small difference in stretcher brick size may be a quick way to assess areas of the structure that were extensively repaired and/or rebuilt in the 1788 construction. Of course, since it is known that materials were re-used in this effort, the presence of the shorter, presumably earlier brick is not sufficient by itself to allow association with the earlier structure.

As discussed above, even though the archaeological record within the structure at Madame John's has been previously impacted, the limited excavations undertaken as part of these investigations have demonstrated that rich deposits dating primarily to the eighteenth century are preserved in at least portions of the interior. The greatest part of this material is associated with the period of the 1788 fire or earlier. While a detailed assessment of the results of the present investigations must await analyses of artifacts and of special samples, a few particular areas for further research are already apparent.

In each unit, possible structural features associated with the French Colonial period were uncovered. In Unit A, remains potentially representing a post-in-ground or post-on-sill structure were located near the interface with sterile subsoil. These extended underneath the present wall foundation to the south, potentially linking them to similar deposits documented by Shenkel to the southwest of the present unit. While results were inconclusive as to whether the possible posts (and the potential trench in which they were located) were actually structural, a layer of brick resting on subsoil (Context 23) formed a surface that likely predates the structure shown on the 1731 Gonichon map. (*Figure 3*) Even more intriguing in this regard is the possible plank wall (Context 30/31) located in Unit B near the interface with the subsoil. While this could be the remains of a historic fence line (or even just a particularly linear relict root, rodent, or crawfish hole), the fact that it skews slightly from the existing street grid is suggestive of the archaeological signature of some of the early palmetto huts utilized by colonists while land was being cleared for the establishment of the city. Such construction has a parallel in the possible palmetto hut excavated as part of the St. Anthony's Garden Project at St. Louis Cathedral. During this project, a similar linear alignment of decomposed wood not matching the existing street grid, with a narrow associated wall trench, was excavated. However, in this case, the larger excavation unit size allowed for a sufficient length of the wall to be exposed that square hewn wooden posts, including a large corner post, were also recorded. At the time, this was interpreted as one of the earliest structures excavated to date in New Orleans. Further delineation of the Context 30/31 feature in Unit B could potentially suggest comparable dates for its construction, although this interpretation must be taken with caution unless more is exposed.

Likewise, the 1788 fire levels at the site also suggest some unique research issues regarding the distribution of activities within the eighteenth century household. If the interpretation tentatively suggested here is correct, and the material deposited in Unit A represents objects stored in the ground floor of the initial Madame John's structure in situ, the distribution of material could be indicative of specialized activities throughout the ground floor area. Already, the concentration of olive jar fragments and other specialized ceramic types in Unit A (*Figures 80-81*) may suggest distinct functions of this room historically. Of course, other unique items throughout these deposits, like the 1722 9-denier coin mentioned above, also provide a great deal of information about social life and the circulation of objects in the Spanish Colonial period. Additional interpretations of artifacts and their applicability to research issues involving foodways, ethnicity, and daily life are under preparation. Once flotation samples and fine samples are washed and processed, and that additional artifacts are examined in detail, it is expected that these interpretations can be refined and expanded considerably. Dawdy's previous work has provided a number of rewarding anthropological research issues through which to interpret the material recovered, particularly in conjunction with the detailed historical background that has been previously elaborated.[35]

[35] Dawdy (1998) and Dawdy (2008).

While no further subsurface investigations are planned at the present time, it is clear that archaeological remains underneath Madame John's continue to maintain integrity and research potential, and that these deposits continue to be eligible for inclusion in the National Register of Historic Places under Criterion D. Should renovations or alterations of the interior necessitate removal of the existing brickwork and slab, the sand fill associated with their installation may be considered as providing a buffer protecting these deposits. However, any such effort would also provide a unique opportunity for more extensive investigations into the use of the structure's interior space during the Spanish Colonial era. In addition, because the building itself has protected some of the earlier French Colonial deposits preserved beneath it, these deeply buried strata would provide additional unique research opportunities.



Figure 80. Fragments of olive jars from Unit A, Context 13, Level 2 (58-63 cmbd).

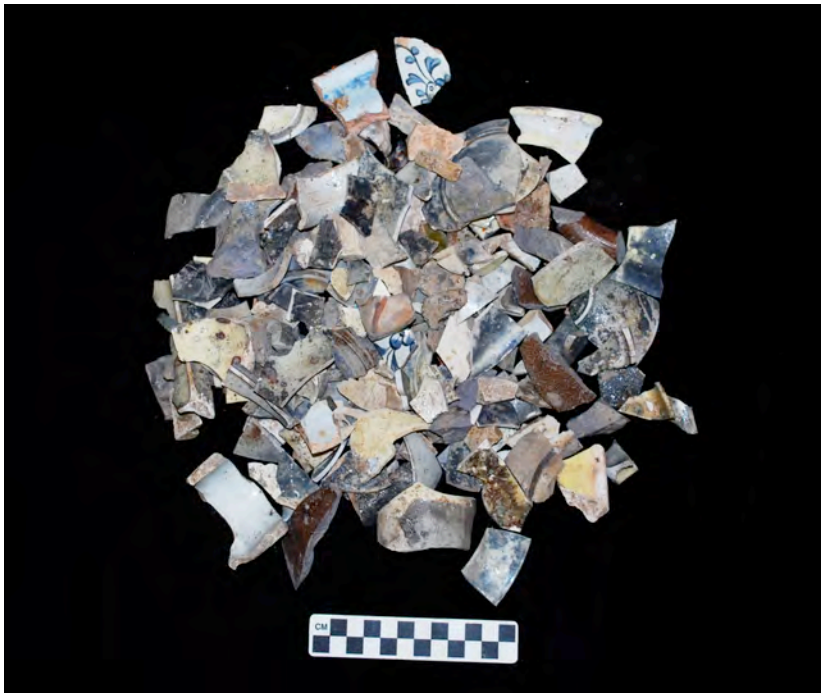


Figure 81. Burned creamware, faience, and Rhenish stoneware from Unit A, Context 13, Level 2 (58-63 cmbd).

5.3 Paint Finishes

BCA's analysis of the existing finishes at Madame John's Legacy basically confirms those of the 1983 Fore report, with some slight variations in interpretation. While the Fore analysis lists the earliest existing finish on the wooden elements of the front and rear galleries to be a "medium green-yellow" most closely matching Munsell 2.5Y 5/2, BCA's analysis indicates that the earliest existing color was a gray with olive tones, most closely matching Munsell 5Y 4/1. These two greenish tones are somewhat close in appearance, however BCA has found that the color is more blue than yellow and much more neutral than the green indicated in Fore's findings. It should be noted that the building's current green paint is brighter and more yellow even than the Fore color, and does not represent an accurate interpretation of the historic color.

BCA has confirmed that the earliest existing finish on the lakeside clapboards is a medium red. It is not believed, however, that the red finish was in place at the same time as the green finish, as it is interpreted today. The red finish appears as the first two campaigns on the lakeside clapboard, the third campaign is the gray seen on the other clapboards on the building. Additionally, BCA noted trace evidence of a cream-colored finish below the gray on the ceiling boards and joists of the galleries. This suggests that the clapboards on the galleries were added sometime after construction, and that the red boards on the lakeside elevation, as well as the ceiling boards and joists of the galleries, were painted gray to match the newly installed gallery clapboards. It is likely that during the time of original construction it was thought that the sheltered walls of the galleries wouldn't need the added protection of the clapboards and so they were installed only on the exposed side. Later, when it was found that the exposed masonry walls were not as weather tight as expected, the clapboards were added.

These findings represent two early paint schemes, which likely date to the 19th Century. The earliest would have been whitewashed, stuccoed brick at the front of the building, with red clapboards at the sides, and bare brick in the rear. The ceilings at both galleries were cream-colored. The next campaign would include the green-gray clapboards at the front, rear and side elevations, with ceilings painted to match. While BCA was not able to identify the corresponding color of the door or window frames and shutters for either, Fore's analysis suggests that they may have been painted gray-green to match the clapboard at the time of the second campaign. No evidence exists to suggest the finish of these elements at the time when the masonry walls were exposed.

The color matches for the identified early finishes are provided on the following page. Specific color matches have been made both to the Munsell system and the Benjamin Moore paint palette. Please note that only the actual color chip or notation should be used for paint replication purposes as the digital representation of these swatches distorts the true color. Additionally, it should be noted that the amount of the early cream color found in paint samples was insufficient for color matching

purposes. The color match for the cream is included only as an approximation for general reference.

Color Matches of Earliest Existing Finishes Documented for Madame John's Legacy

Earliest Existing Finish Documented on front gallery rafters, rear gallery ceiling boards and ceiling joists	Munsell 10YR 9/1	Benjamin Moore OC-87
Earliest Existing Finish Documented on clapboards of lakeside elevation	Munsell 7.5R 3/4	Benjamin Moore 1302
Earliest Existing Unified Finish Documented on front and rear gallery clapboards, lakeside clapboards (third campaign), rear gallery ceiling boards and joists (second campaign), front gallery rafter (second campaign)	Munsell 5Y 4/1	Benjamin Moore 1477

Appendix A.

Finding Aid for Archival Information

Historical Images

(R. Jackson)

Madame John's Legacy Collection

Louisiana State Museum
April 2013

Descriptive Summary

Provenance: Donated by Mrs. Stella Lemann in 1947
Title: Madame John's Legacy Collection
Dates: 1947 - 2012
Abstract: Collection of items concerning the history, ownership, restorations, et al. of the French Quarter complex known as Madame John's Legacy
Extent: 100+ folders
Accession: Site acquired by LSM in 1947 (no accession number)

Biographical / Historical Note

The house at 632 Dumaine Street, known as "Madame John's Legacy," is one of the oldest existing buildings in New Orleans and is an excellent representation of the French colonial architectural style that was once more prevalent in the city. While the current structure most likely dates to 1788, it is believed to have been rebuilt from an earlier structure which burned but had stood on the site since the 1720s. A great number of owners have stewarded the property over the years, most recently the Louisiana State Museum, to which it was donated by Mrs. Stella Lemann in 1947. The house and its grounds remain a key property in the Museum's French Quarter holdings.

Scope and Content

The Madame John's Legacy Collection is large and spread out over various institutions and physical locations. Blueprints and architectural plans can be found at the Louisiana Historical Center in the Old U.S. Mint as well as the offices of the local firm Koch & Wilson. Maps and specifications can also be found at the Mint. The Collections facility of the Louisiana State Museum houses a more informal group of material, largely made up of copies of reports, photographs, renderings, articles, minutes, and other related material stored in file boxes. Outside of the State Museum, the Southeastern Architectural Archive at Tulane University also holds renderings, letters, articles, and correspondence. Likewise the Historic New Orleans Collection has a great deal of original photographs.

Access of Use Restrictions

Access

Collection is **open** for research

Administrative Information

Preferred Citation

Madame John's Legacy Collection, Louisiana State Museum

Acquisition Information

Site donated by Mrs. Stella Lemann in 1947
Collection items acquired at various times

LSM Collections Facility, 1000 Chartres St.
Building code 11-2-424

Mr. Lambousy's office files (headings & descriptions)

Archaeology
- Portions of Shenkel report (1972) and Dawdy report (1998)
- Diagrams of on-site excavations; list of objects found

"Hartman" (artist who lived & worked at MJL in 1930s)
- Correspondence & description of time there

"Mangelsdorf" (artist/sculptor who lived & worked at MJL in 1930s)
- Correspondence, articles, receipts, etc.

Bricks/brick deterioration
- Koch & Wilson building contract (1948)
- Farneth site report (2007)
- Final Getty report (2008)
- Robert Cangelosi letter (2011) re: recommendations for MJL
- Various magazines, newsletters, and articles re: Getty project

MJL Revisited – Shannon Dawdy
- Copy of '98 report (excellent resource for historical & archeological info)

History
- Cable's "'Tite Poulette" story
- Various newspaper & magazine articles from mid-late 20th century

Images
- copies from early 20th century to modern, with attached articles

Cultural Vistas
- "Cultural Vistas" magazine (2004) with MJL article, other Louisiana features
- Copies of articles w/ related correspondence

"Hobbs" (artist who lived & worked at MJL in 1930s)
- Correspondence, articles, receipts, etc.

"Kinsey" (artist who lived & worked at MJL in 1930s)
- Correspondence, articles, receipts, etc.

"Lemann"
- Materials related to Stella Lemann, her family, ownership of MJL since 1925 & donation of it in 1947

Newspaper & magazine articles/clippings
- Large collection from early – late 20th century
- Various topics focusing on either history or renovations of MJL

Cases
- drawings of display case dimensions for exhibits

Exhibit script
- For MJL exhibits interpretation

Finishes report
- Copy of 1983 paint analysis report on MJL interior & exterior

Framed objects, folk art
- Exhibit list of exhibits that have been featured in MJL

Furniture

- Copy of 1819 Seghers inventory of house featuring a great deal of furniture

Hartman, Sam
- Copies of "Hartman" file above

Labels
- Correspondence & lists from 1972 Shenkel excavation

Opening building in morning
- Security instructions

Lighting
- Cost tables & logistical information

"Repros. tixt."
- Invoices & receipts from Bevolo lighting

Repros. Photos
- Correspondence related to tours & Arkansas portrait (see file)

Roof
- Photos & correspondence relating to roof removal & replacement (2002)

WPA
- Copies of various articles, some WPA-era & some more modern

<u>LSM building files (headings & descriptions)</u>

Floor & Room plans
- Koch blueprints for brick drain addition, original & copies (1948)
- Various site plans & exhibit layout from first era of acquisition
- Black & white copies of early 20th century photos

Title search
- Info on ownership history & detailed chain of title

Exhibition (from 1970s)

Spanish Week 1977 – "Rev. of 1768"
- Exhibit information
-

Duplicates
- Ownership history
- Copies of original notarial documents

Photos
- Ranging from 1940s – 1980s
- Black & white; interior & exterior; originals & copies

Finishes analysis
- Copy of report

Labels (for display)
- Exhibit information

Notarial records

Succession documents
- Copies from all eras (18th – 19th centuries)

Info regarding past owners
- ownership duplicates

Research
- same ownership info

Real-Pascal-Marin families
Lanzos family
Seghers family
Beluche family
Diary of Captain Philip Buckner
- plus general history

Negatives & slides
- From 1975 reopening and 1983 structural work

MJL 1994 HABS (Gene Cizek & Tulane)
Receipts & court documents in contemporary life
- Copies of newspapers (articles & ads) from 1800s-1820s

Pharmaceutical article
Original Laura Porteus papers (to Mrs. Lemann)
- Original correspondence detailing early research on property history & chain of title by Porteus for Lemann
- Articles & exhibit material pertaining to original exhibitions (1940s-70s)

Louisiana Historical Center in Old U.S. Mint, 400 Esplanade Ave.
Building code 03-3-263

Blueprints
MJL-1 – HABS drawings, 1963
MJL-17 – N-Y Associates Repair & Renovations, 1997
MJL-18 – same as above
MJL-19 – Internal Repairs, William Brockaway, 1982
MJL-21 – F. Monroe Labouisse, Jr. Restoration, 1972
MJL-23 – same as above
MJL-24 – Electrical & mechanical, 1972
MJL-25 – HABS drawings, 1963
MJL-26 – N-Y Associates, revised sheets 11/19/1997
MJL-27 – N-Y Associates specs, 12/1996

Range 73, unit 4, shelf F ("Madame John's Legacy & Lower Pontalba")
Set of ten (10) black & white HABS photograhps by Lester Jones, 1940, showing MJL exterior, courtyard, and attic
Building specs for Restoration of MJL by F. Monroe Labouisse, Jr. – May 1, 1972 (bound)
"MJL Xeroxed Copies"

- Xeroxed copy of above specs in loose sheets
- Correspondence from U.S. Dept. of Interior (June 1970) to Louisiana Governor regarding acceptance to Natl. Historic Landmarks registry & installation of plaque
- General correspondence 1970-71 re: financing MJL restoration
- Three (3) black & white photos of MJL exterior in 1971, pre-restoration

"Architectural contract for MJL – Labouisse"

- Correspondence & contract re: payment & stipulations – Feb. 1972

"MJL bid proposals"

- Contractor bidding documents – May 1972

"Contract – correspondence MJL"

- Re: ethics decision on architects George Leake & Sam Wilson, Jr. (LSM board members at that time) – denied the opportunity to restore MJL on conflict of interests grounds

Duplicate copies of all above documents

Southeastern Architectural Archives, 6801 Freret St.
Tulane University, Jones Hall rm. 300

"May 17, 1972 Contract between Stephen J Benton, Frank Monroe Labouisse, Jos J Quantana, consulting engineers"
"Madame John's Legacy Addendum #3, unresolved items", 8-17-72, from F. Monroe Labouisse, Jr.
Times Pic, 7-17-71, "DeLaHoussaye Attacks contract for Mint Work"
Times Pic,7-10-72, "Benton is awarded Madame John's Legacy Restoration"
Times Pic, 6-17-12, "Legacy Bid Rejection Expected."
"Addendum #1 to Specification for Restoration as Madame John's Legacy" 5-17-72
"Addendum #2 to Specification for Restoration as Madame John's Legacy" 5-26-72
"Letter from Henry Krotzer to Peggy Richard's re: interior furnishings" 2-21-72
"Letter from Samuel Wilson to Monroe Labouisse re:proposal to be architectural consultants" 2-9-72
"Letter from Monroe LaBouisse to Koch & Wilson re:proposal to be architectural consultants" 2-17-72
""Letter from Henry Krotzer at Koch & Wilson to Star Sprinkler Co re: sprinklers" 8-5-71
"Cost estimates from Koch and Wilson to Peggy Richards" 12-14-71
"Cost estimates from Koch and Wilson to George Leake" 12-14-71
"LA State Museum Archaelogical Study" 8-6-71
"Letter from Samuel Wilson at Koch & Wilson to George Leake re:rejection of contract" 7-27-71
"Letter from Leake to Wilson re:contract" 7-16-71
"AIA document/standard form of agreement between owner and architect" 7-71
"Letter from Wilson to Mel Leavitt @WDSU re:article in Clarion Herald" undated
"Madame John, her Legacy is Intact" Clarion Herald article by Mel Leavitt
Times Pic, "Work on Legacy to LaBouisse" 9-21-71
"Letter from Wilson to LA State Museum re:use of Madame John's" 6-21-71
"Letter from Wilson to Mary Lou Christovich re:original building materials" 6-18-70
"Letter from Edward F. Breton to Mrs. John Maynard re: financing" 8-27-69
13 additional letters from the 60's from or to the state and Gov. McKiethen regarding money

*list compiled by Yvette Tyler

FINDING AID FOR MADAME JOHN'S LEGACY MATERIALS
THNOC, Williams Research Center, 410 Chartres Street

In binder for Square 47:

- complete notarial list for square 47, lot 18532 (632 Dumaine St)
- Negatives of photographs by Jerry Toler, 1979, for Vieux Carre Survey (mainly showing interiors, windows, doorways, railings, roof lines, & details – 108 photos total)
- Copy of 1885-1890 engraving from "Cable's romances" depicting exterior
- Various copies of exterior historic photographs from turn of the century to 1980s (most in LSM collection already)
- 5-pg. History written by Edith Long, Oct. 1964, largely concerning succession
- Dozens of newspaper articles from roughly 1964-1975 documenting the saga of securing funds & support to restore MJL, which had been shuttered by Betsy and remained closed until 1972 (LSM quoted as saying the building was "literally falling apart")
- HABS sets from 1963 & 1994
- "Building contract between Roberto Jones and Manuel de Lanzos, 1788 April 1, Pedro Pedesclaux notary" – English transcription of Spanish original, housed at City of New Orleans Notarial Archives
- 3 photographs from Richard Koch's collection showing exterior, French door on front gallery & fireplace on main level (all early 1940s, pre-restoration)

*The Collins C. Diboll Vieux Carre Survey, found in its entirety online at (http://www.hnoc.org/vcs), also features all photographs, depictions, and maps for Madame John's Legacy in THNOC's collection, with all pertinent citations



EL2007.1.033 (LSM accession #)
Painting by A.B. Cruise, btw. 1937-40



EL2007.1.058 (LSM accession #)
Painting by A.B. Cruise, btw. 1937-40



fja00073 (LSM accession #1981.132.073)
Photograph by F.B. Johnston, late 30s/early 40s



fja00076 (LSM accession #1981.132.076)
Photograph by F.B. Johnston, late 30s/early 40s



jna00450 (LSM accession #T0405.1992.1)
Photograph by J. Teunisson (late 19th/early 20th cent.)



jna00451 (LSM accession #T0405.1992.2)
Photograph by J. Teunisson (late 19th/early 20th cent.)



M101.13 (LSM accession #)
Painting by A. Kinsey, c. 1935



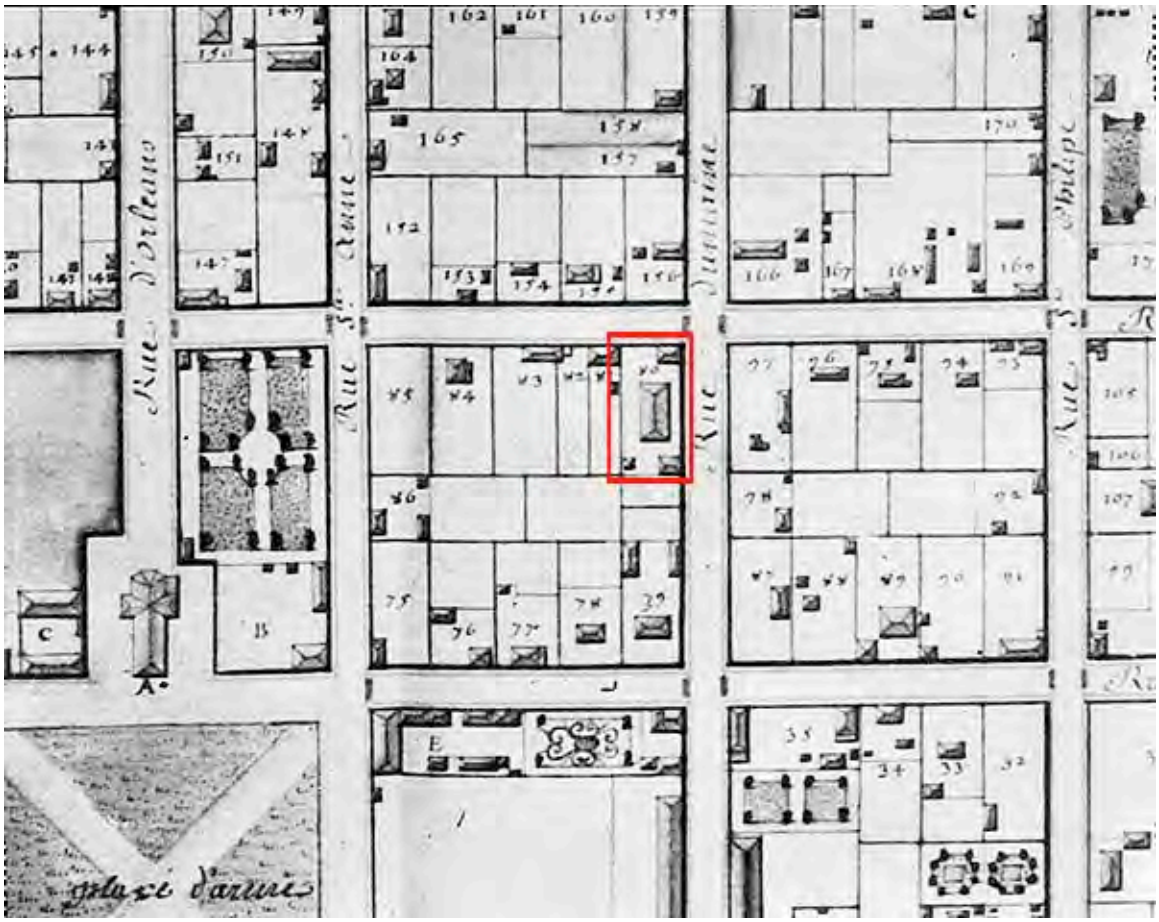
MJL exterior
Photographs from HABS documentation, c. 1940



MJL exterior 2
Photographs from HABS documentation, c. 1940



MJL rear porch detail
Photographs from HABS documentation, c. 1940



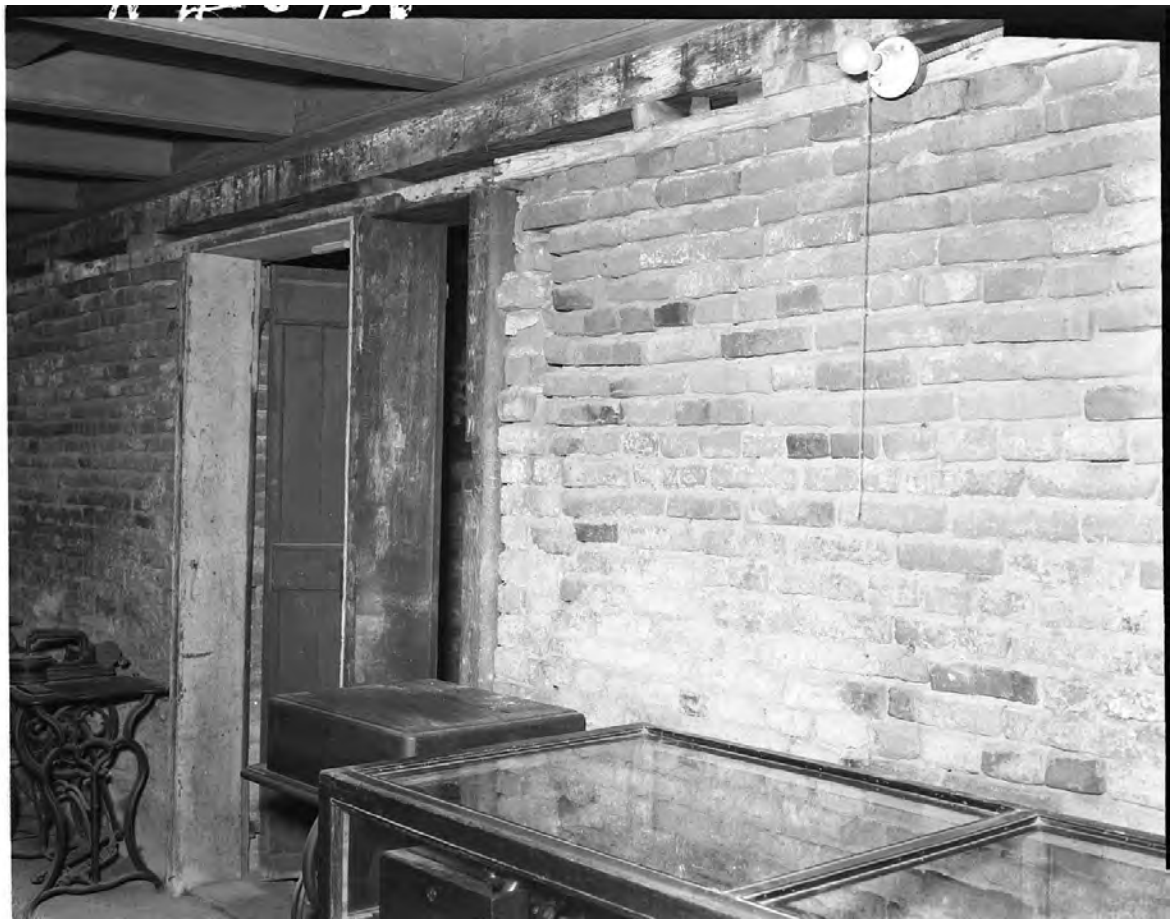
Plan of City 1731
From Gonichon's 1731 map (MJL location highlighted in red)



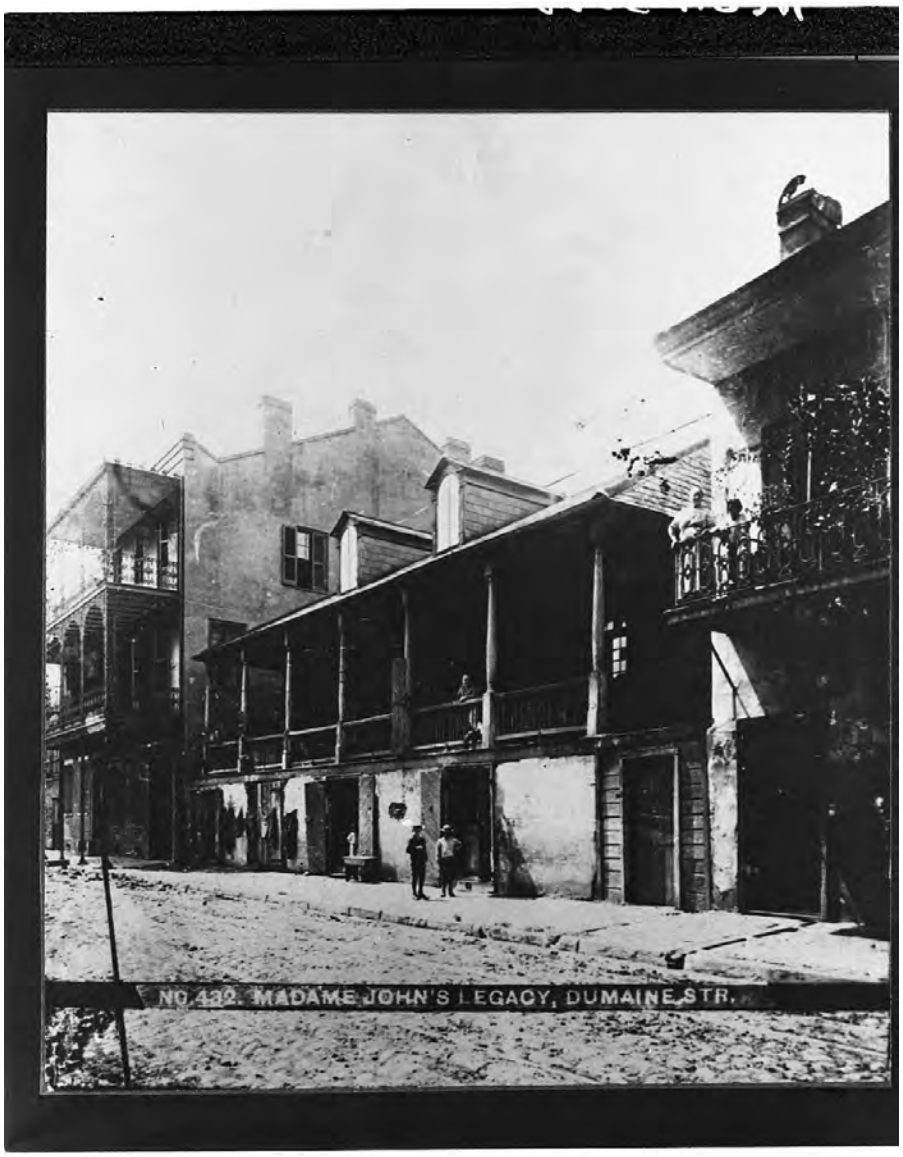
MJLPre009, MJLPre010
Photograph by unknown, post-1947 restoration
LSM collection (G. Lambousy files)



MJL029
Photograph by unknown from c. 1940 showing basement foyer
LSM collection (G. Lambousy files)



MJL030
Photograph by unknown from c. 1940 showing basement foyer
LSM collection (G. Lambousy files)



MJL028
Photograph by George F. Mugnier, late 19th cent.
LSM collection (G. Lambousy files)



4844a
Photograph by unknown, late 1940s/early 1950s
LSM collection (G. Lambousy files)



4844b
Photograph by unknown, late 1940s/early 1950s
LSM collection (G. Lambousy files)



5054 Photograph by unknown, late 1940s/early 1950s – showing courtyard, exterior
LSM collection (G. Lambousy files)



5090 Photograph by unknown, late 1940s/early 1950s – showing exterior
LSM collection (G. Lambousy files)



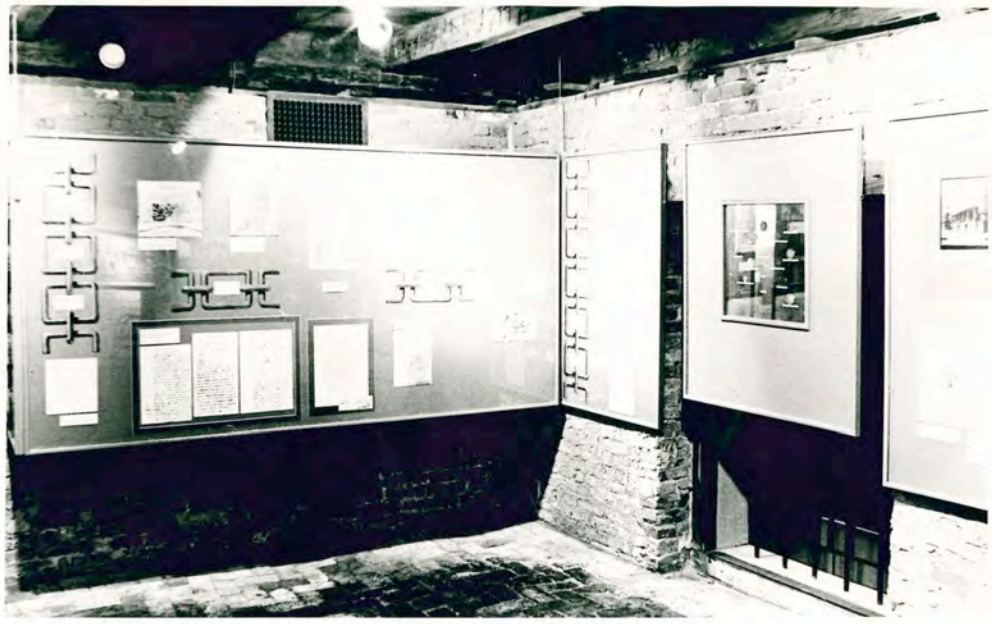
5138 Photograph by unknown, late 1940s/early 1950s – showing exterior
LSM collection (G. Lambousy files)



5141 Photograph by unknown, late 1940s/early 1950s – showing basement
LSM collection (G. Lambousy files)



5529 Photograph by unknown, late 1920s – showing exterior and street
LSM collection (G. Lambousy files)



MJL basement displays, post 1972-renovation
(LSM Collections, 1000 Chartres Street)



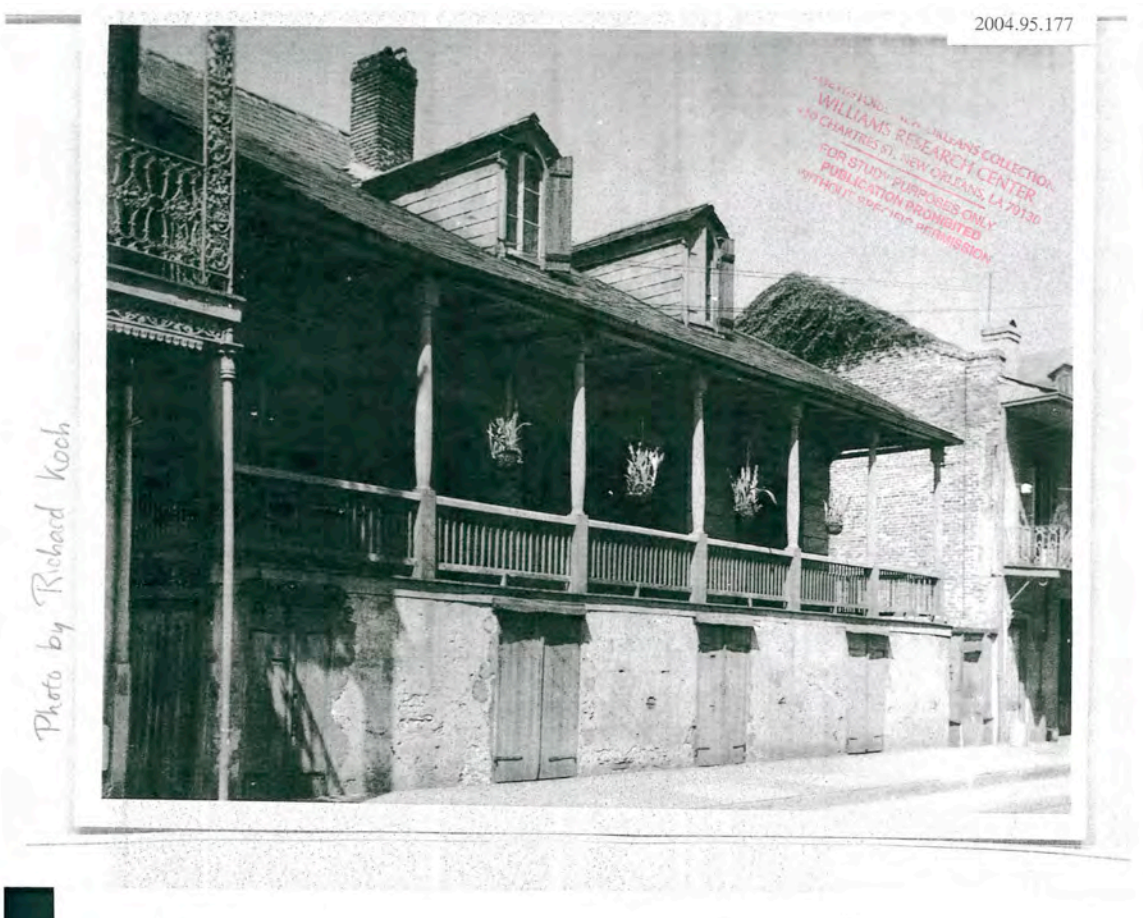
MJL exterior, late 1960s, while shuttered post-Betsy, pre-1972 renovation (LSM Collections, 1000 Chartres Street)



MJL post 1972 renovation, reopened to public, late 1970s
(LSM Collections, 1000 Chartres Street)



MJL early 1980s (LSM Collections, 1000 Chartres Street)



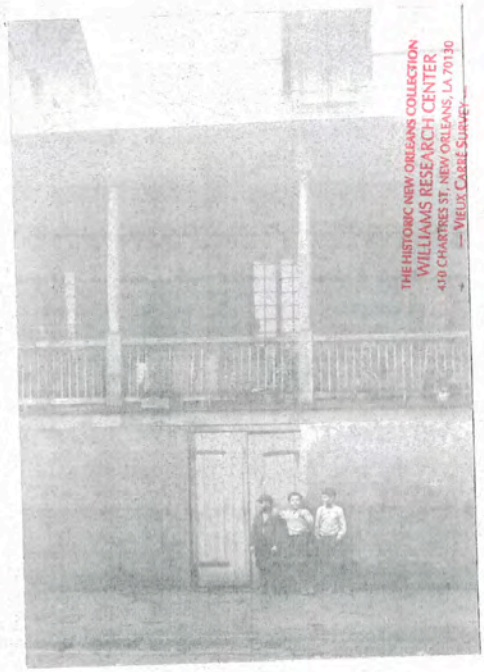
2004.95.177 (LSM accession #)
Photographs by Richard Koch, early 1940s
(THNOC)



2004.95.194 (LSM accession #)
Photograph by Richard Koch, early 1940s
(THNOC)

628 - 632 DUMAINE STREET

SQUARE NO. 47



NOT INCLUDED IN MICROFILM PROJECT OF MAY 1966

THE HISTORIC NEW ORLEANS COLLECTION
WILLIAMS RESEARCH CENTER
410 CHARTRES ST. NEW ORLEANS, LA 70130
— VIEUX CARRE SURVEY —

Photographed by Will H. Moses in 1917

Gift of Mrs. Emilio Levy
May 20, 1968

1917 photograph by Will H. Moses, gifted to THNOC in 1968. Vieux Carre Survey.

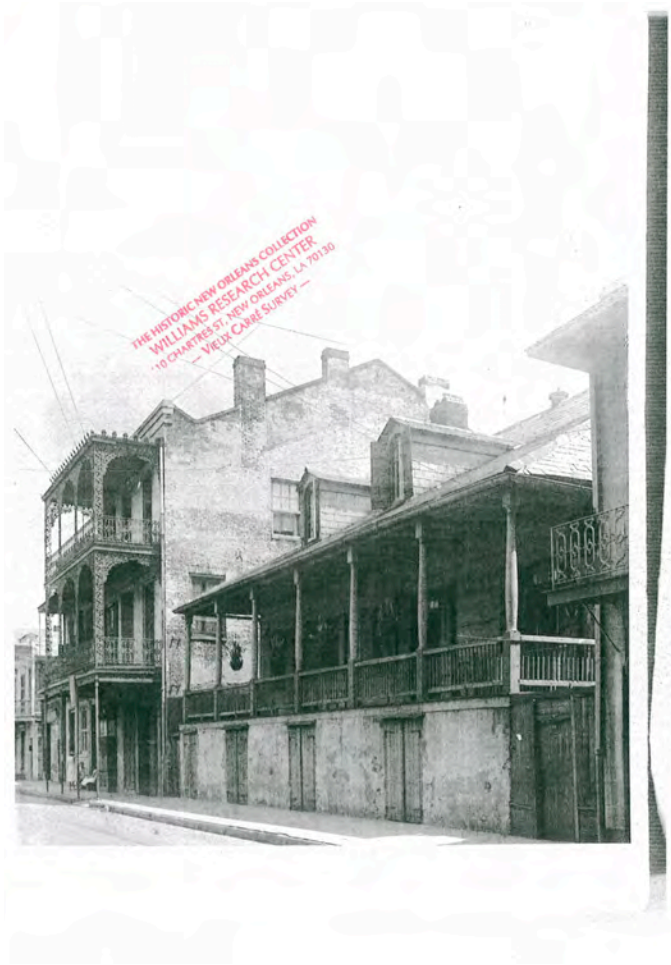
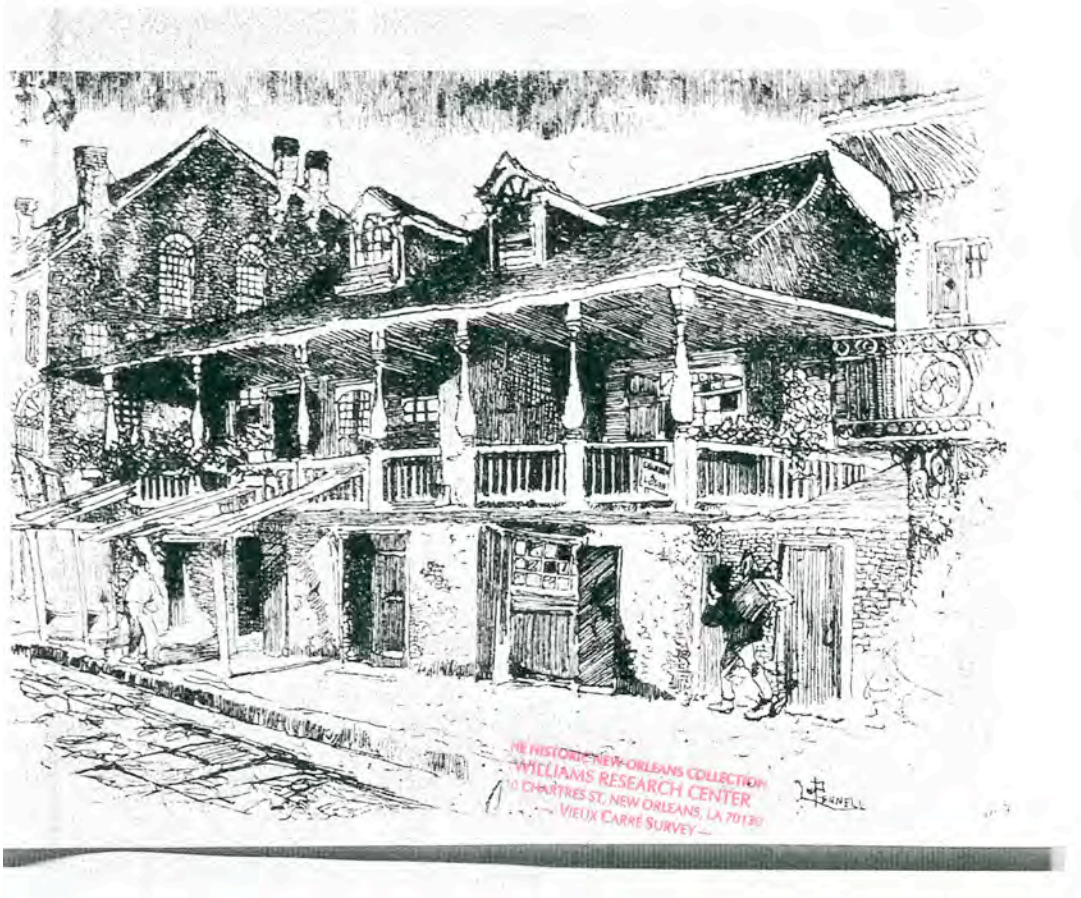


Image from late 1930s/early 40s, unknown photographer. Vieux Carre Survey.



Official LSM photograph from post 1948-restoration (late 40s/early 50s). Vieux Carre Survey.



Engraving by Pennell from 1885/90 for use in “Cable’s romances”, accompanying “Tite Poulette” story. Vieux Carre Survey.

THE HISTORIC NEW ORLEANS COLLECTION
WILLIAMS RESEARCH CENTER
410 CHARTRES ST, NEW ORLEANS, LA 70130
— VIEUX CARRÉ SURVEY —

SQUARE 47

LOT NO. 18532-01

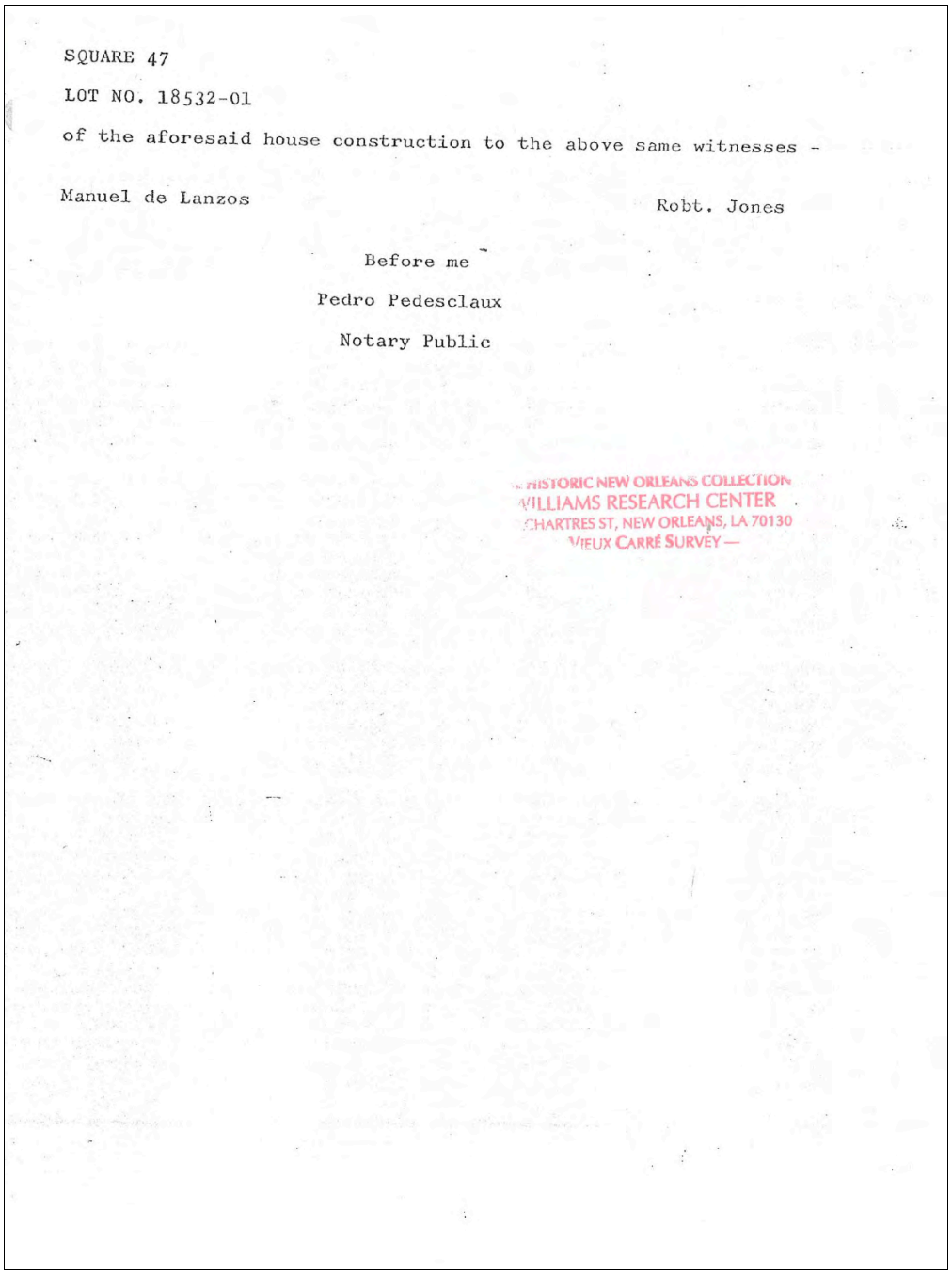
BUILDING CONTRACT BETWEEN ROBERTO JONES AND MANUEL DE LANZOS

Date	Notary
1788 April 1	F. Rodriguez P. Pedesclaux 2/427

CONTRACT / In the city of New Orleans the first of April of the year One Thousand Seven Hundred Eighty Eight before me the notary and undersigned witnesses appeared Robert Jones master carpenter whom I certify that I know and said that he obligated himself to construct in the space of six months counting from this date on the land of Don Manuel de Lanzos Captain in the Fixed Regiment of this place a house of fifty feet front and of thirty-two feet and four inches of width and a gallery in the rear of said house nine feet in width and of the same length as the house and at each end of said gallery a brick vault six feet wide and over said vaults a cabinet which house constructed in front on a brick wall fifteen inches high and on the two sides and rear on brick pillars equally fifteen inches high said houses (sic) in six apartments without including the cabinets in bricks between timbers and line the front of said house and the two sides covered with ship-siding and with one double chimney and two single ones the whole being with keys and bolts with its doors and windows: Equally in the courtyard of said land a kitchen of twenty-eight feet in length and fourteen of width with one double chimney said kitchen on brick pillars one foot high with one double chimney divided in two parts one boarded and the other without board; likewise in the couryard of said land a common place the whole conforming to the plan which the grantors have made before me the present Notary which remains deposited in my Public Office which houses kitchen and common place the said Don Roberto Jones to construct for the amount of three thousand pesos of which he has received two thousand pesos cash of which amount he acknowledges delivery of his own volition and because of the delivery not being made here and now he renounces the Exception concerning counted cash and grants formal receipt; and the one thousand pesos remaining which the said Don Manuel de Lanzos obligates himself to pay to the said Don Roberto Jones within six months of the date of this document the aforesaid Don Manuel de Lanzos Said: that he accepts it in his favor and obligates himself to give him all the bricks which the said Jones would need for these works; also all the ironwork which he has salvaged from his burned houses; to the completion of the said contract both grantors obligate their goods possessed and to be possessed They acknowledge here as inserted the Guaranty Clause and they renounce the laws in their favor with the General one that prohibits it; and thus they grant it and sign witnesses being Don Manuel Guerrero Don Francisco Lossa and Santiago Lemaire residents of this city Present - - -

Note that at the signing of this document the aforesaid Jones said that if he did not complete the house in the said term of six months he obligates himself to pay the rent of the aforesaid Don Manuel de Lanzos of the house where he shall live and this until the conclusion

Jones-Lanzos bldg contract 1788 (Page 1)
Copy of English-transcribed document from original Spanish document in the City of New Orleans Notarial Archives.



SQUARE 47

LOT NO. 18532-01

of the aforesaid house construction to the above same witnesses -

Manuel de Lanzos

Robt. Jones

Before me

Pedro Pedesclaux

Notary Public

HISTORIC NEW ORLEANS COLLECTION
WILLIAMS RESEARCH CENTER
CHARTRES ST, NEW ORLEANS, LA 70130
VIEUX CARRÉ SURVEY —

Jones-Lanzos bldg contract 1788 (Page 2)
Copy of English-transcribed document from original Spanish document in the City of New Orleans Notarial Archives.

Appendix B.

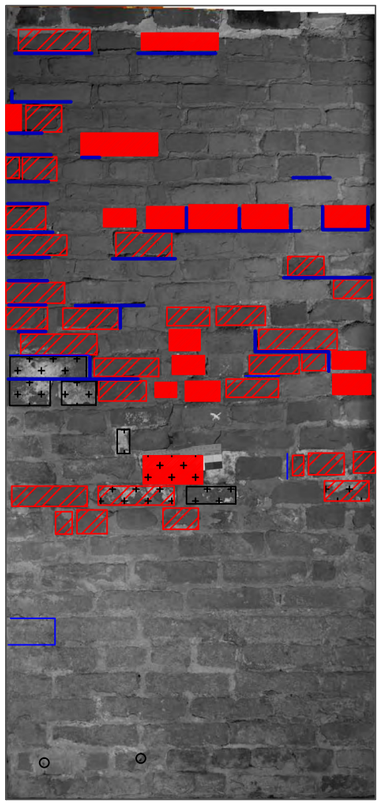
Condition Survey Documentation and Conditions Glossary

(S. Godwin, Y. Tyler and R. Jackson)



Madame John's Legacy Ground Floor Plan
Room Numbers and Wall Designations for Survey

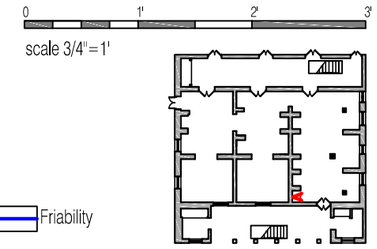
Room 283 Wall N1



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

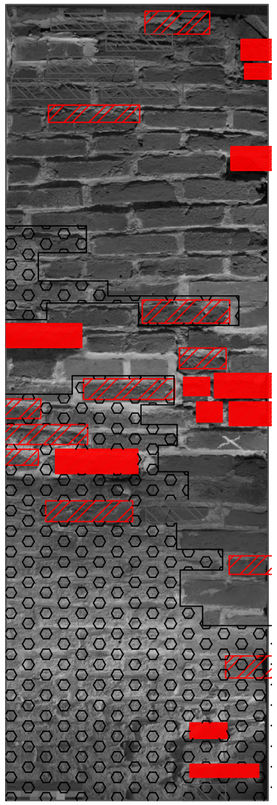
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

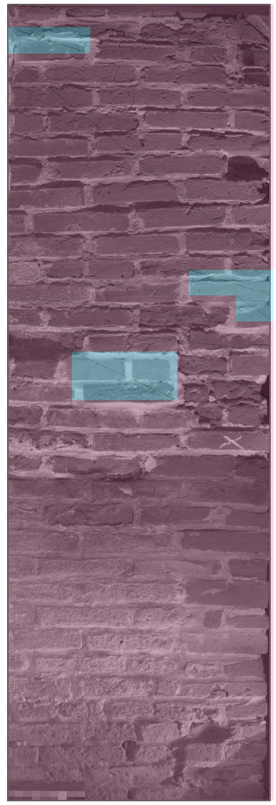
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 283 Wall NW2



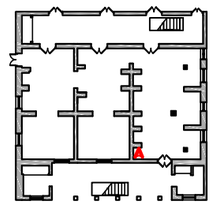
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

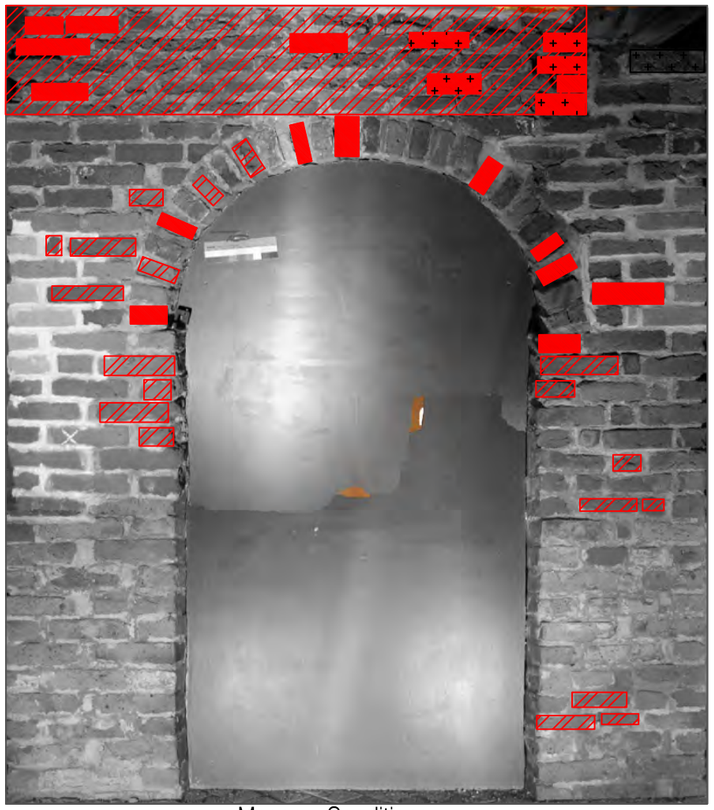
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

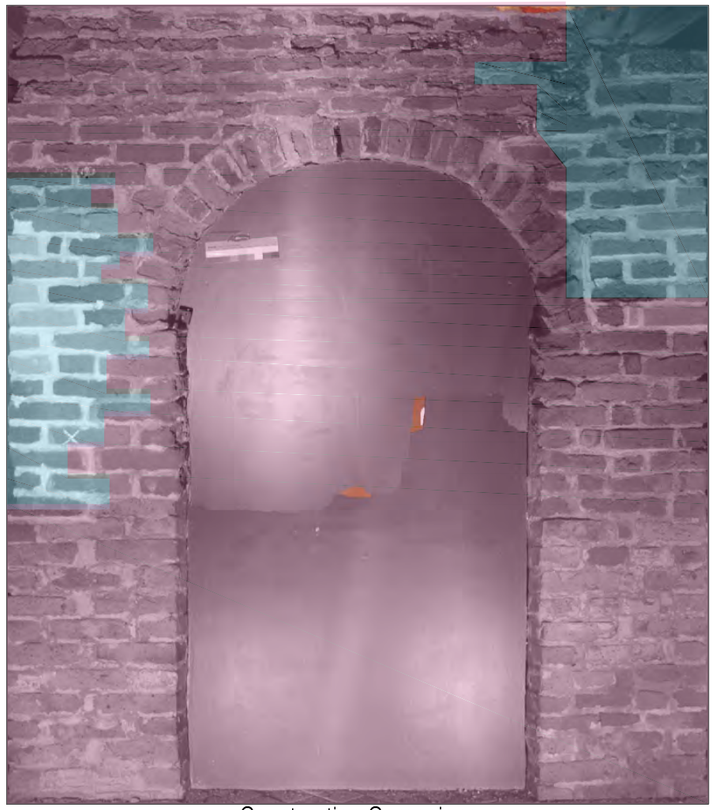
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 283 Wall NW3



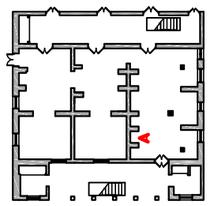
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4" = 1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

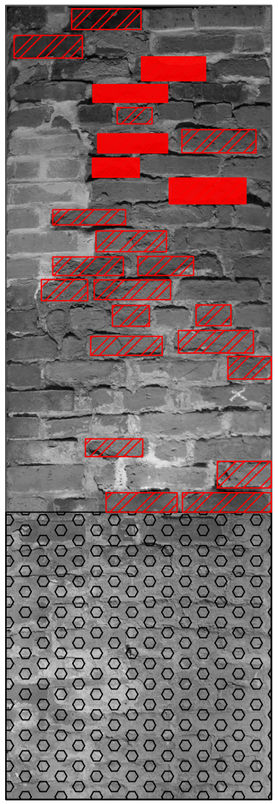
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Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

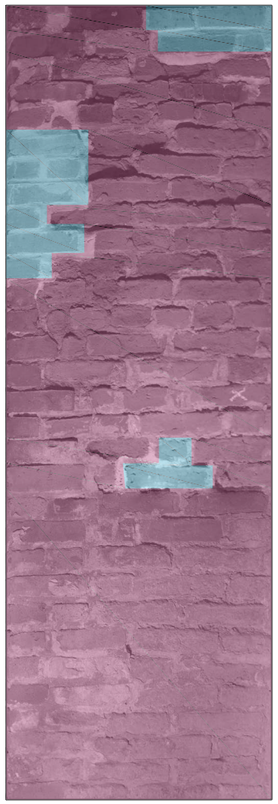
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

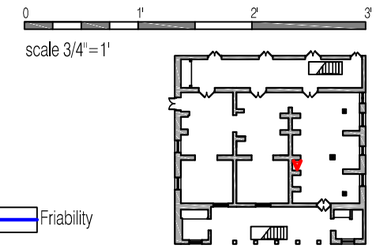
Room 283 Wall NW4



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

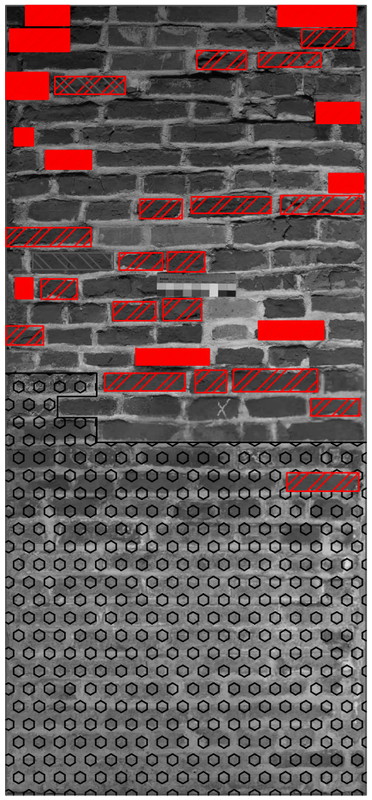
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 283 Wall NW5



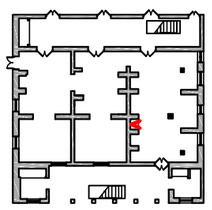
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

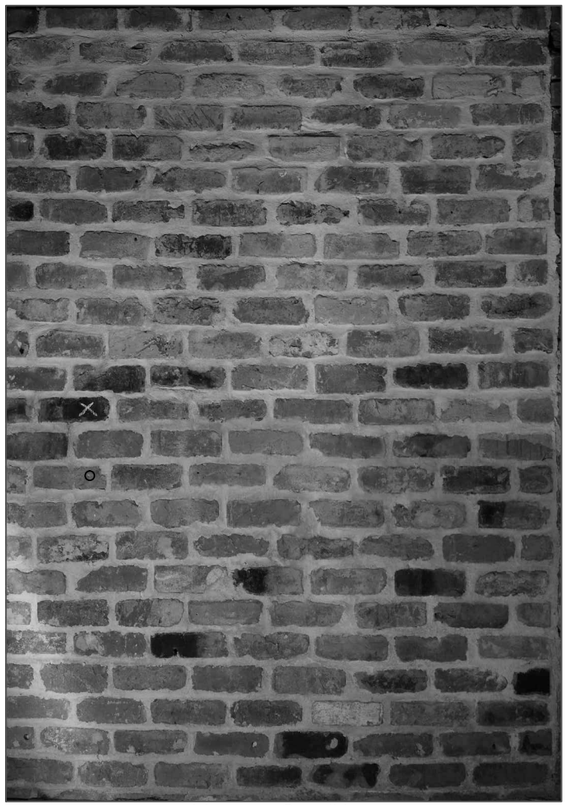
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

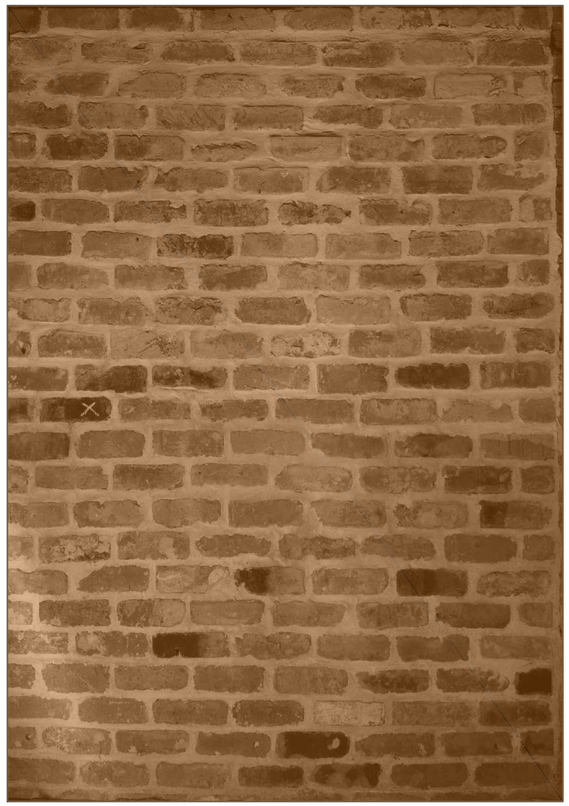
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 283 Wall SE1



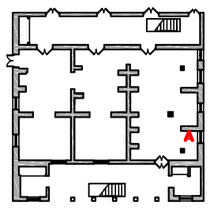
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

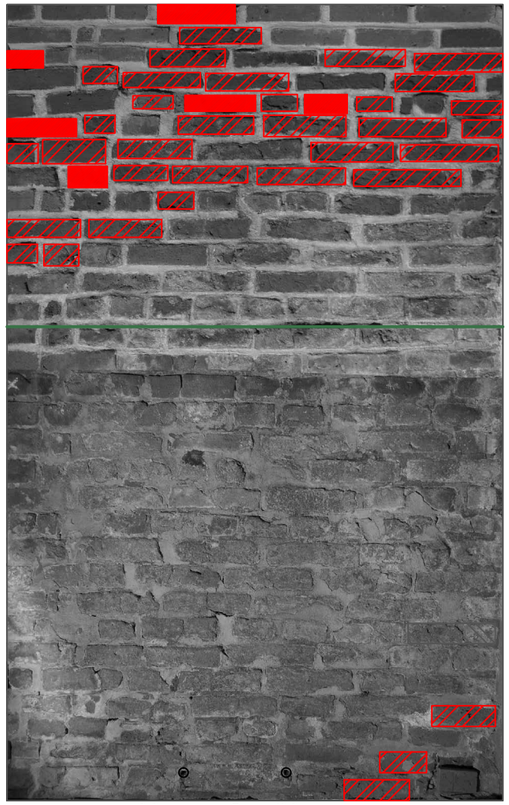
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 283 Wall SE2



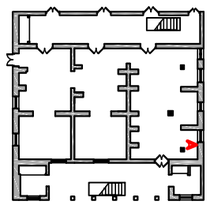
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

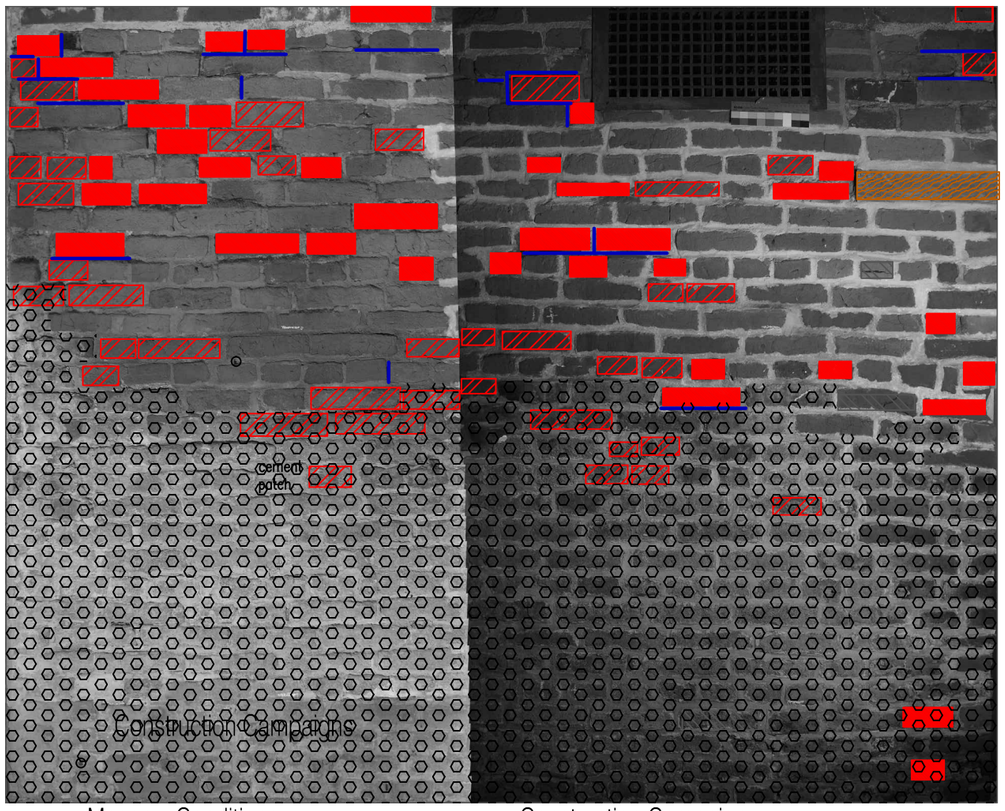
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

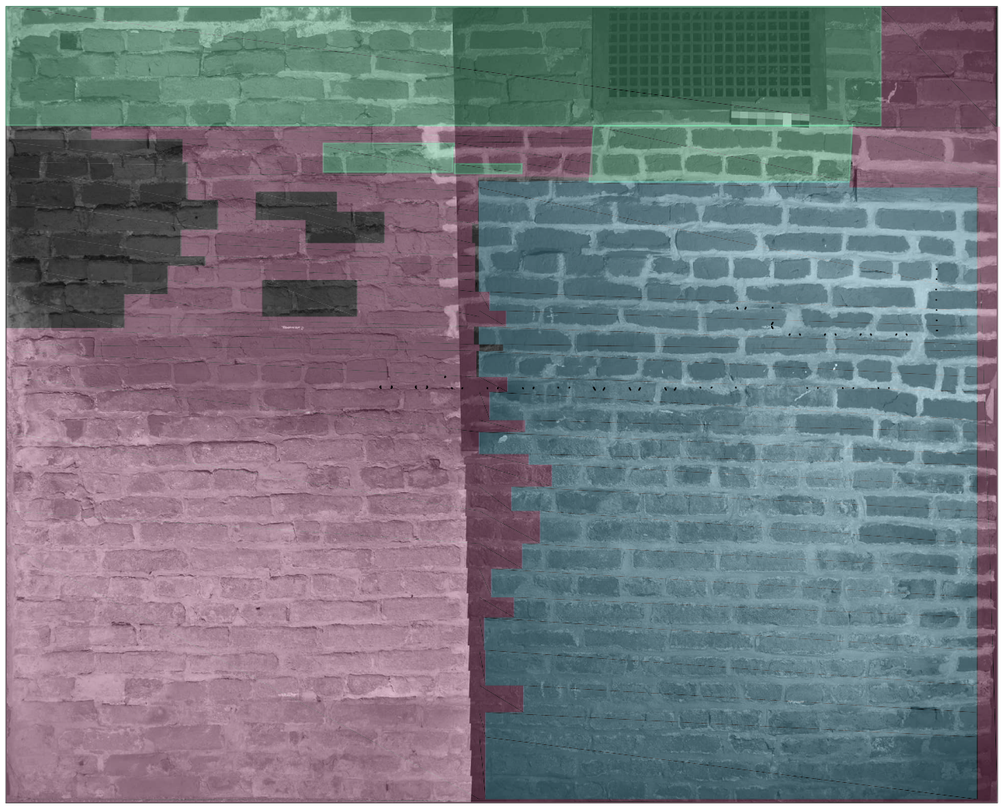
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 283 Wall SW1

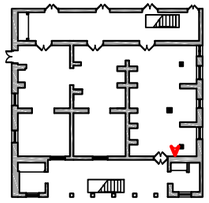


Masonry Conditions



Construction Campaigns

scale 3/4" = 1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

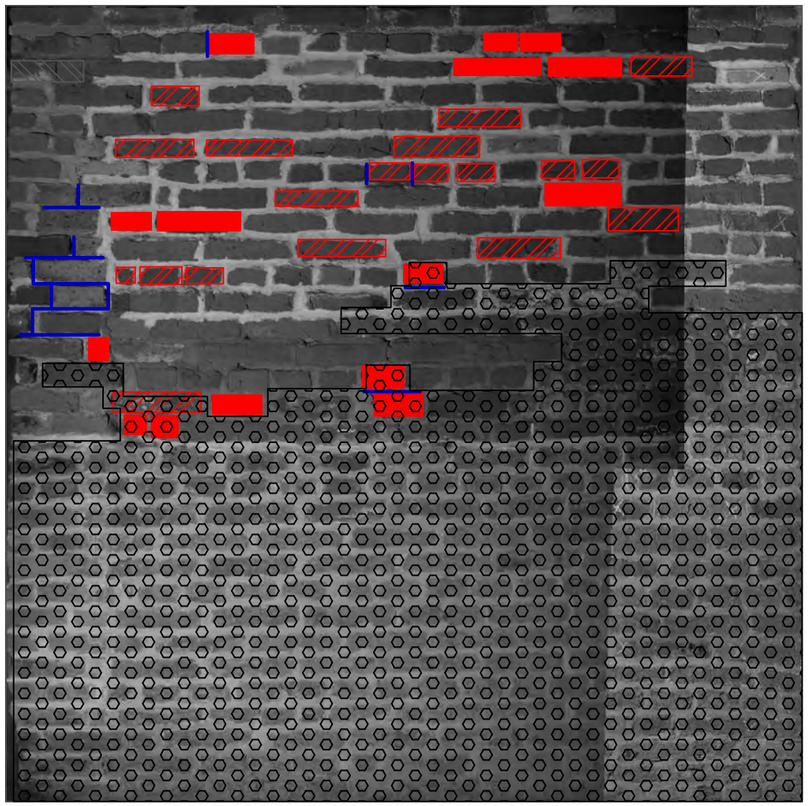
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Madame John's Legacy

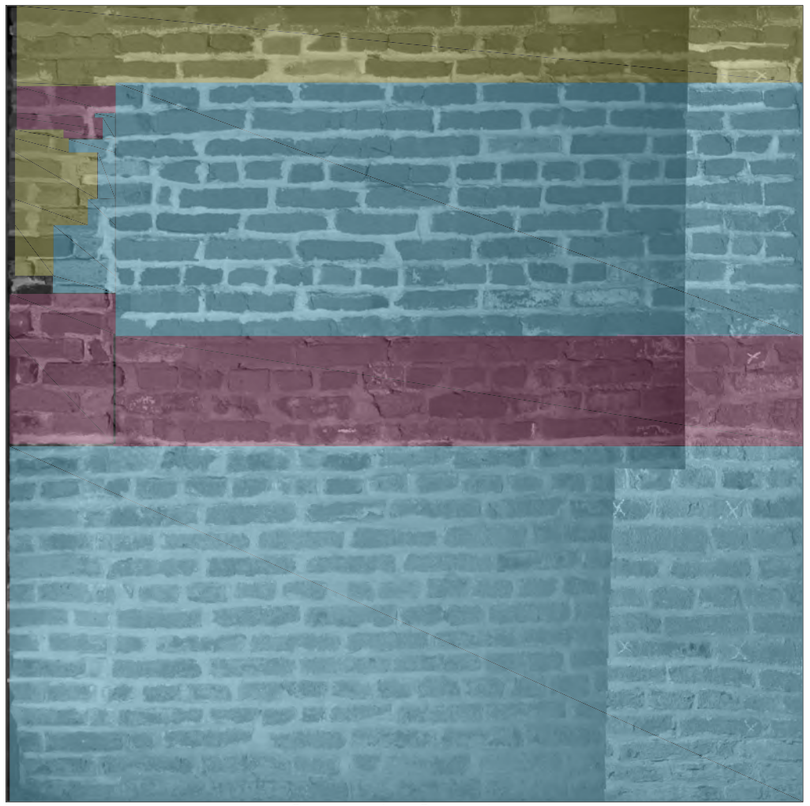
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 283 Wall SW2



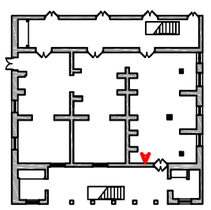
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4" = 1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

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Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 283 Column 1



Masonry Conditions



Construction Campaigns

Column 1 NE



Masonry Conditions



Construction Campaigns

Column 1 SE



Masonry Conditions



Construction Campaigns

Column 1 SW



Masonry Conditions

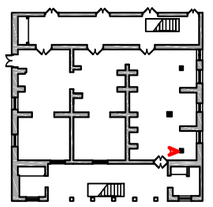


Construction Campaigns

Column 1 NW

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

Earliest Existing

1948 Koch & Wilson

1972 Labouisse

1982 Brockway

1996 N-Y Associates

Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss

Major Surface Loss

Minor Efflorescence

Major Efflorescence

Visible Moisture

Through-Masonry Crack

Cracked Brick

Open Mortar Joint

Friability

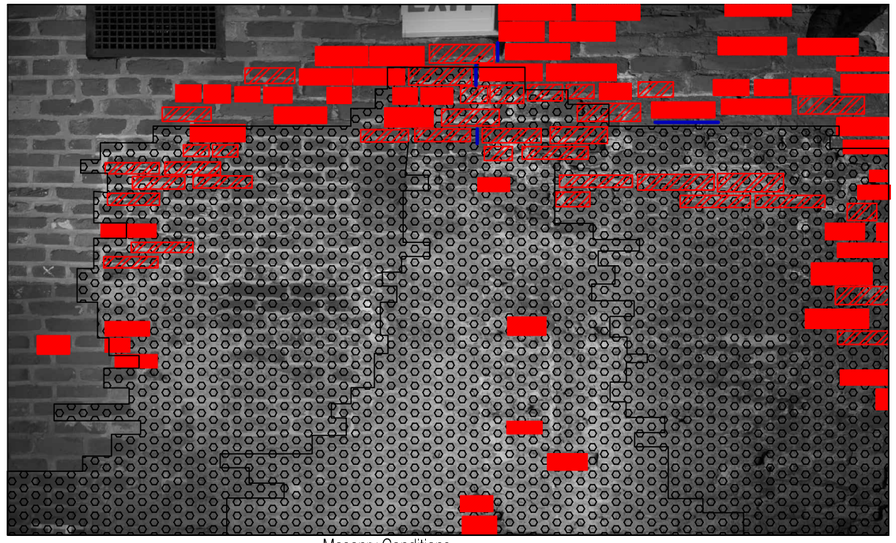
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall NE1



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

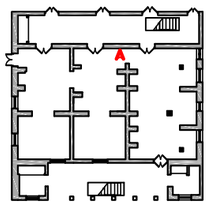
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2"=1'



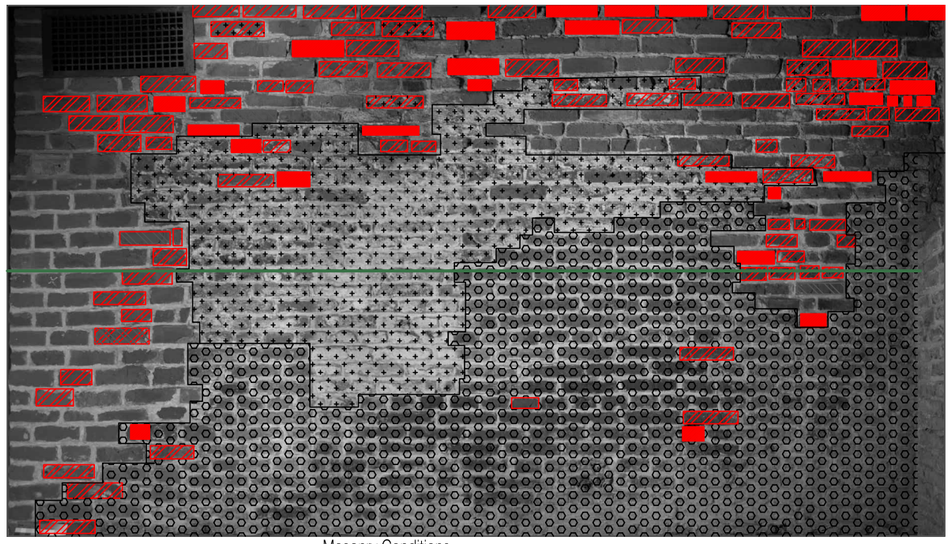
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall NE2



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

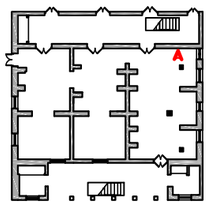
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



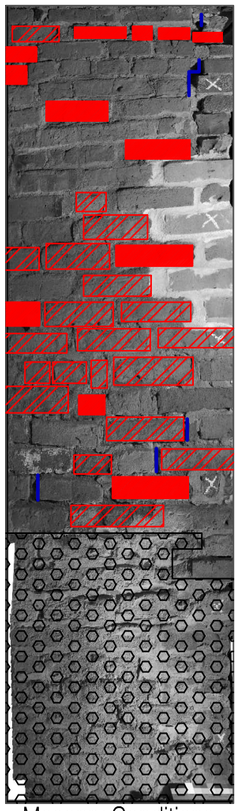
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall NW2



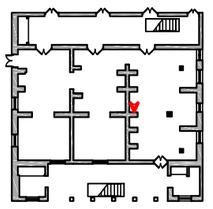
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4" = 1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

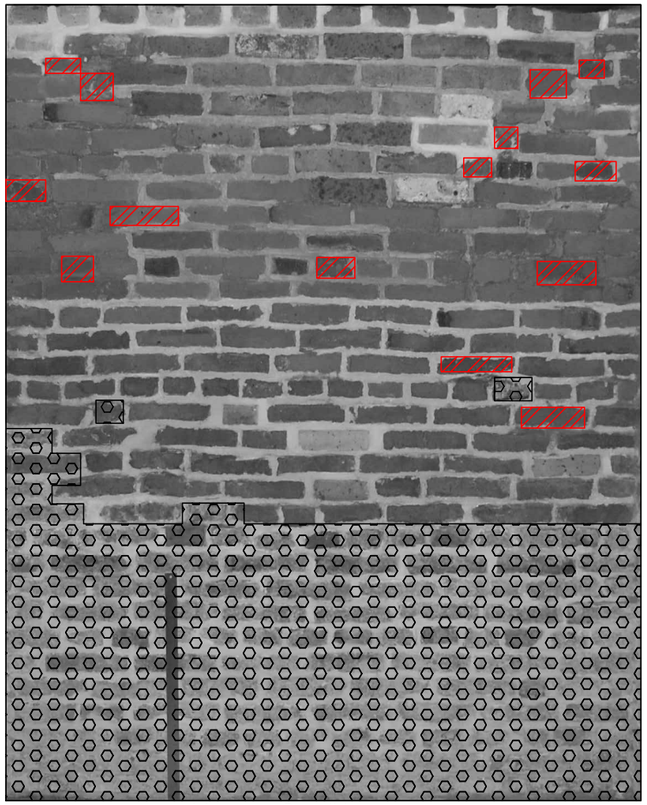
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Madame John's Legacy

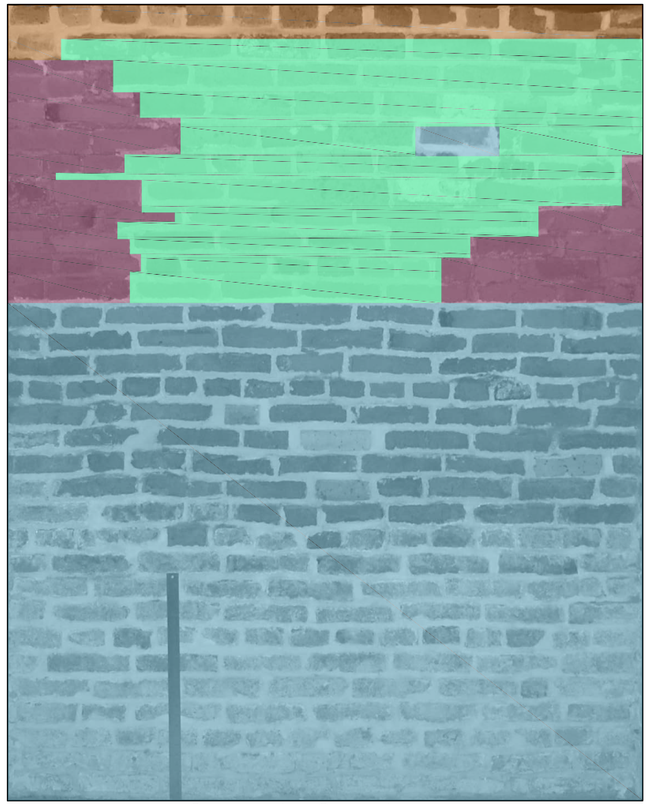
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall NW3



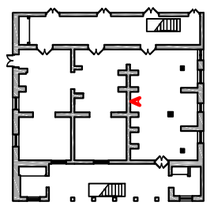
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4" = 1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

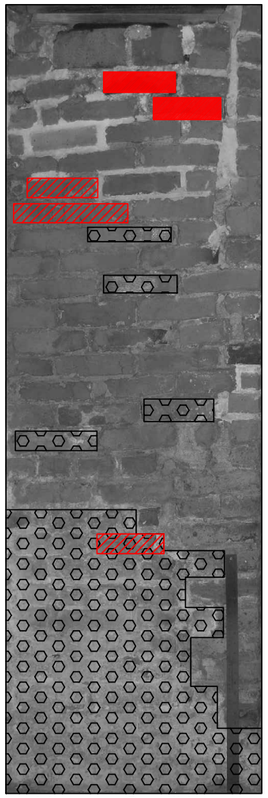
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

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632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall NW4



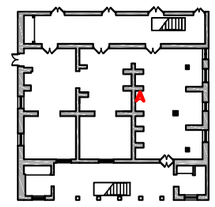
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

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Documentation of Brick Masonry Wall Conditions and Construction Campaigns

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Room 282 Wall NW5



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

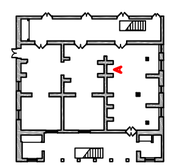
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 3/4" = 1'



Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

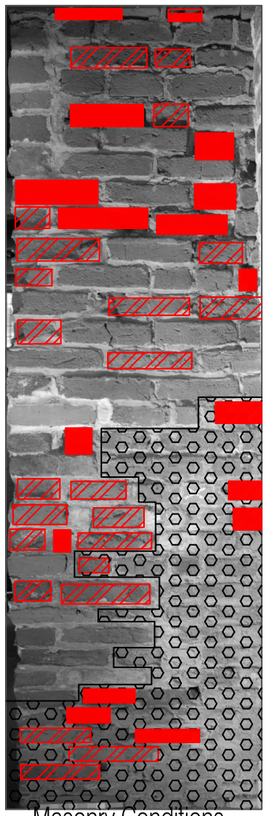
Documentation of Brick Masonry Wall Conditions and Construction Campaigns

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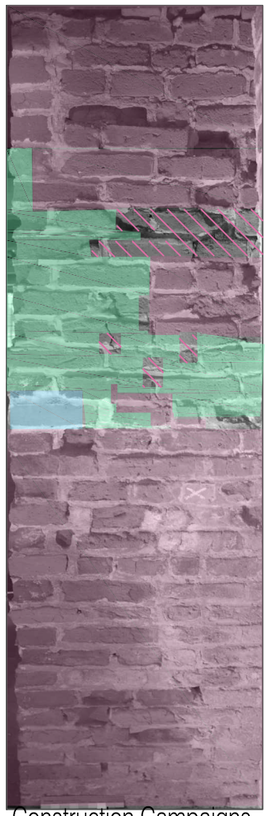
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PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

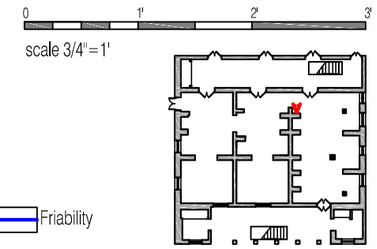
Room 282 Wall NW6



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

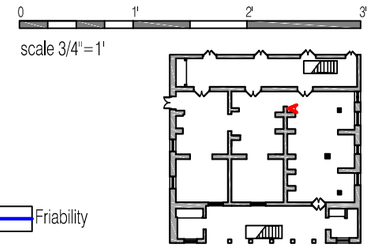
Room 282 Wall NW7



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

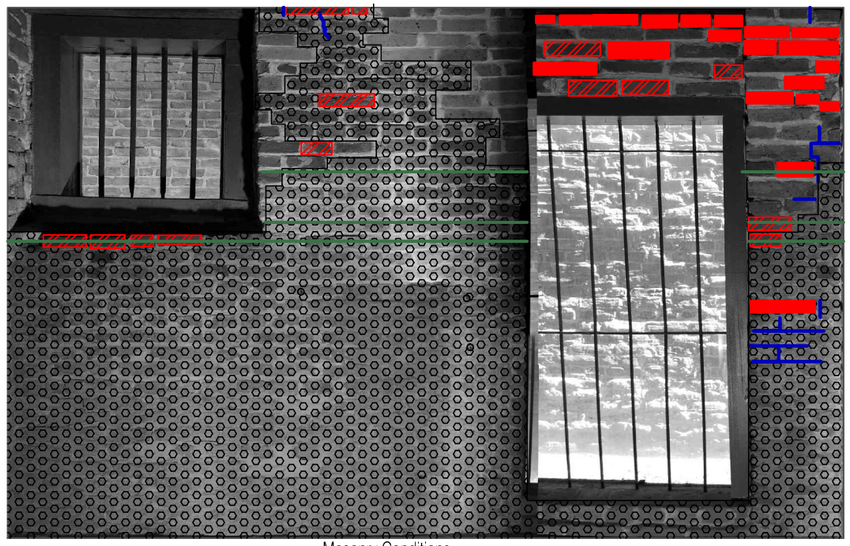
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall SE1



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

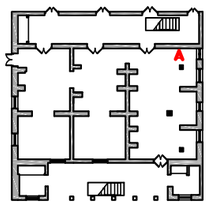
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2"=1'



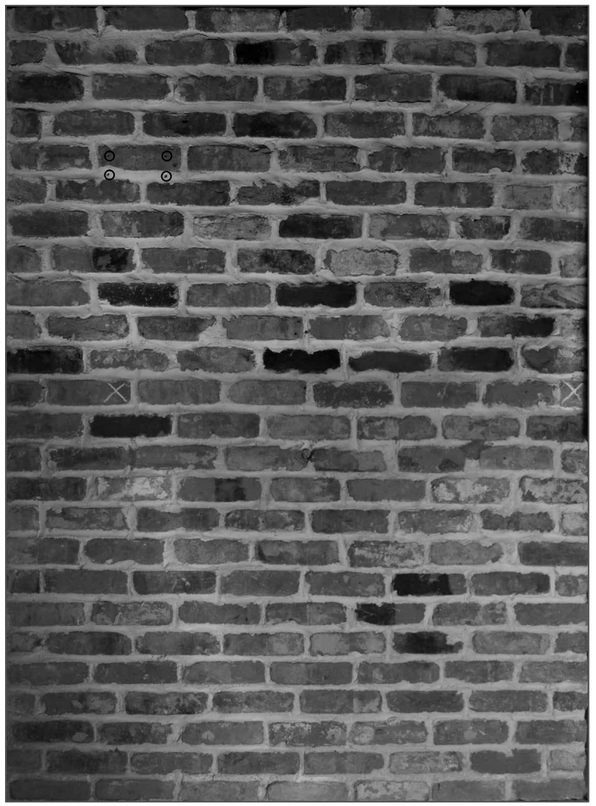
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

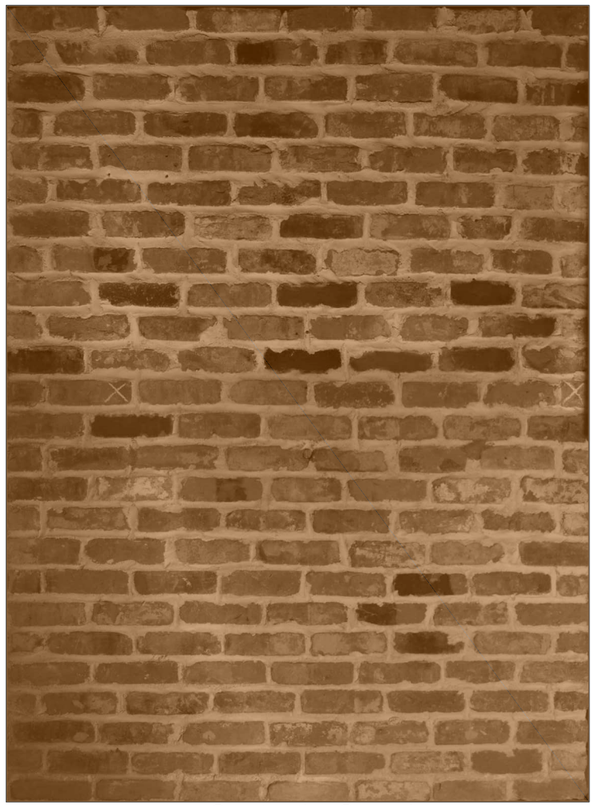
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

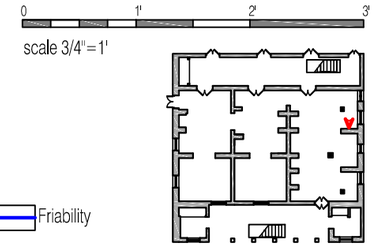
Room 282 Wall SE2



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall SE3



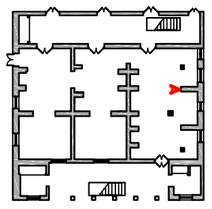
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

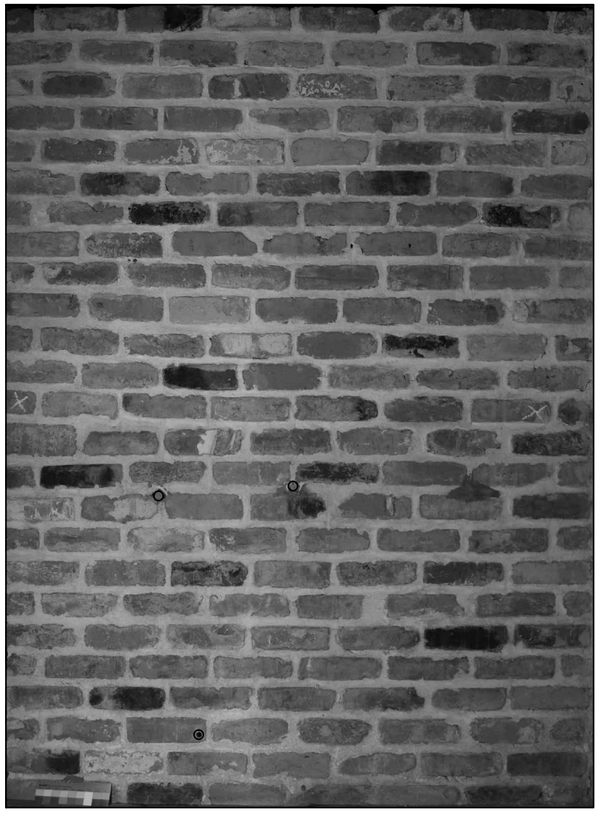
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

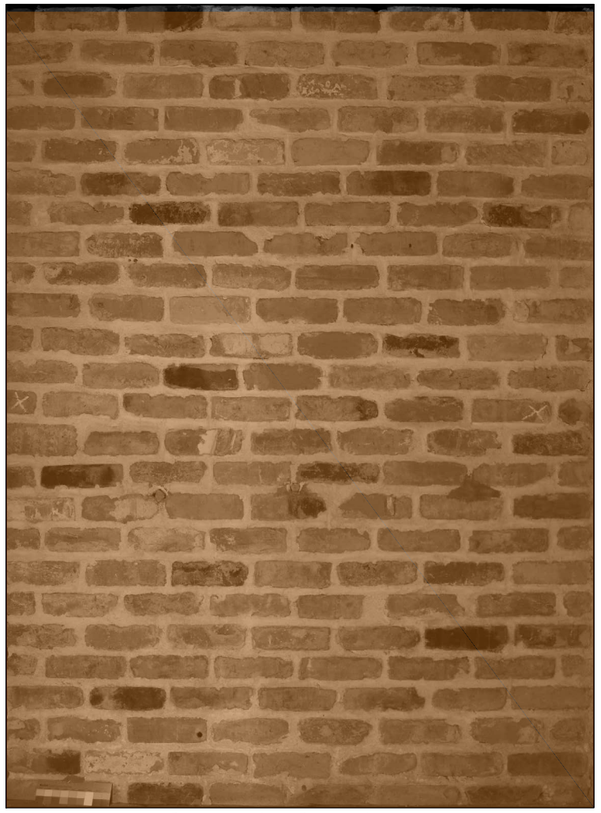
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall SE4



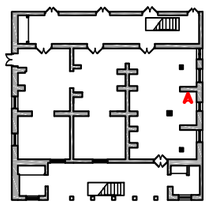
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

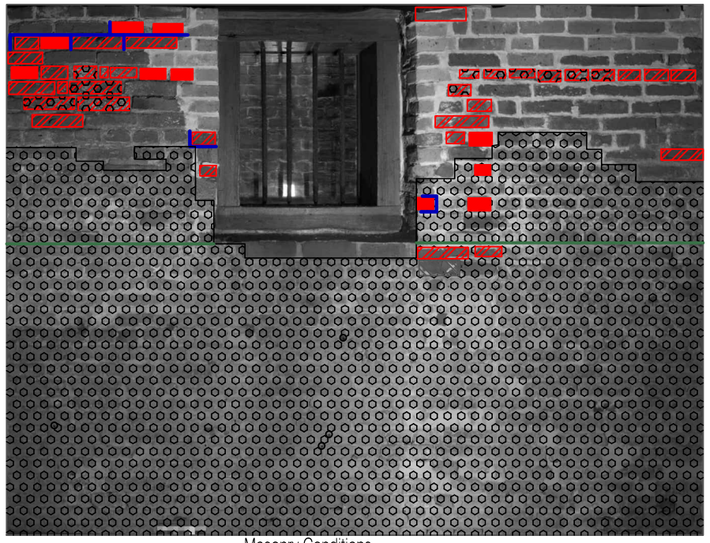
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall SE5



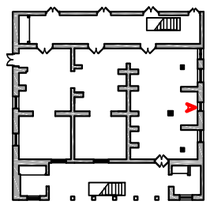
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 1/2"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

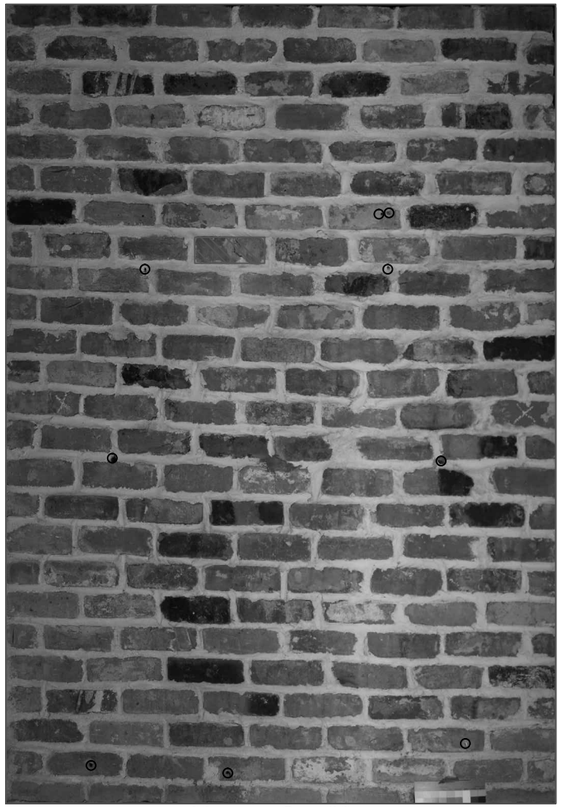
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

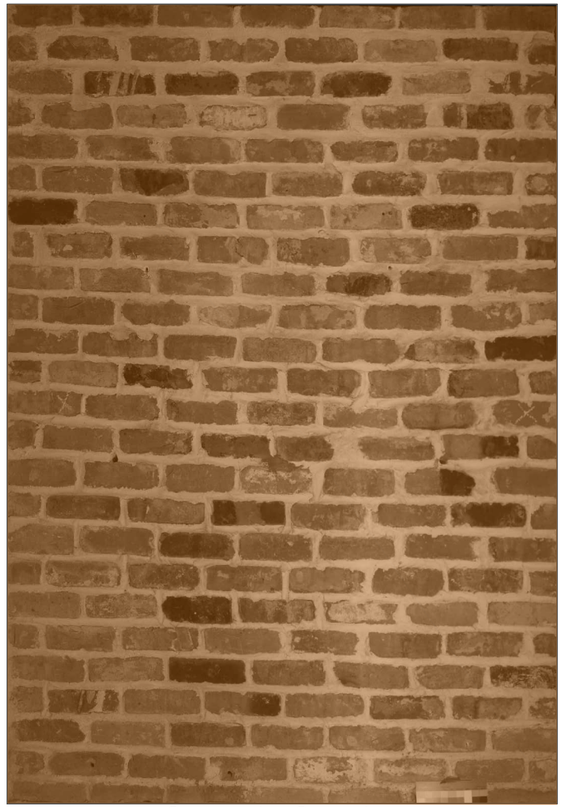
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

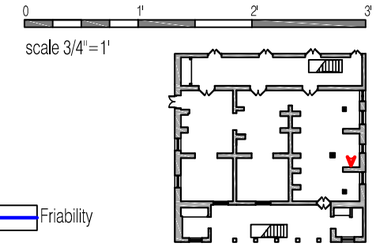
Room 282 Wall SE6



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

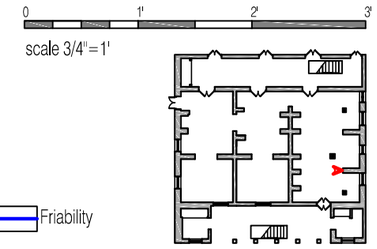
Room 282 Wall SE7



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

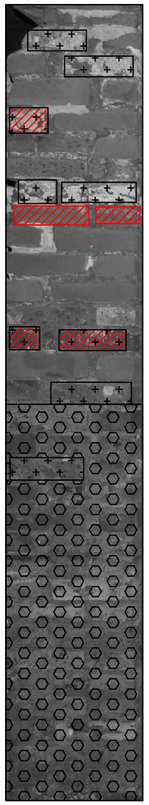
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Wall NW1



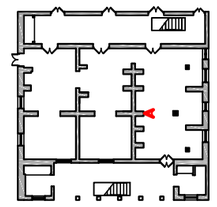
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Wall Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Column 1



Masonry Conditions



Construction Campaigns

Column 1 NE



Masonry Conditions



Construction Campaigns

Column 1 SE



Masonry Conditions



Construction Campaigns

Column 1 SW



Masonry Conditions

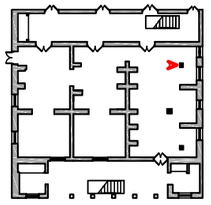


Construction Campaigns

Column 1 NW

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 282 Column 2



Masonry Conditions



Construction Campaigns

Column 2 NE



Masonry Conditions



Construction Campaigns

Column 2 SE



Masonry Conditions



Construction Campaigns

Column 2 SW



Masonry Conditions



Construction Campaigns

Column 2 NW

Legend for Construction Campaigns

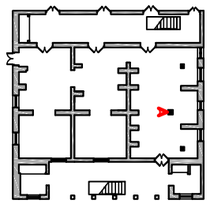
- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

0 1' 2' 3'

scale 3/4" = 1'



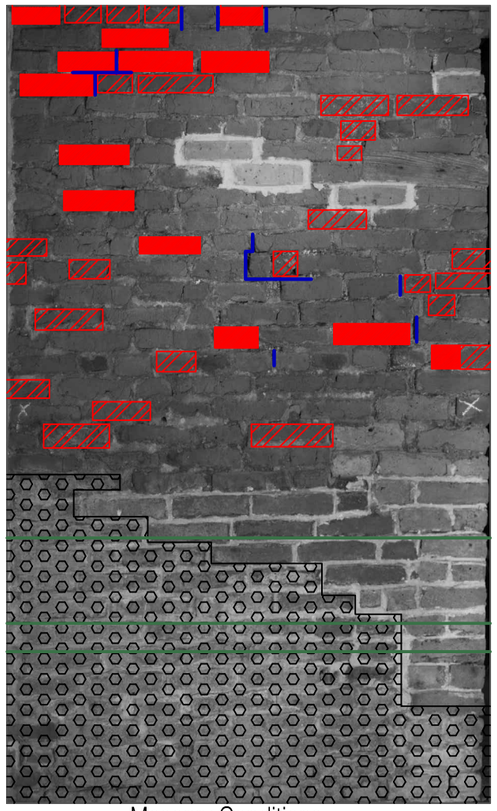
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

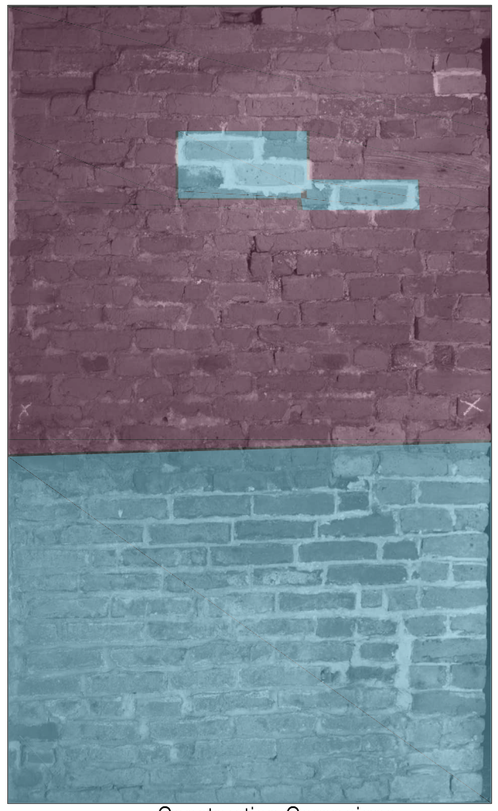
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

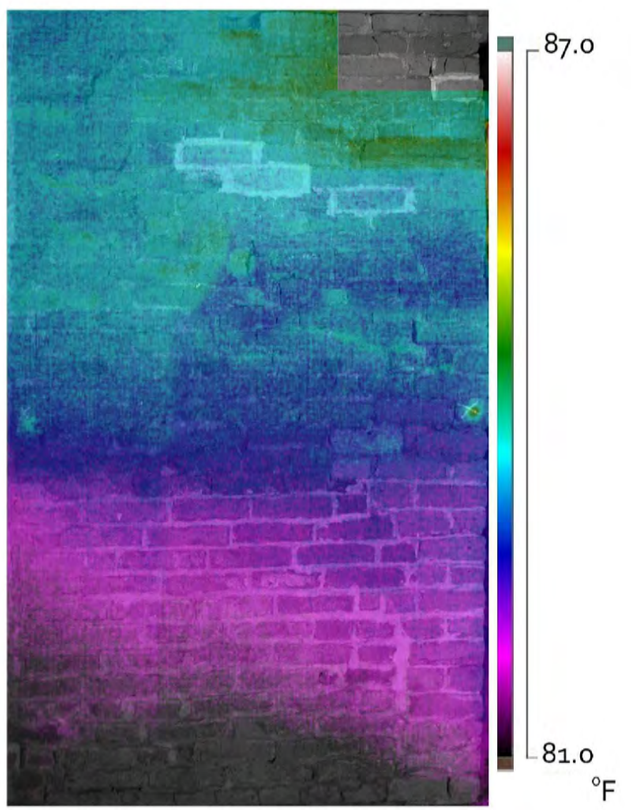
Room 281 Wall NE1



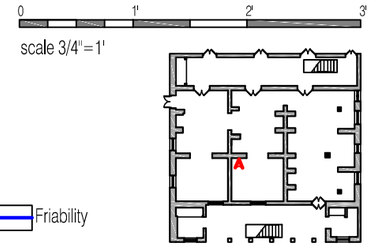
Masonry Conditions



Construction Campaigns



Thermo. Image



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

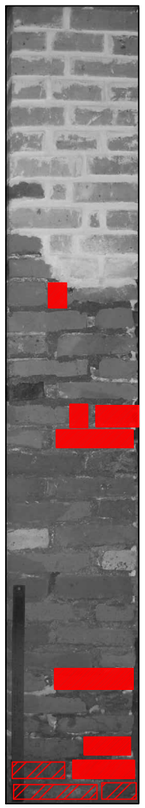
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 281 Wall NE2



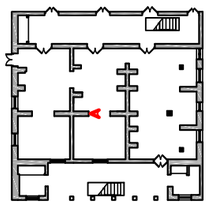
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

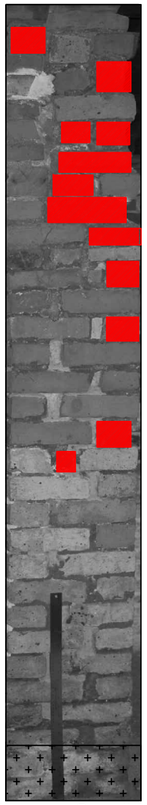
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 281 Wall NE3



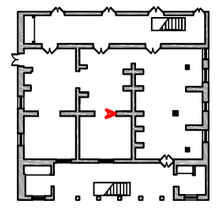
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

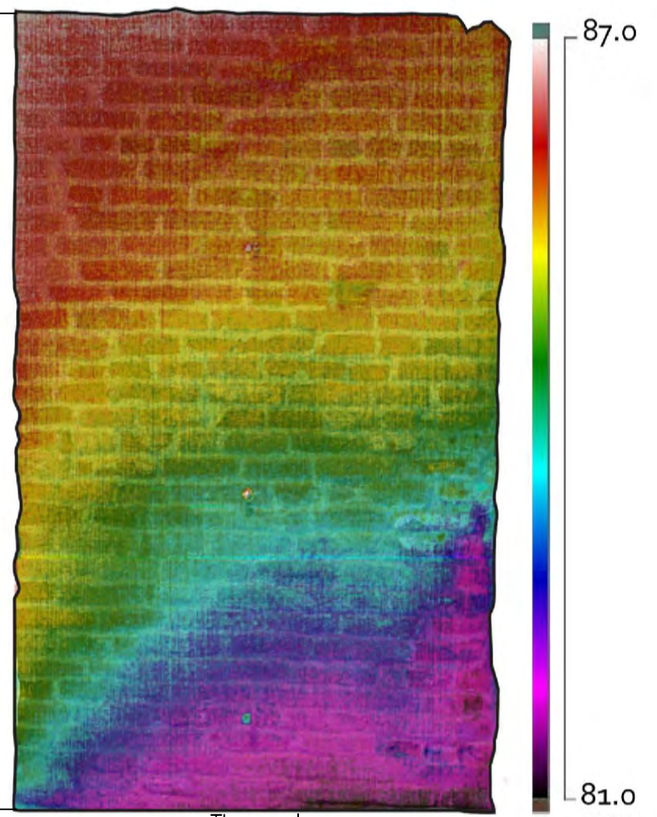
Room 281 Wall NE4



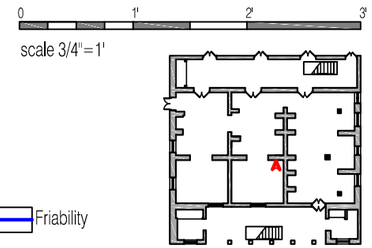
Masonry Conditions



Construction Campaigns



Thermo. Image



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

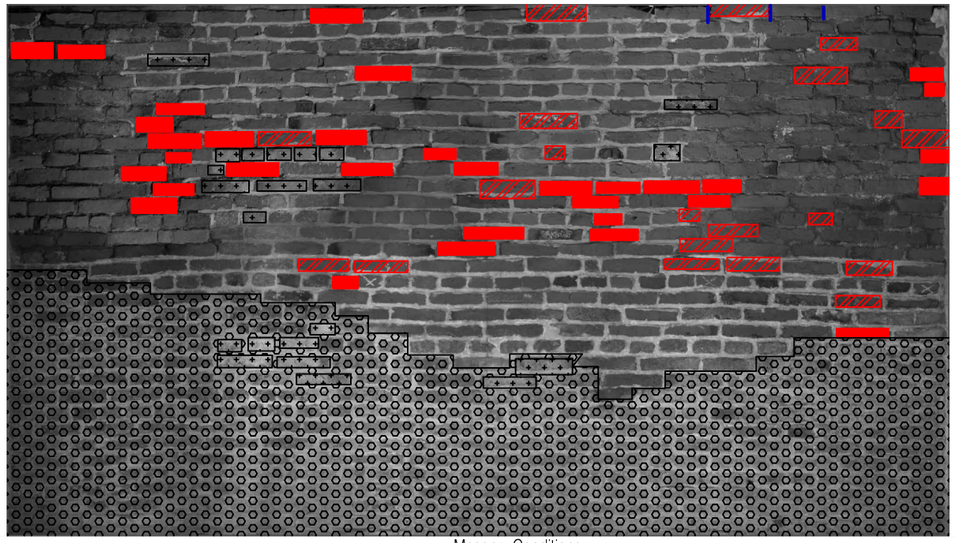
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Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

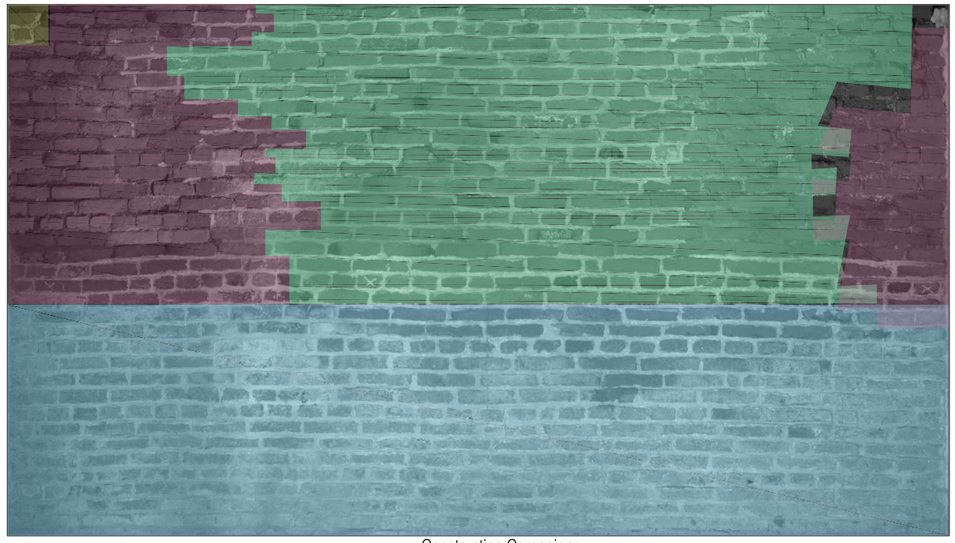
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

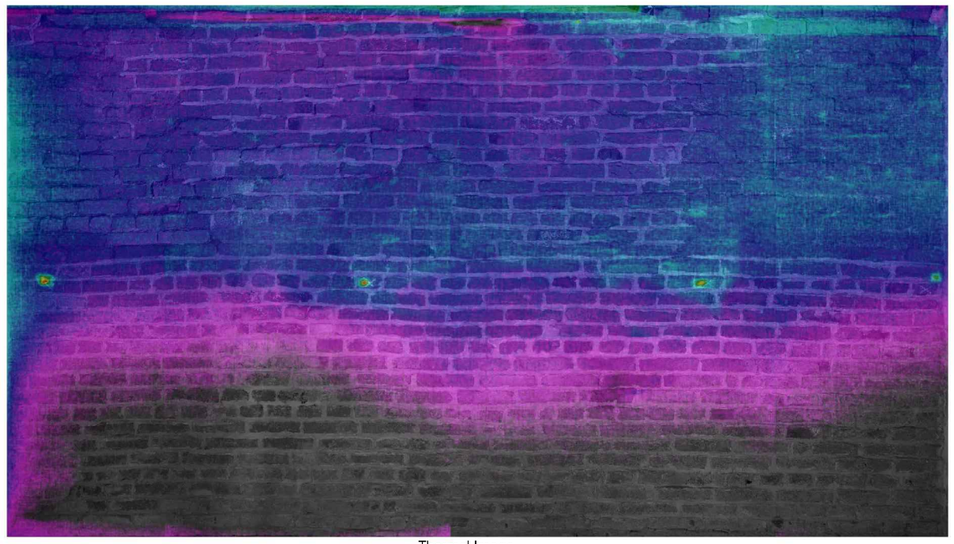
Room 281 Wall NW1



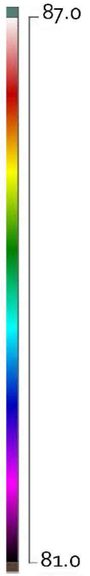
Masonry Conditions

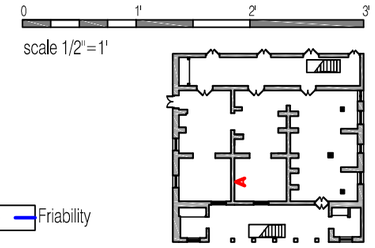


Construction Campaigns



Thermal Image





Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

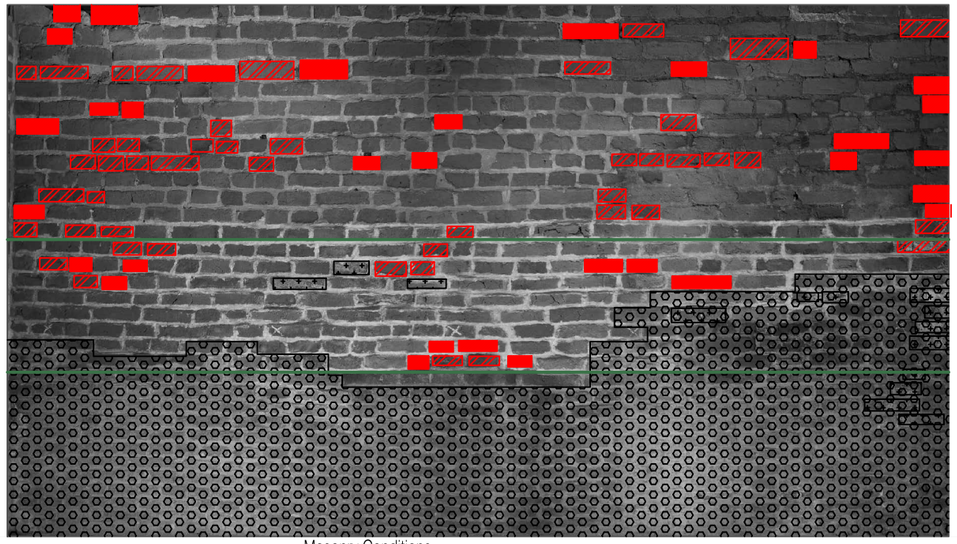
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

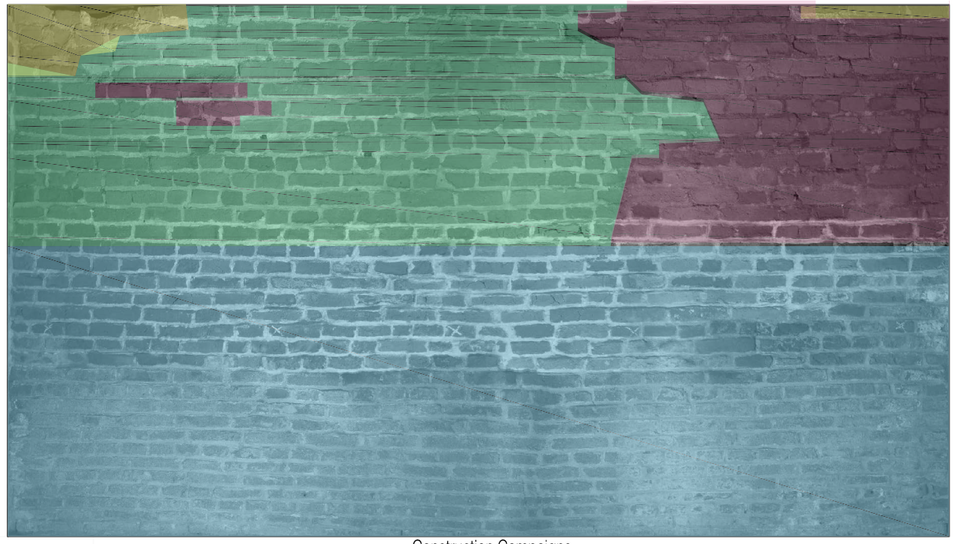
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

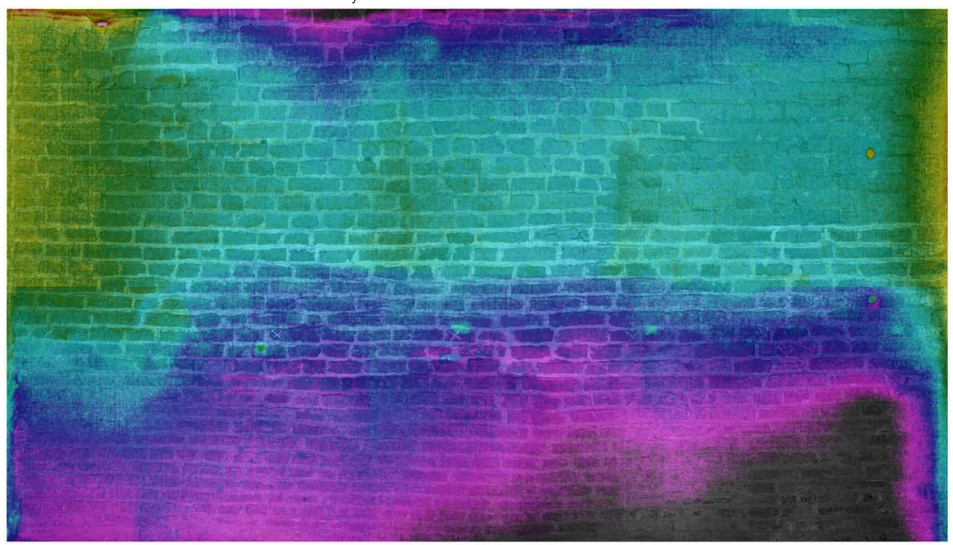
Room 281 Wall SE1



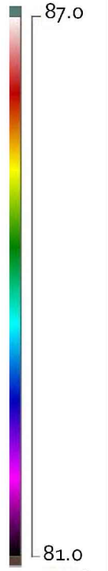
Masonry Conditions



Construction Campaigns

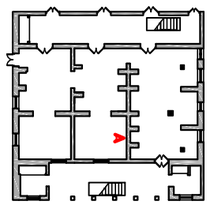


Thermal Image



0 1' 2' 3'

scale 1/2" = 1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

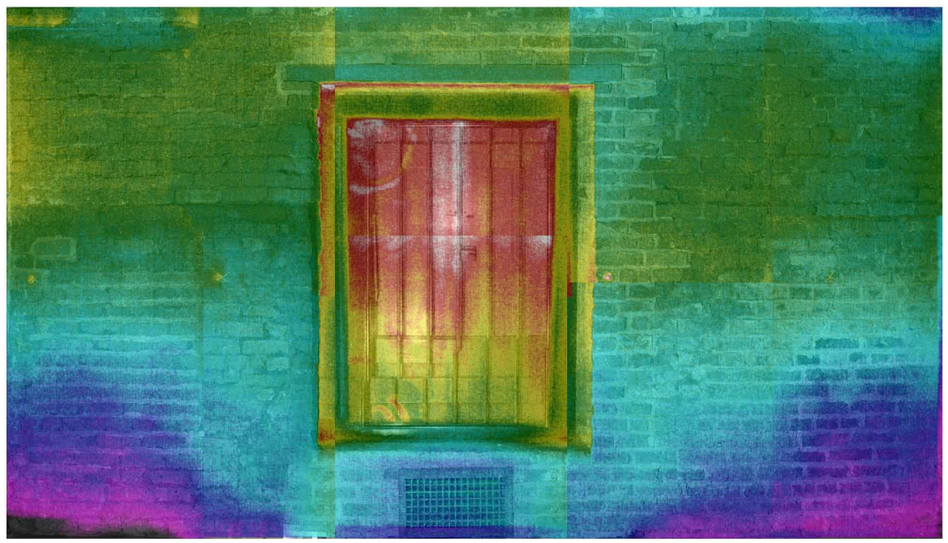
Room 281 Wall SW1



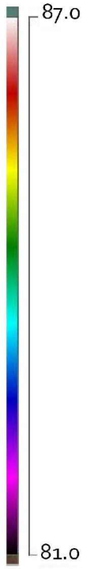
Masonry Conditions

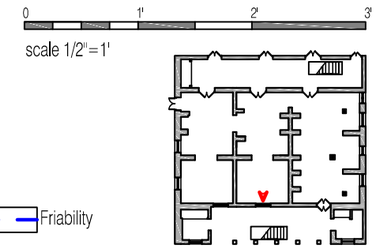


Construction Campaigns



Thermal Image





Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

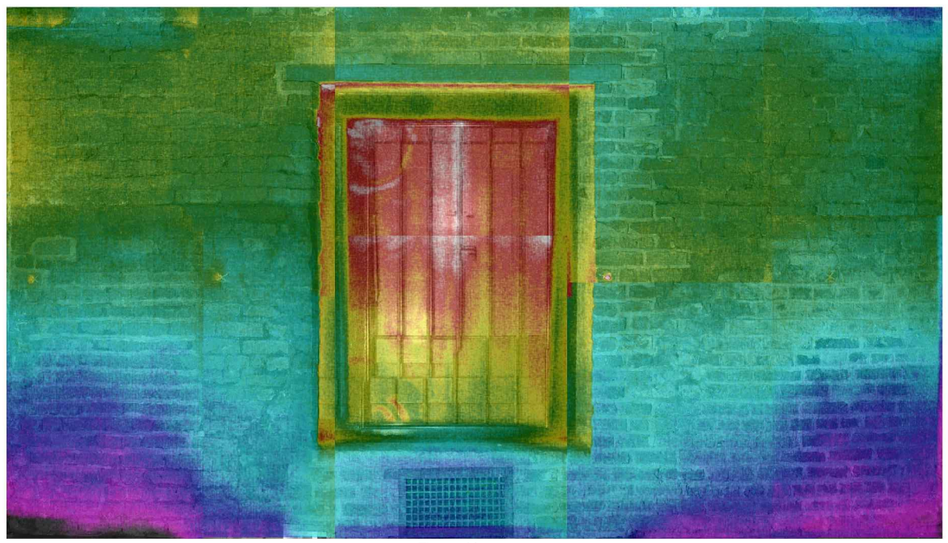
Room 281 Wall SW1



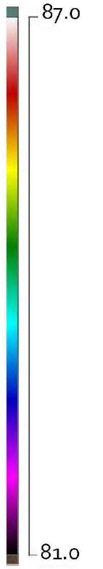
Masonry Conditions

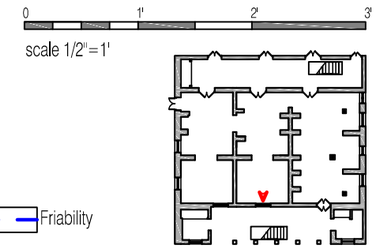


Construction Campaigns



Thermal Image





Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

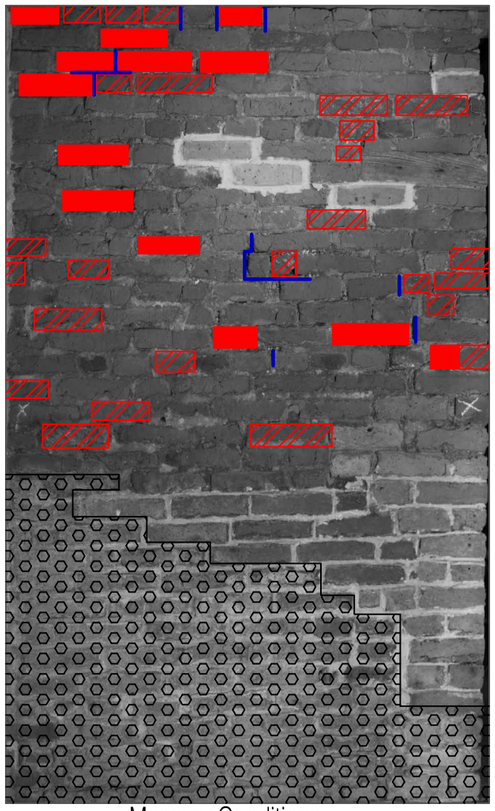
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

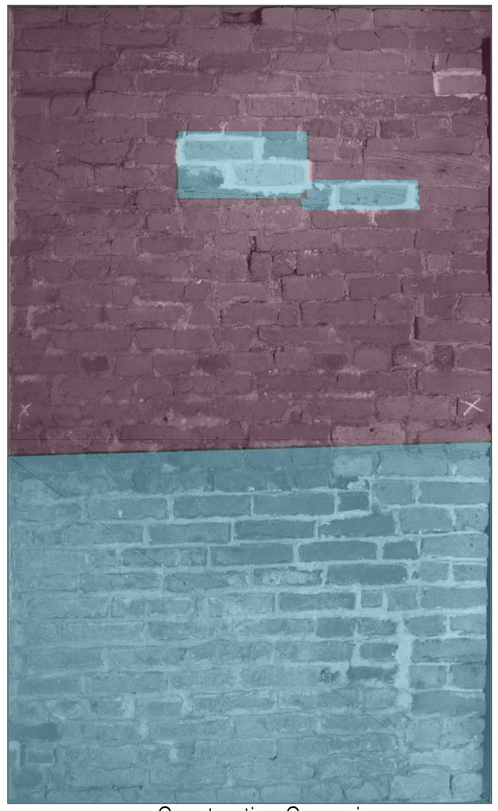
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

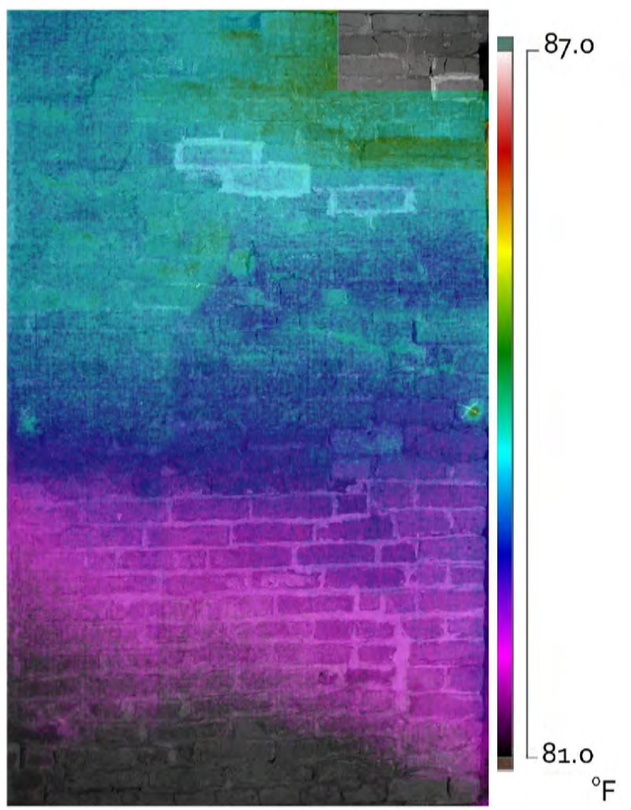
Room 281 Wall NE1



Masonry Conditions



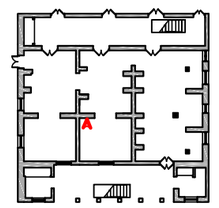
Construction Campaigns



Thermo. Image

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

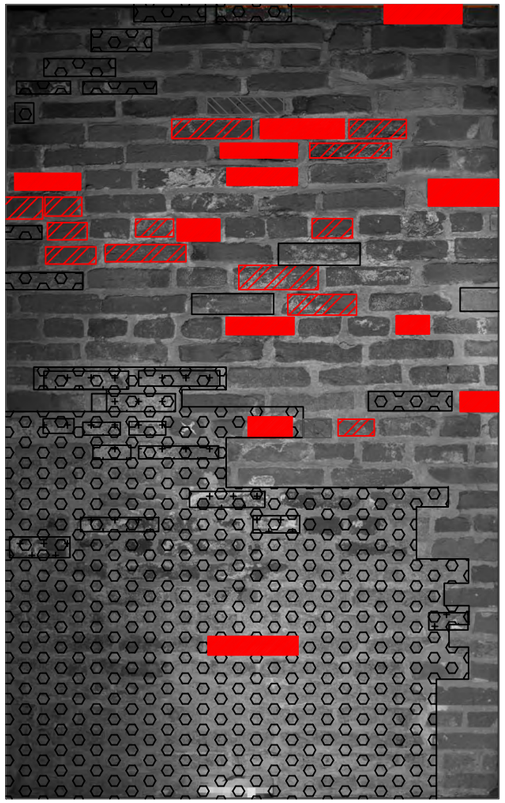
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Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

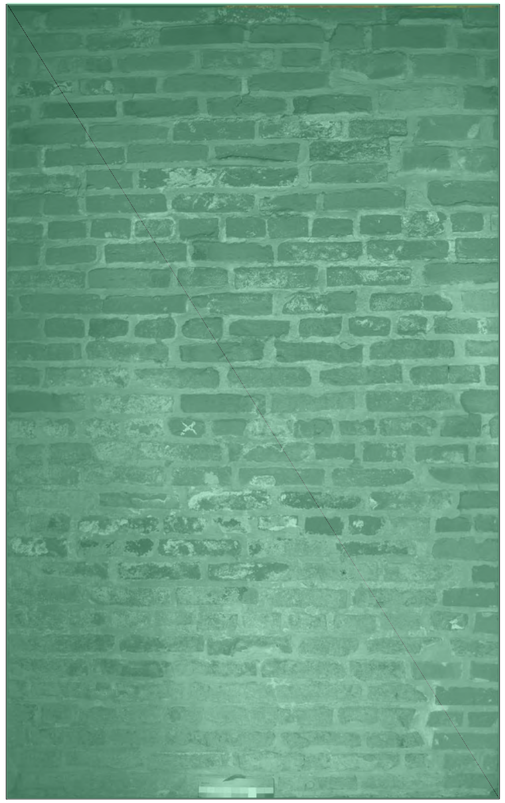
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

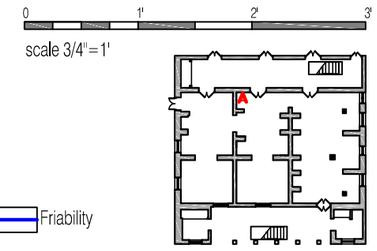
Room 280 Wall NE1



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

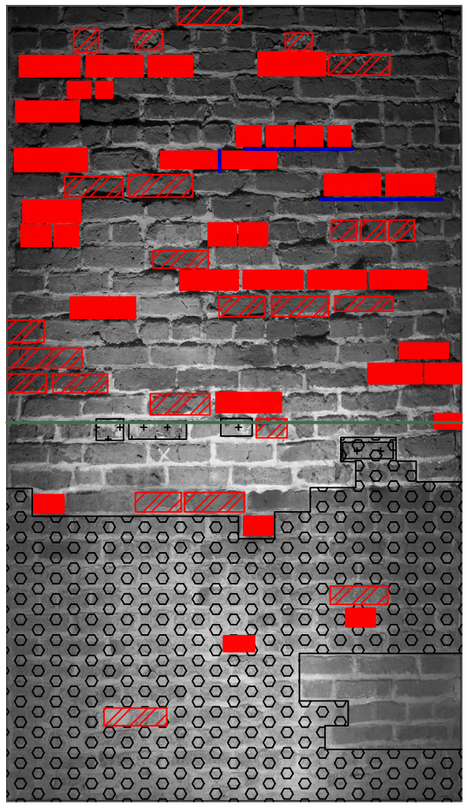
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

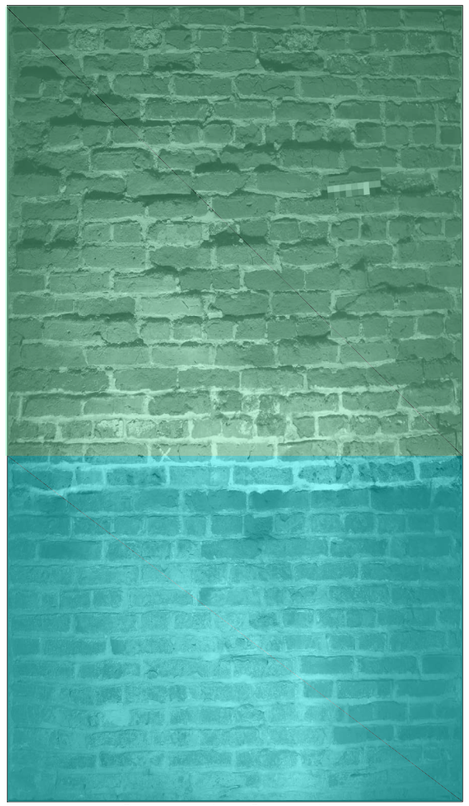
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall NW1



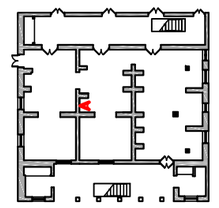
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

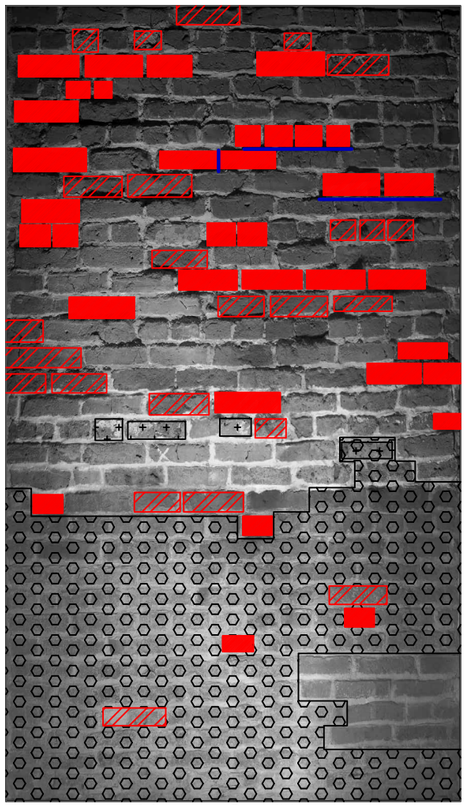
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

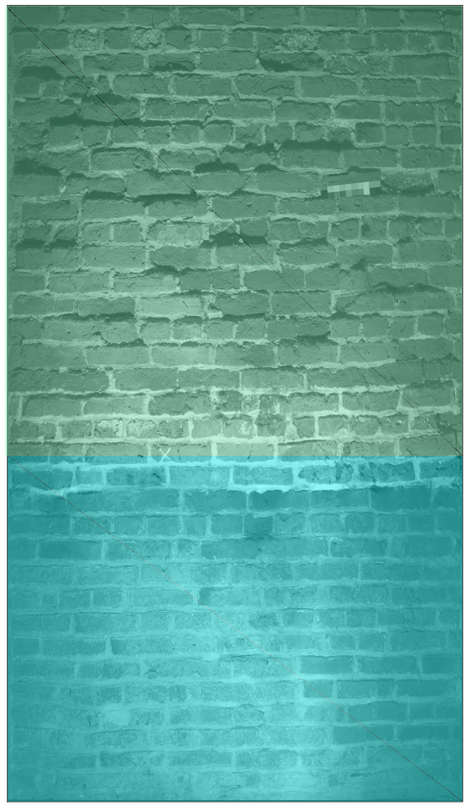
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall NW1



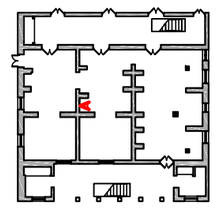
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

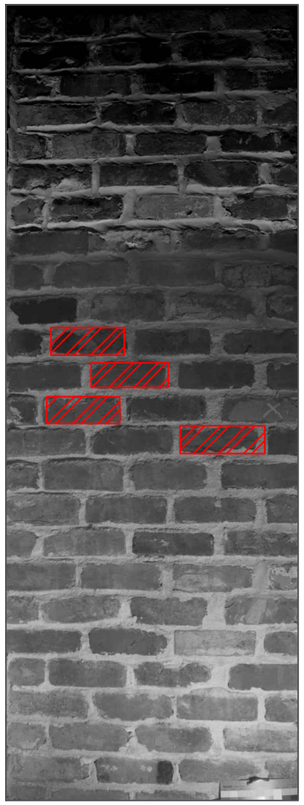
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall NW2



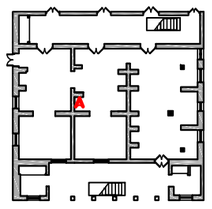
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall NW3



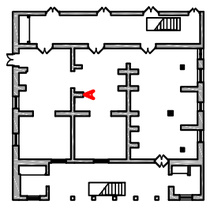
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

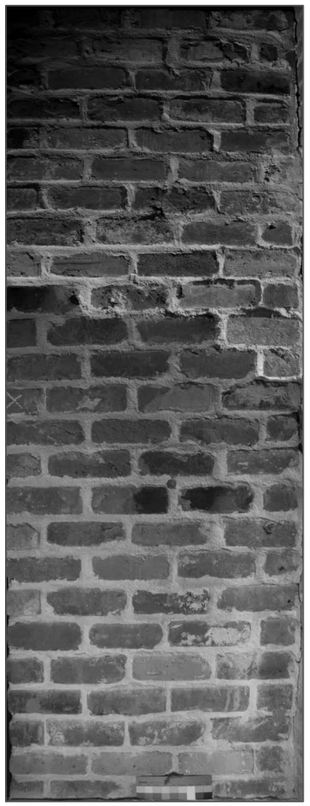
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall NW4



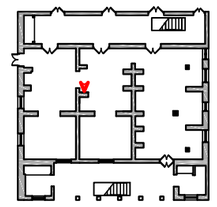
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

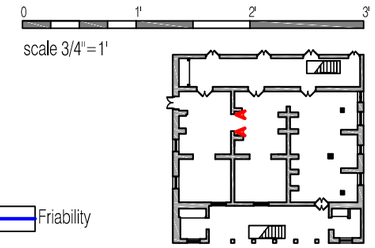
Room 280 Wall NW5



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall NW6



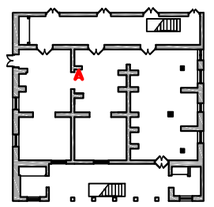
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall NW7



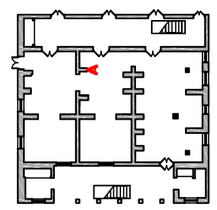
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

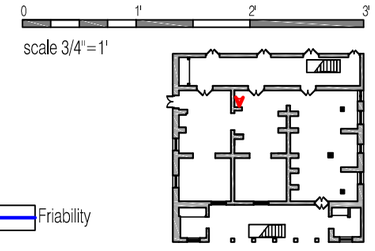
Room 280 Wall NW8



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

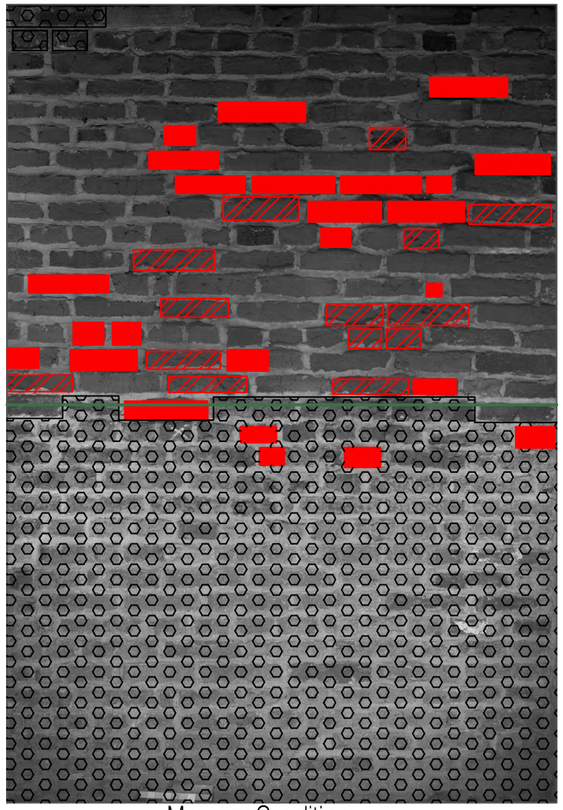
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

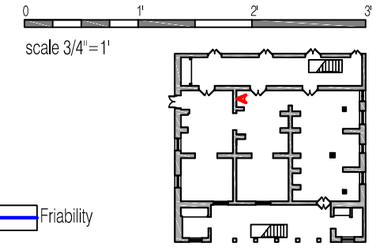
Room 280 Wall NW9



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

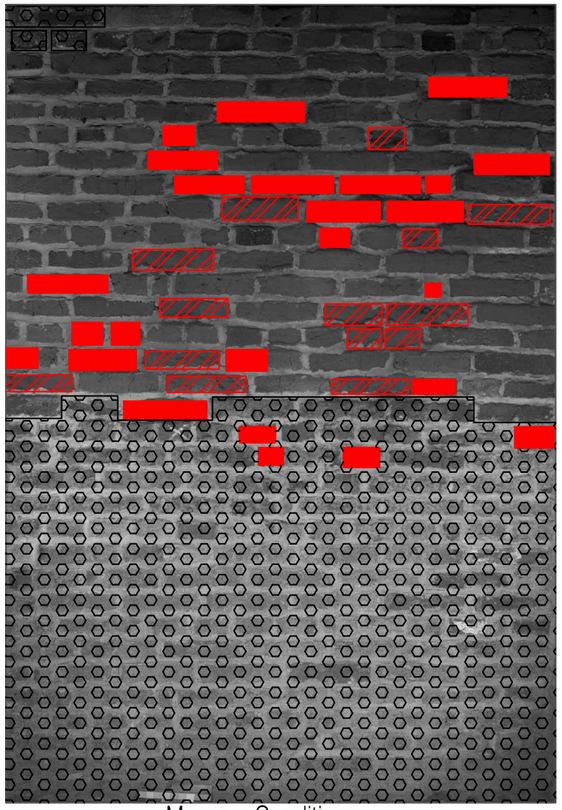
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

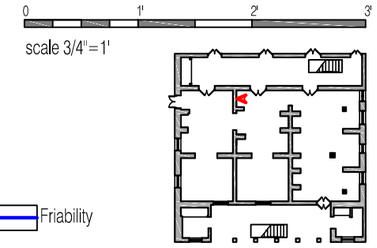
Room 280 Wall NW9



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall SE1



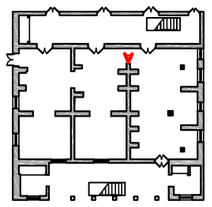
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall SE2



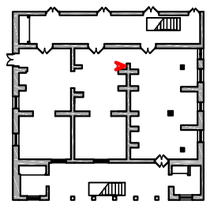
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

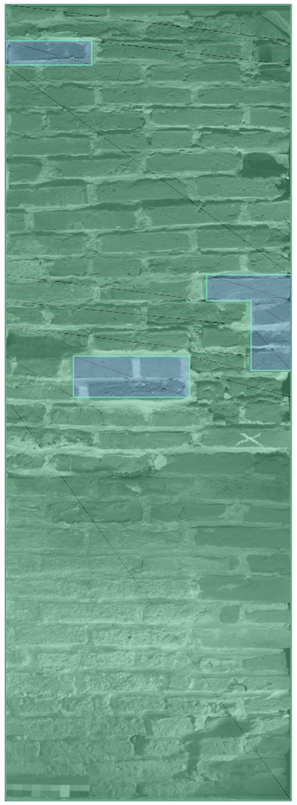
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

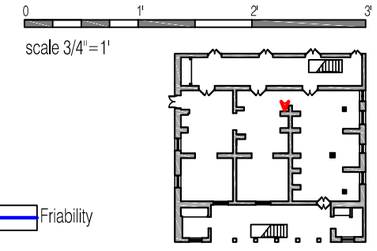
Room 280 Wall SE3



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall SE4



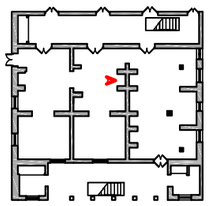
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4" = 1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

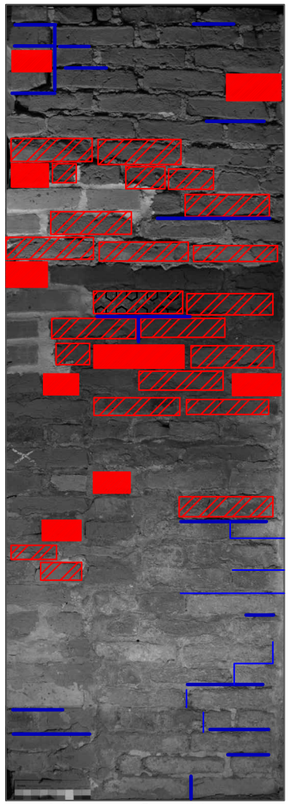
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

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Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall SE5



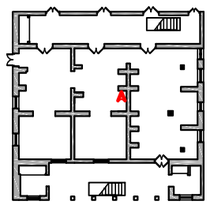
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

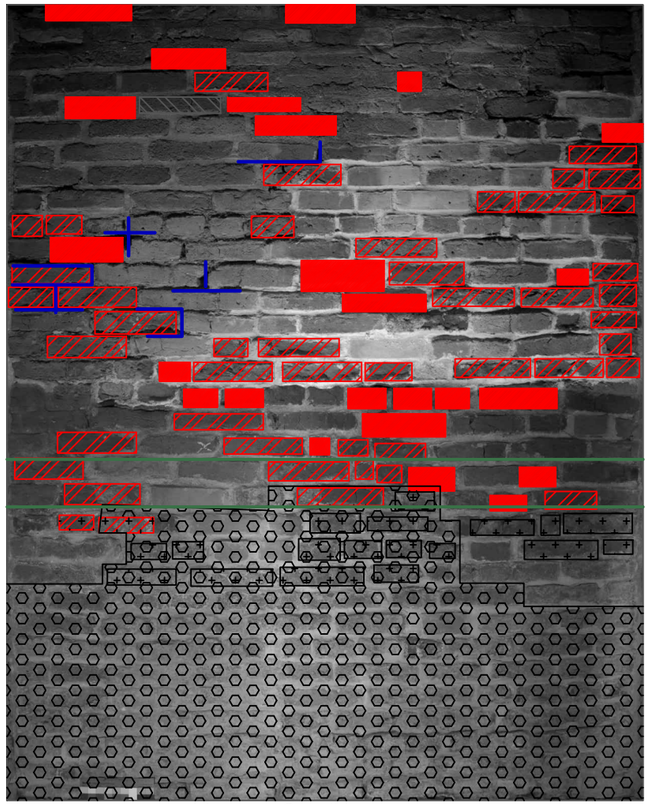
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

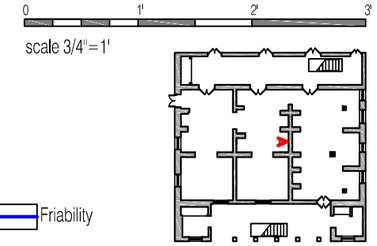
Room 280 Wall SE6



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

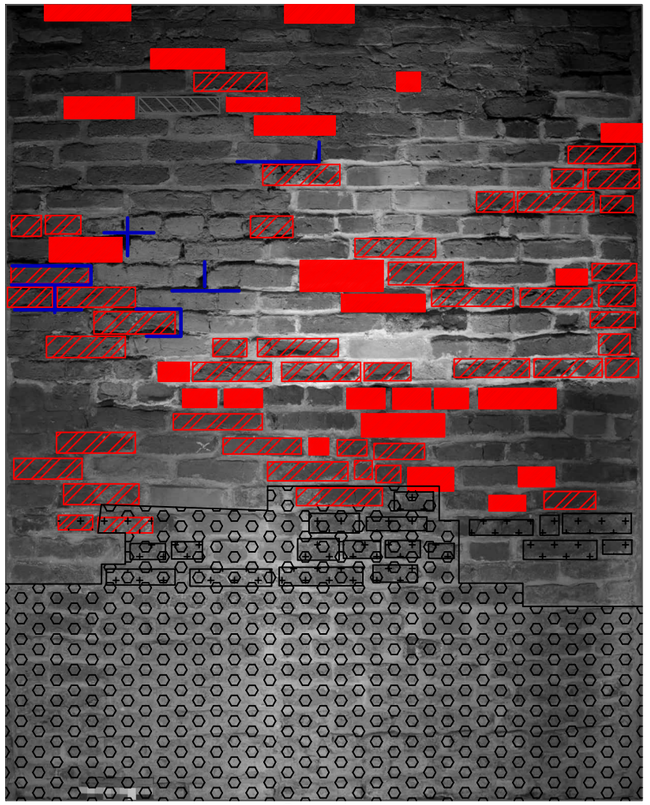
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

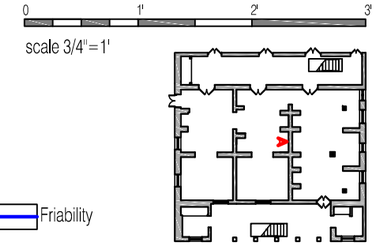
Room 280 Wall SE6



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

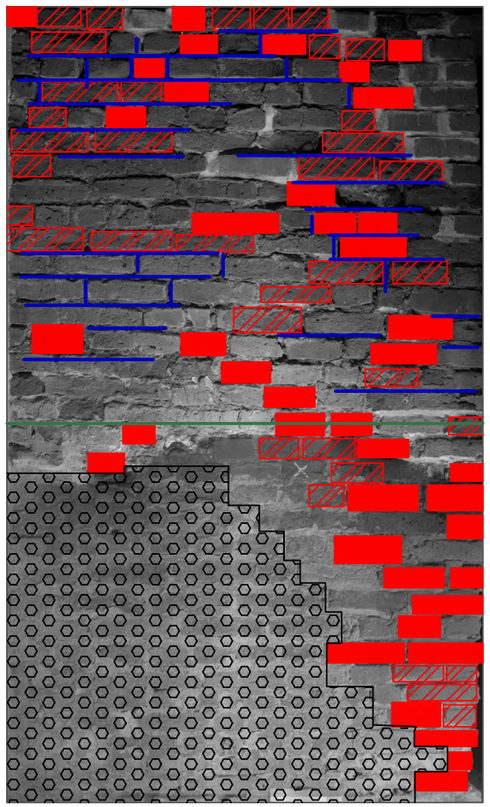
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall SW1



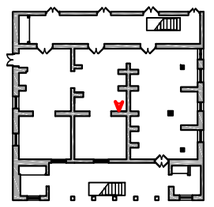
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

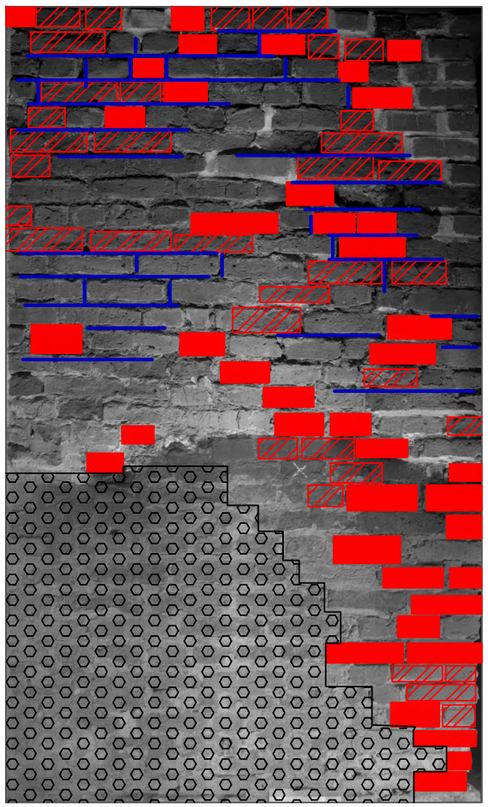
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall SW1



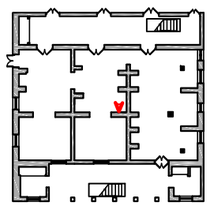
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

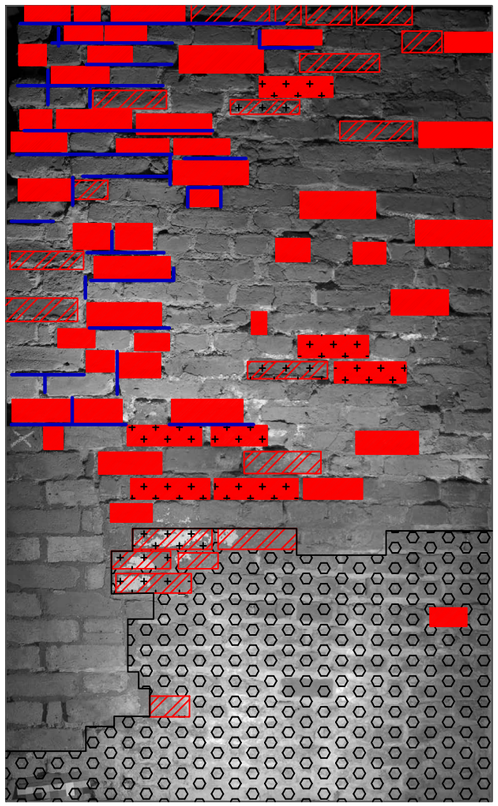
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

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632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall SW2



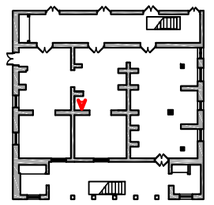
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

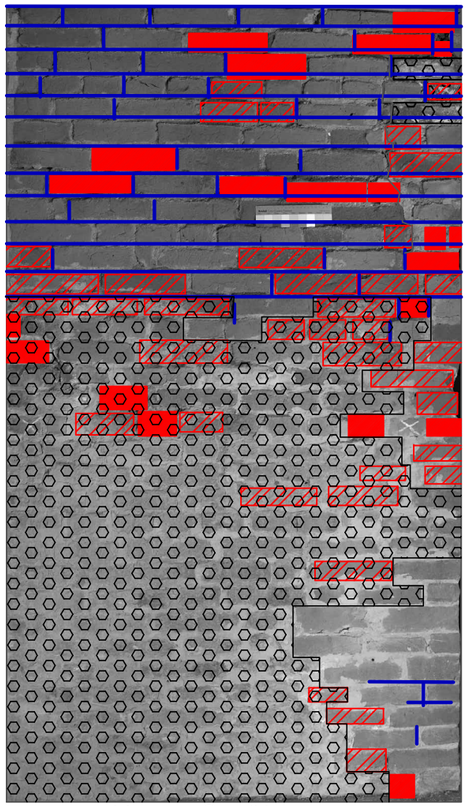
Date	August 27, 2013
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Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 279 Wall NE1



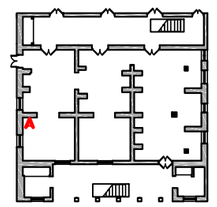
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

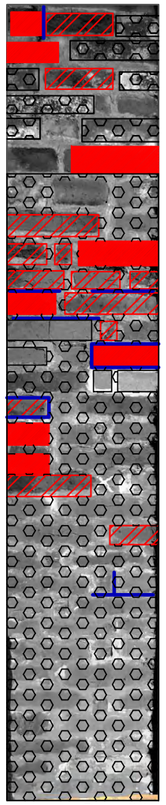
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

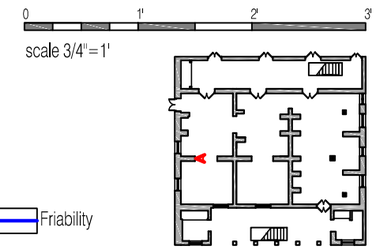
Room 279 Wall NE2



Masonry Conditions



Construction Campaigns



scale 3/4" = 1'

Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

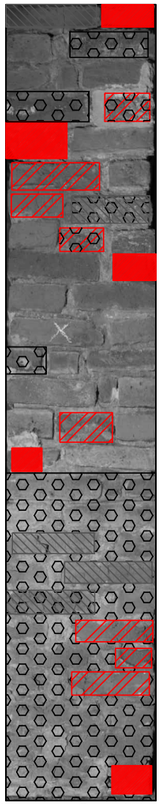
Date	August 27, 2013
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Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

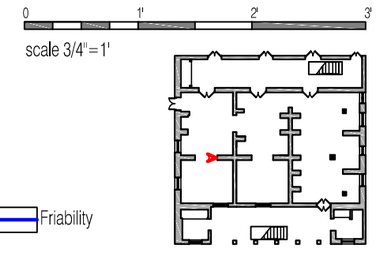
Room 279 Wall NE3



Masonry Conditions



Construction Campaigns



scale 3/4"=1'

Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

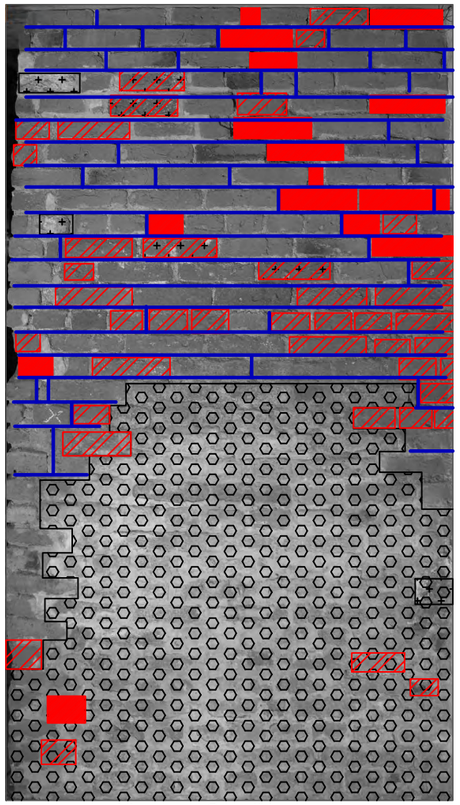
Date	August 27, 2013
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Madame John's Legacy

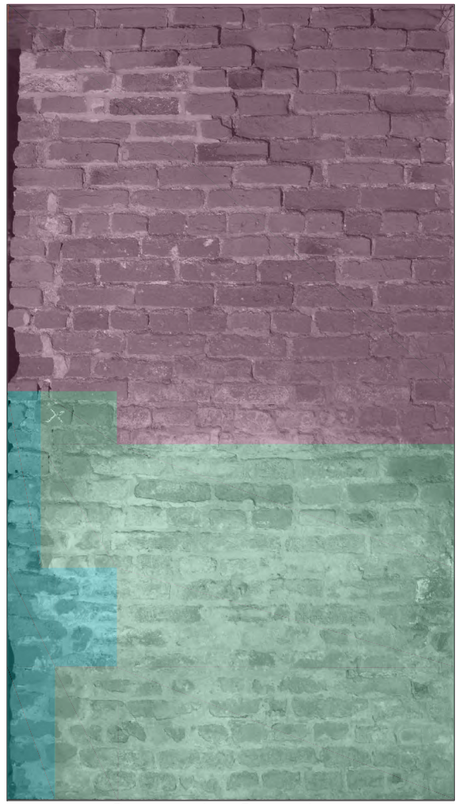
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

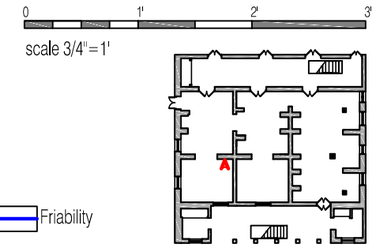
Room 279 Wall NE4



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

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632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 279 Wall NW1



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

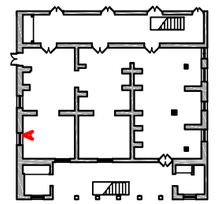
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



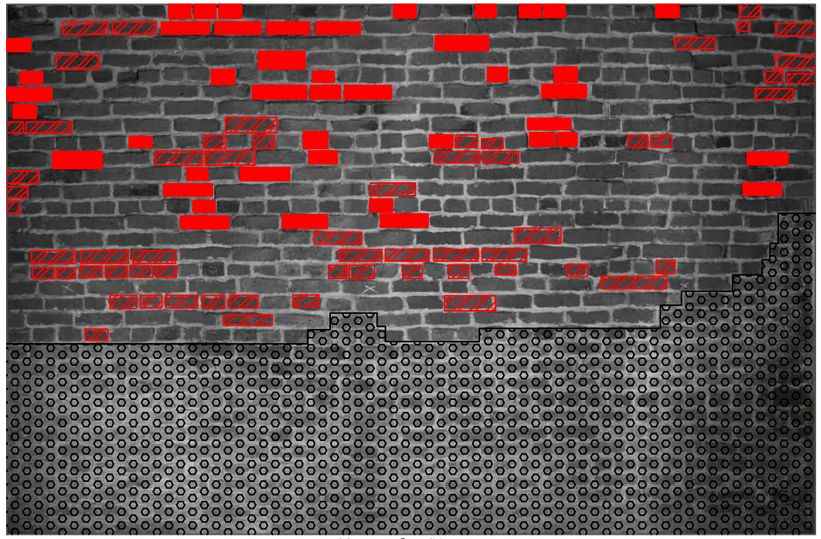
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

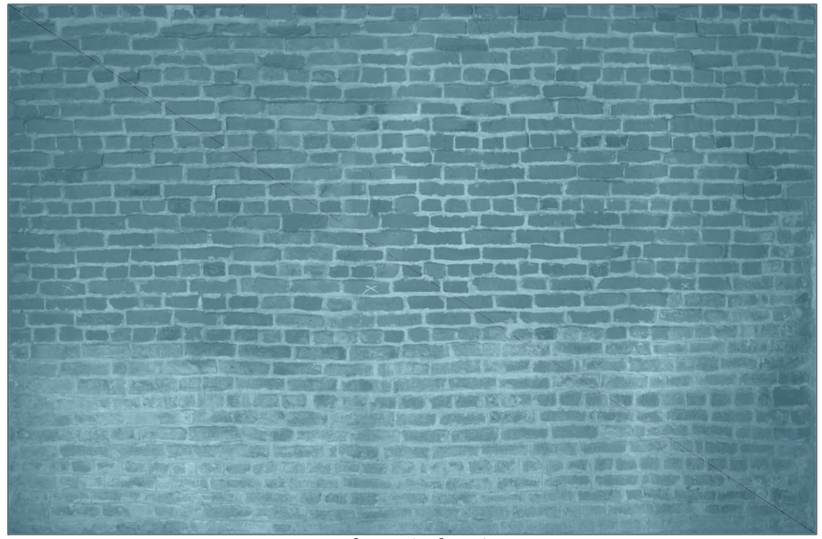
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 279 Wall SE1



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

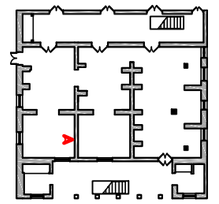
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



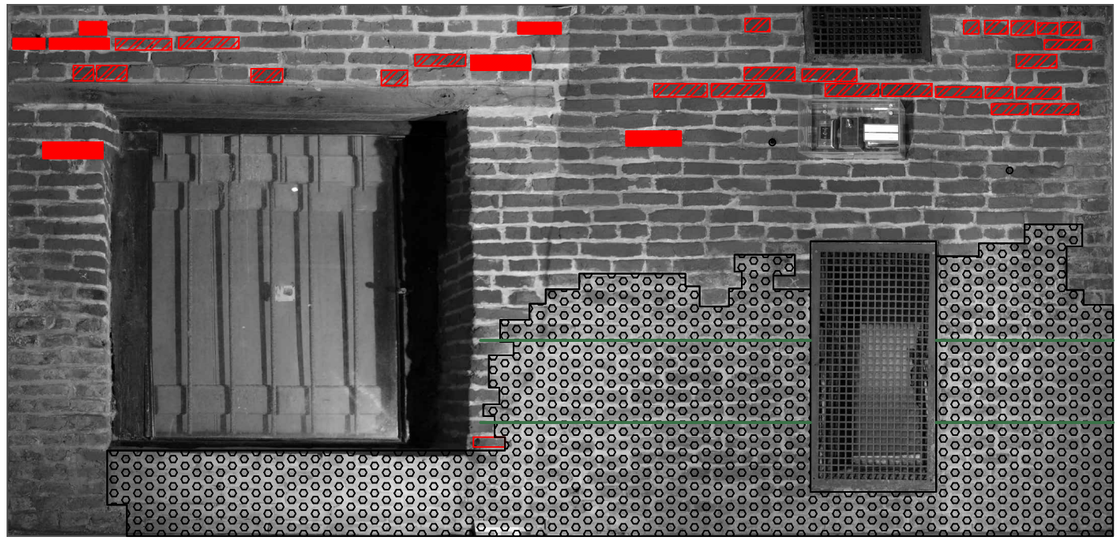
Date	August 27, 2013
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632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 279 Wall SW1



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

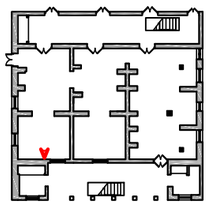
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



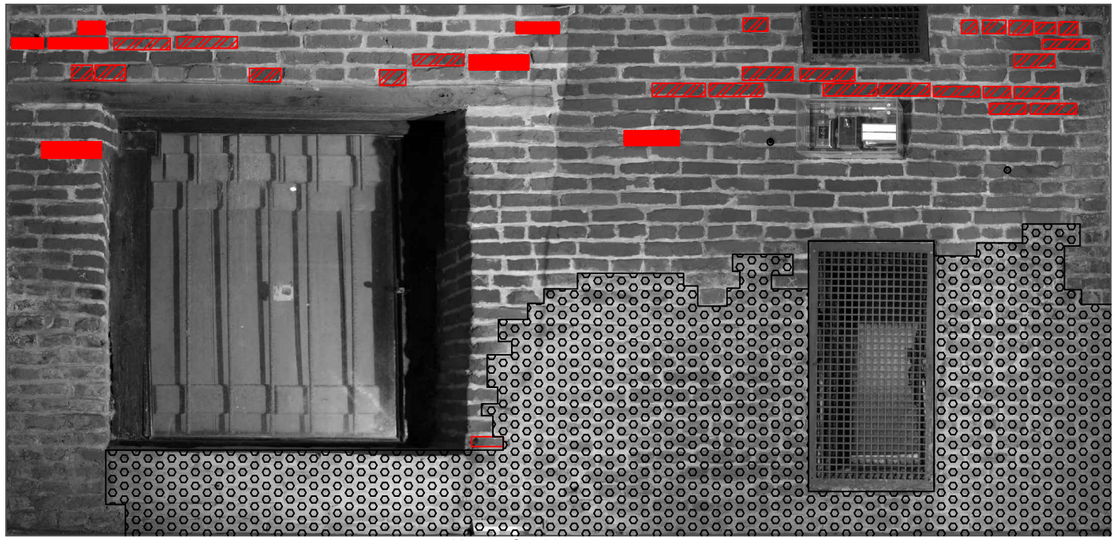
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 279 Wall SW1



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

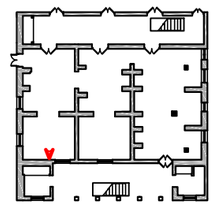
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



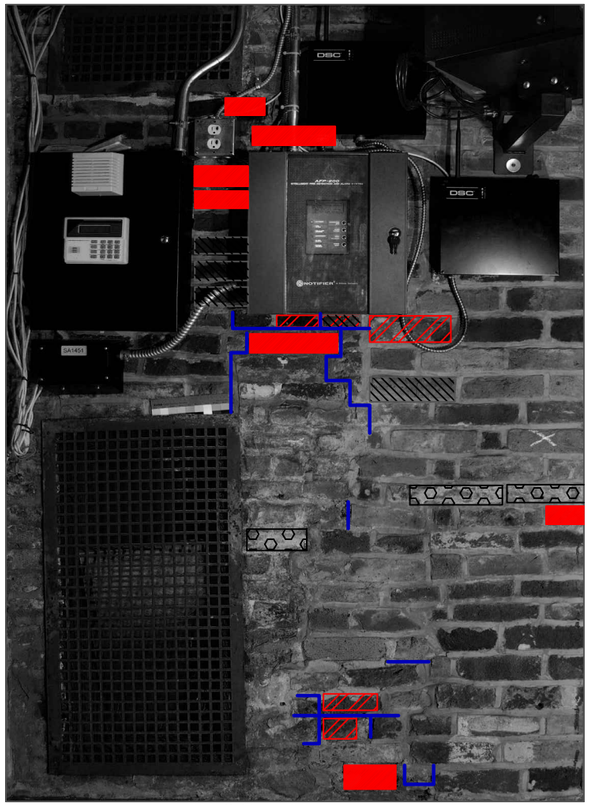
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 278 Wall NE1



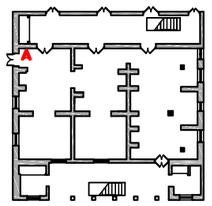
Wall Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

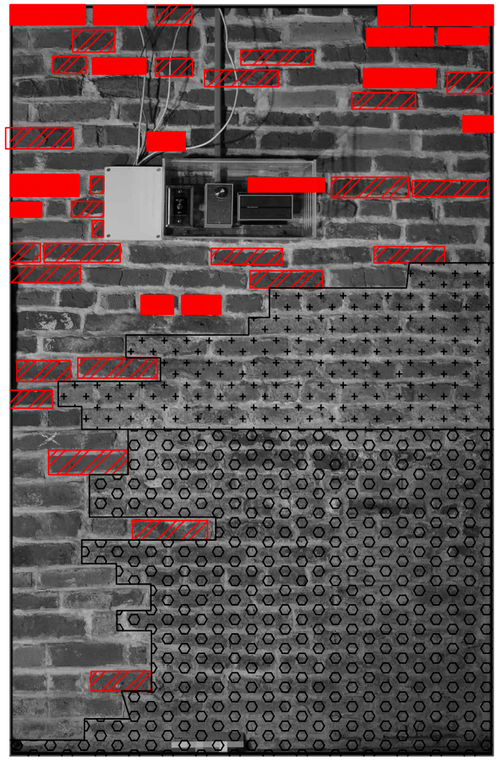
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

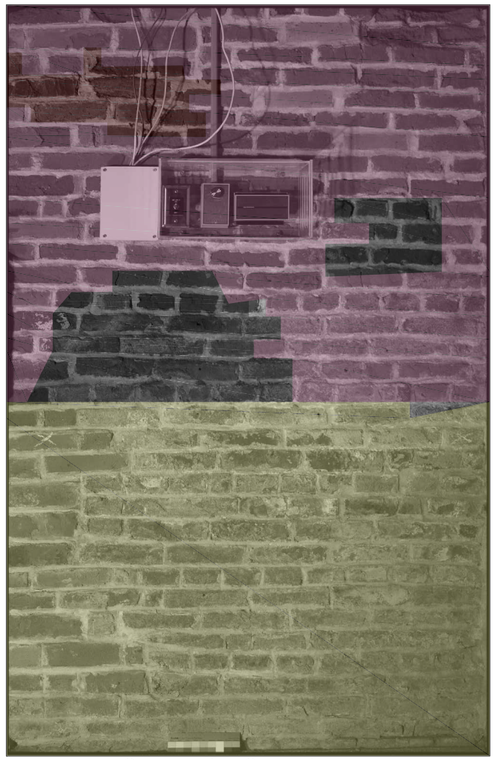
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 278 Wall NE2



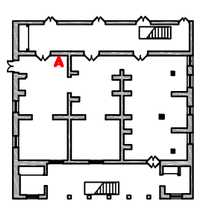
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 278 Wall NW1



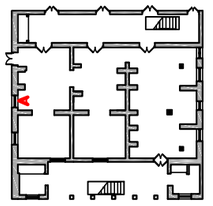
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

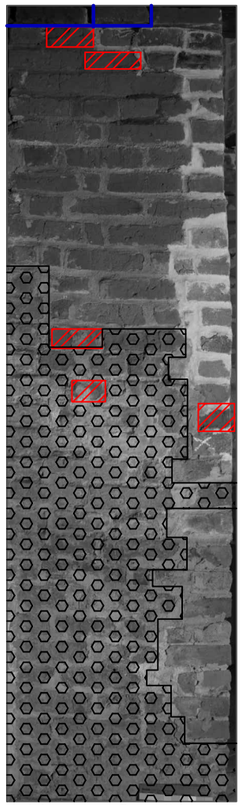
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 278 Wall NW2



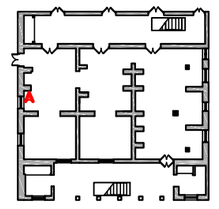
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
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Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

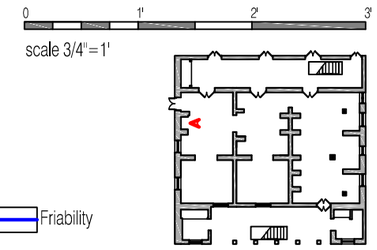
Room 278 Wall NW3



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

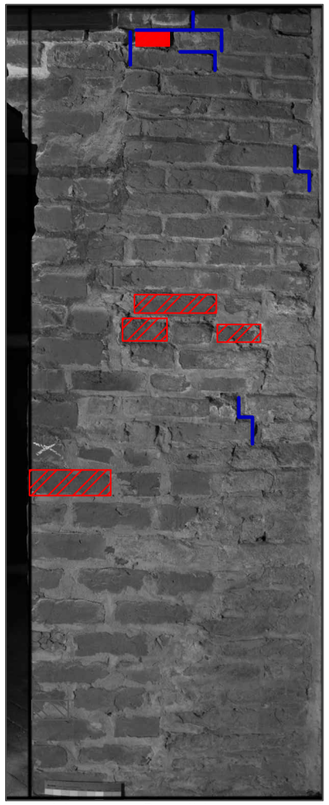
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

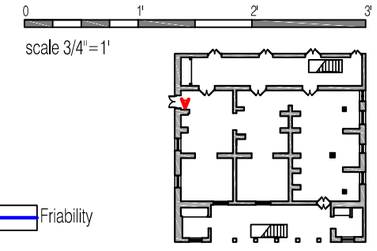
Room 278 Wall NW4



Masonry Conditions



Construction Campaigns



scale 3/4"=1'

Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 278 Wall NW5



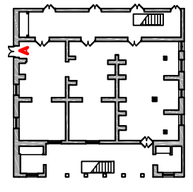
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4" = 1'



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

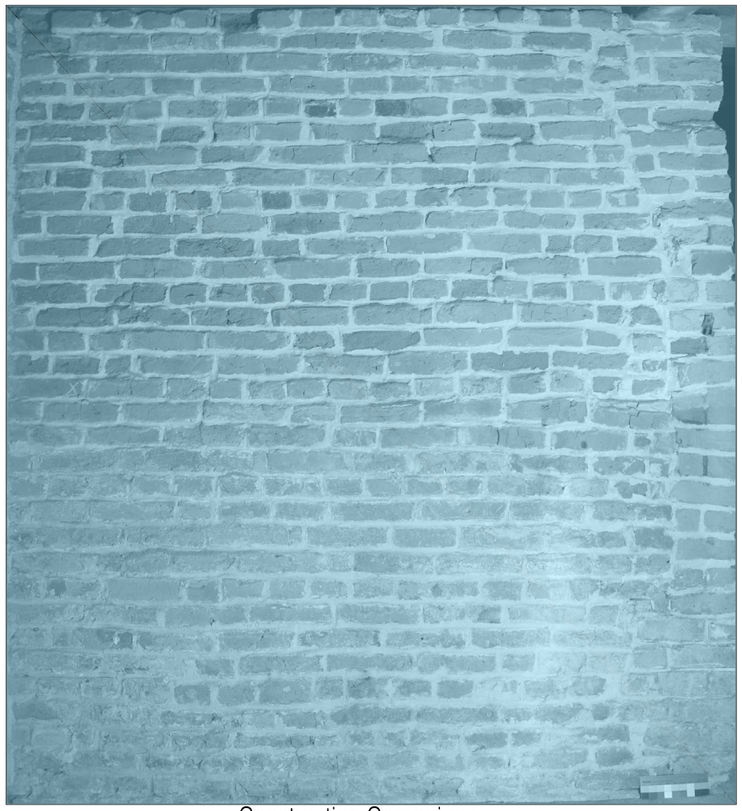
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 278 Wall SE1



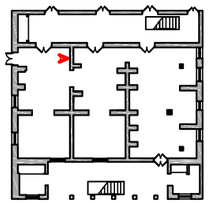
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

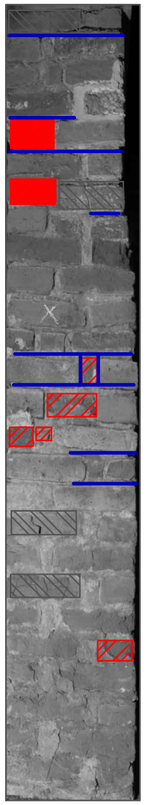
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

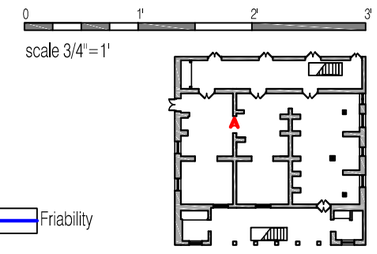
Room 278 Wall SE2



Masonry Conditions



Construction Campaigns



scale 3/4"=1'

Legend for Construction Campaigns

Earliest Existing
1948 Koch & Wilson
1972 Labouisse
1982 Brockway
1996 N-Y Associates
Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss
Major Surface Loss
Minor Efflorescence
Major Efflorescence
Visible Moisture
Through-Masonry Crack
Cracked Brick
Open Mortar Joint
Friability

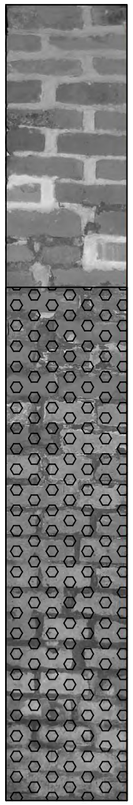
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

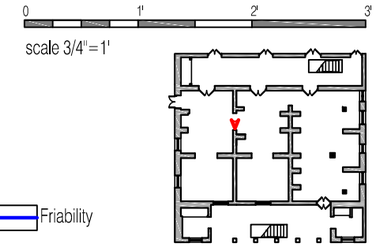
Room 278 Wall SE3



Masonry Conditions



Construction Campaigns



scale 3/4"=1'

Legend for Construction Campaigns

Earliest Existing
1948 Koch & Wilson
1972 Labouisse
1982 Brockway
1996 N-Y Associates
Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss
Major Surface Loss
Minor Efflorescence
Major Efflorescence
Visible Moisture
Through-Masonry Crack
Cracked Brick
Open Mortar Joint
Friability

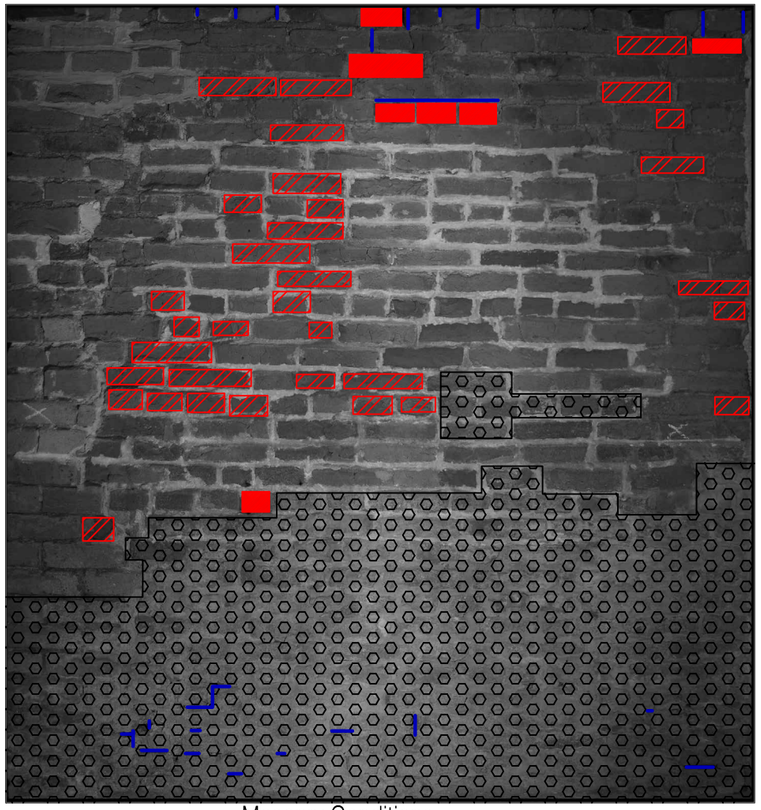
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Madame John's Legacy

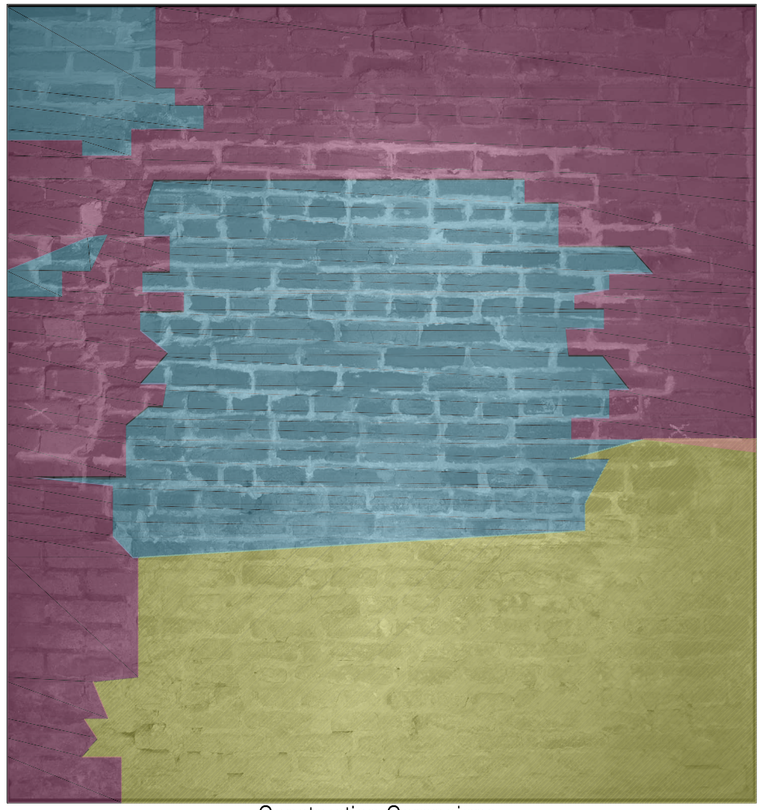
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

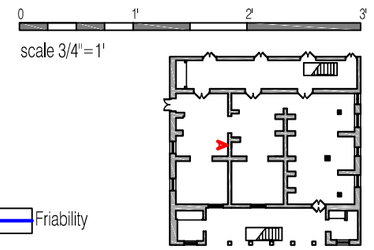
Room 278 Wall SE4



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

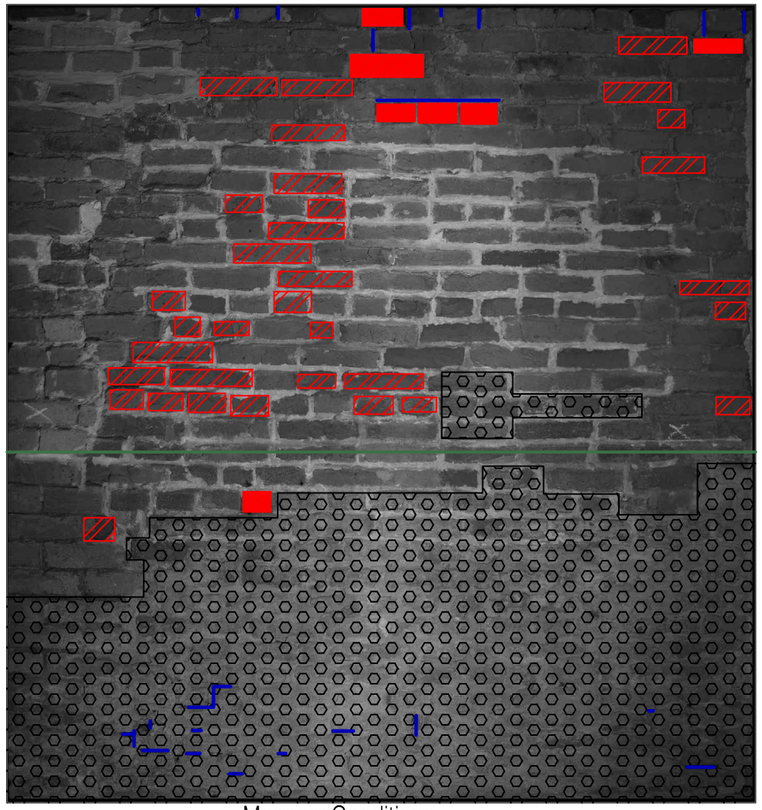
Date	August 27, 2013
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Madame John's Legacy

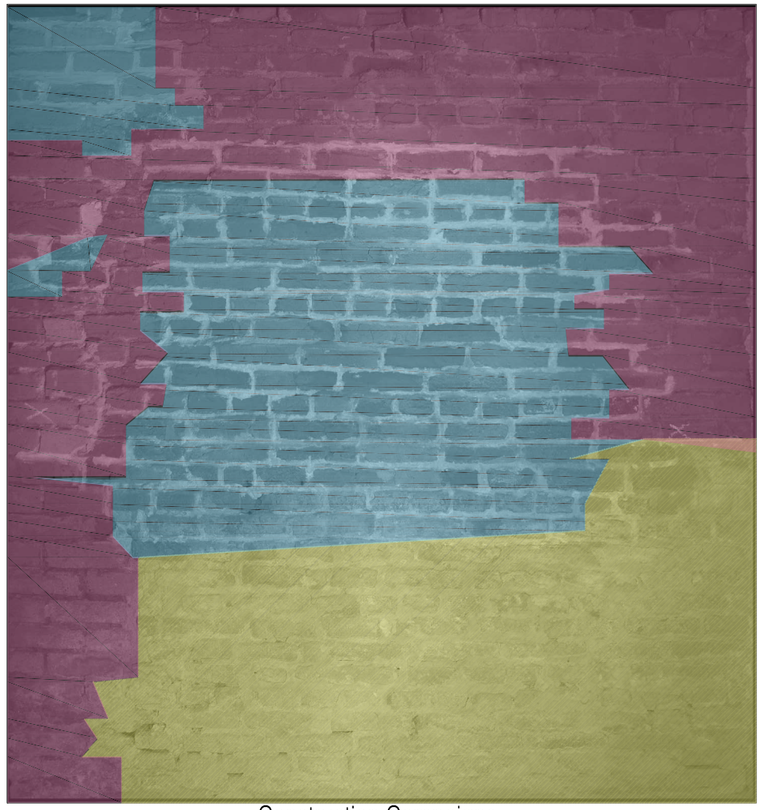
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

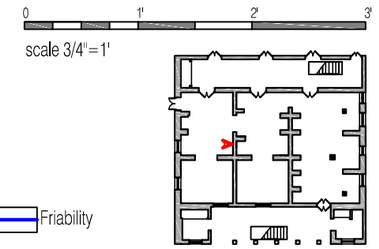
Room 278 Wall SE4



Masonry Conditions



Construction Campaigns



Legend for Construction Campaigns

Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

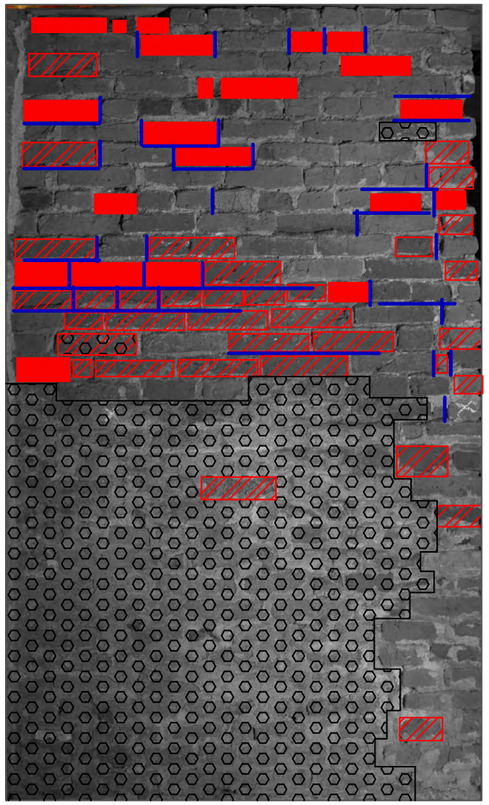
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

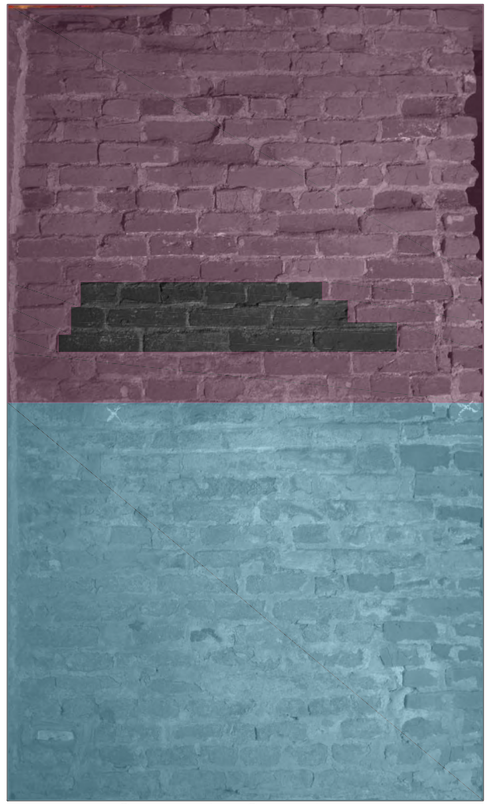
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 278 Wall SW1



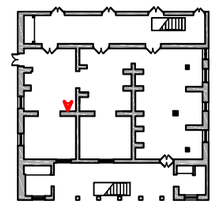
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

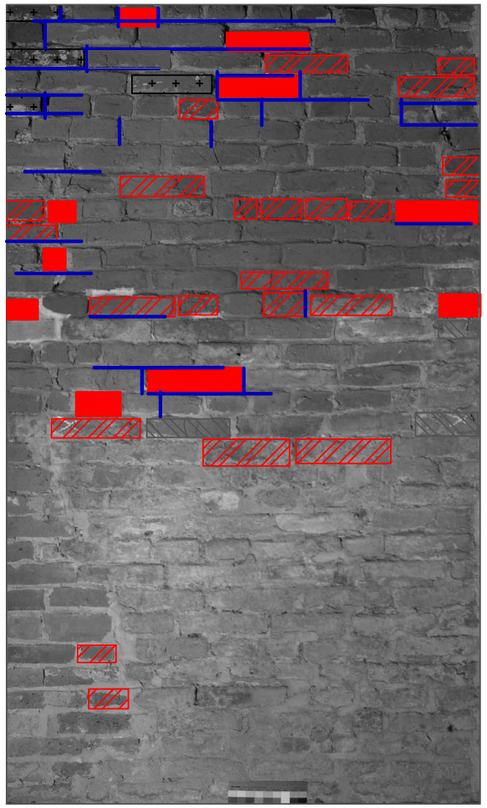
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

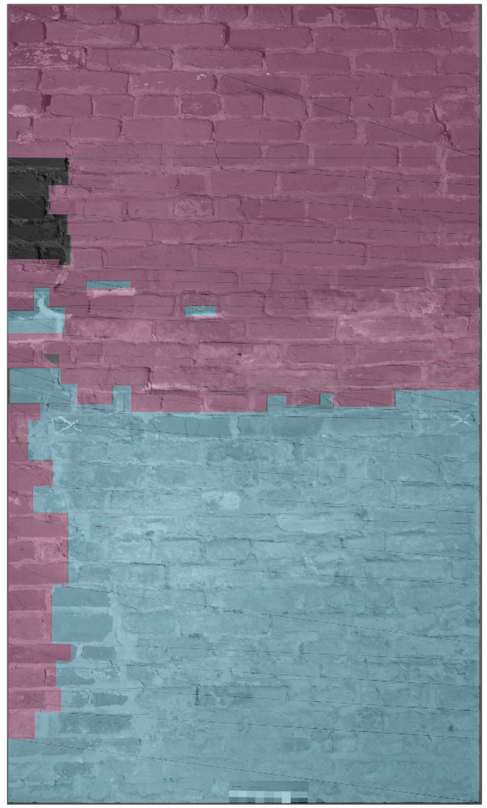
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 278 Wall SW2



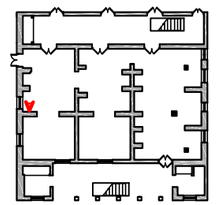
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4" = 1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

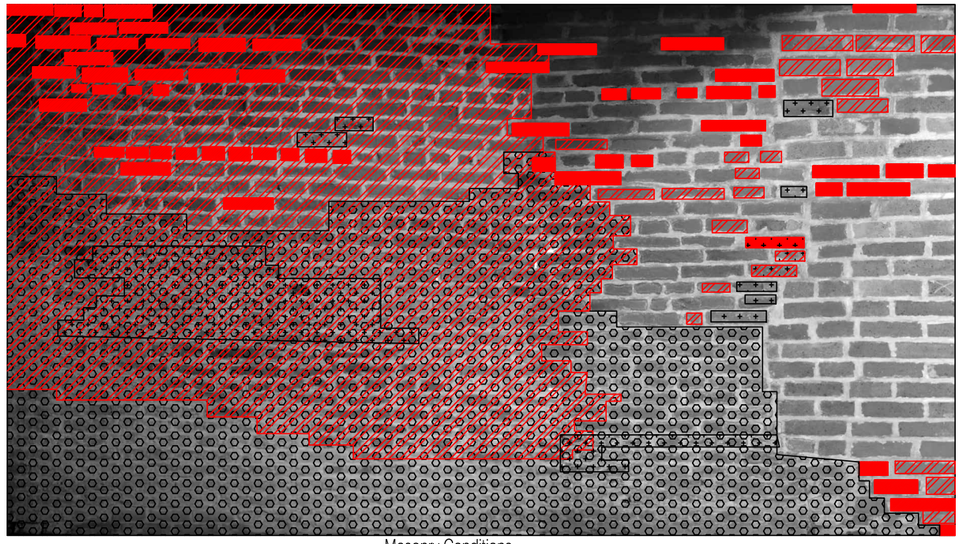
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 277 Wall SW1



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

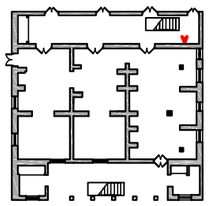
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



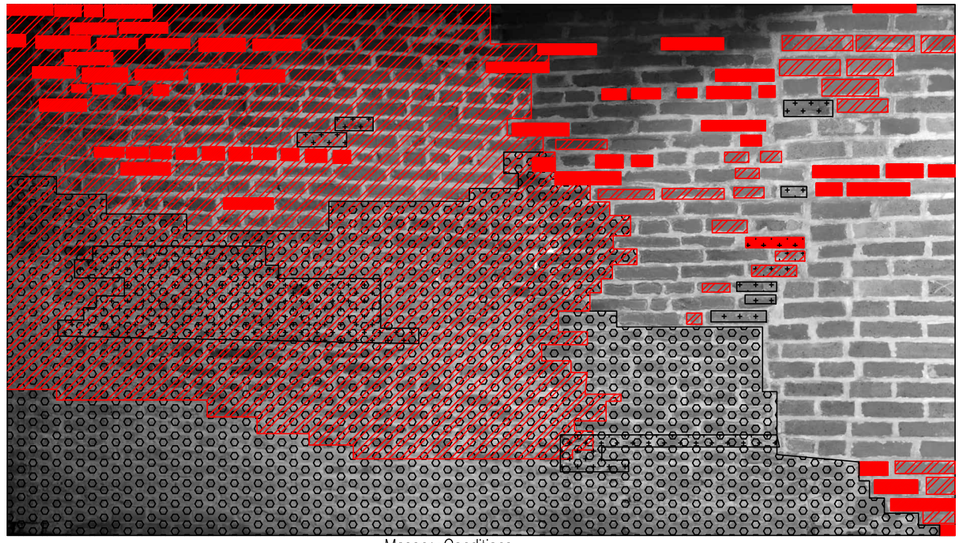
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 280 Wall SE6



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

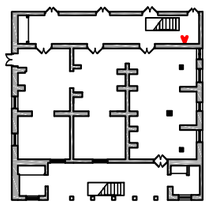
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



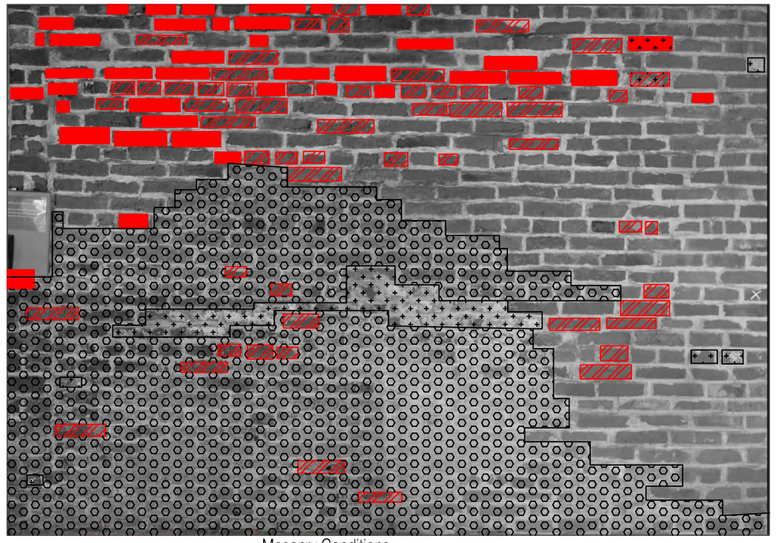
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 277 Wall SW2



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

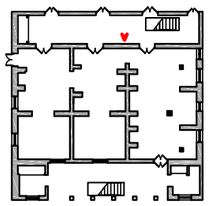
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



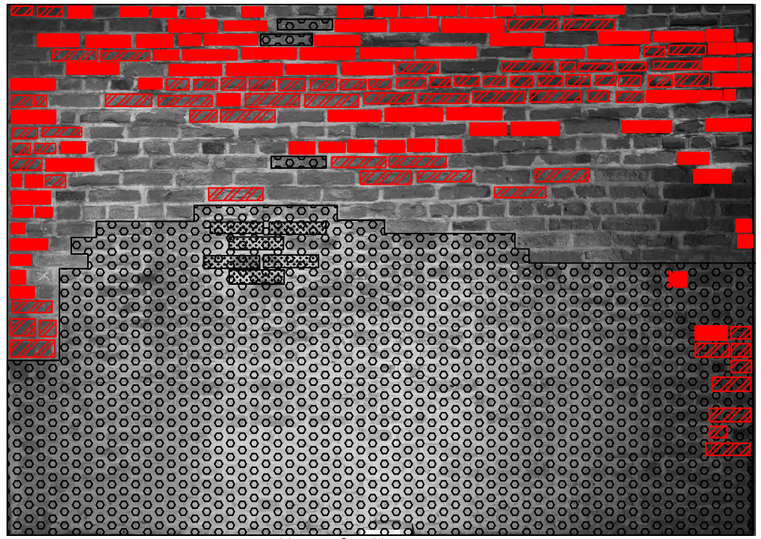
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 277 Wall SW3



Masonry Conditions



Construction Campaigns

Legend for Construction Campaigns

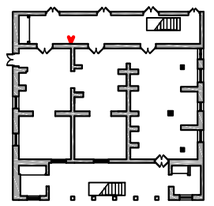
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

Minor Surface Loss | Major Surface Loss | Minor Efflorescence | Major Efflorescence | Visible Moisture | Through-Masonry Crack | Cracked Brick | Open Mortar Joint | Friability

0 1' 2' 3'

scale 1/2" = 1'



Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

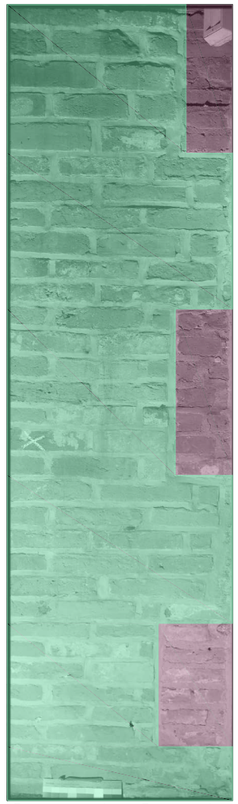
632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 277 Wall SW4



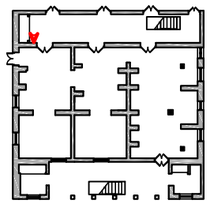
Masonry Conditions



Construction Campaigns

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Masonry Conditions

- Minor Surface Loss
- Major Surface Loss
- Minor Efflorescence
- Major Efflorescence
- Visible Moisture
- Through-Masonry Crack
- Cracked Brick
- Open Mortar Joint
- Friability

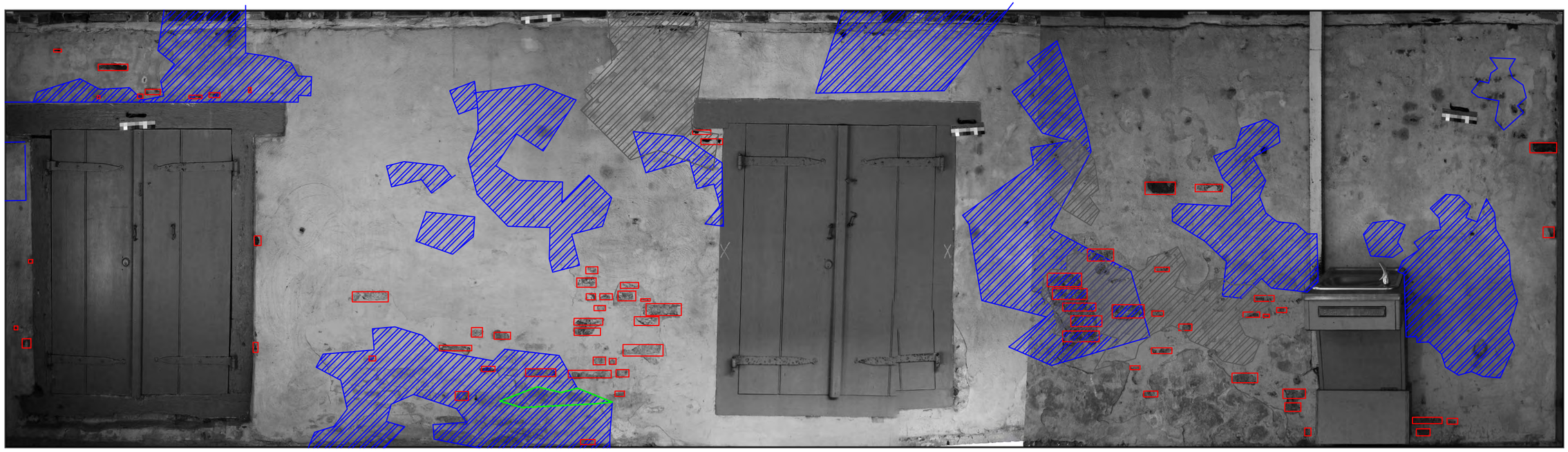
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 285 Wall NE1



Stucco Conditions

Legend for Construction Campaigns

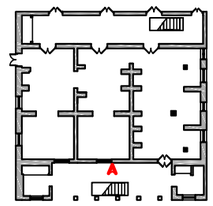
- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Stucco Conditions

- Detached Top Coat
- Detached Under Coat
- Loss of Top Coat
- Exposed Brick
- Visible Moisture
- Crack in Stucco

0 1' 2' 3'

scale 1/2" = 1'



Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 285 Wall NW1



Stucco Conditions

Legend for Construction Campaigns

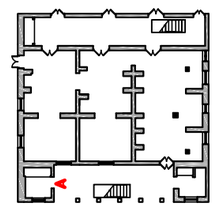
- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Stucco Conditions

- Detached Top Coat
- Detached Under Coat
- Loss of Top Coat
- Exposed Brick
- Visible Moisture
- Crack in Stucco

0 1' 2' 3'

scale 3/4"=1'



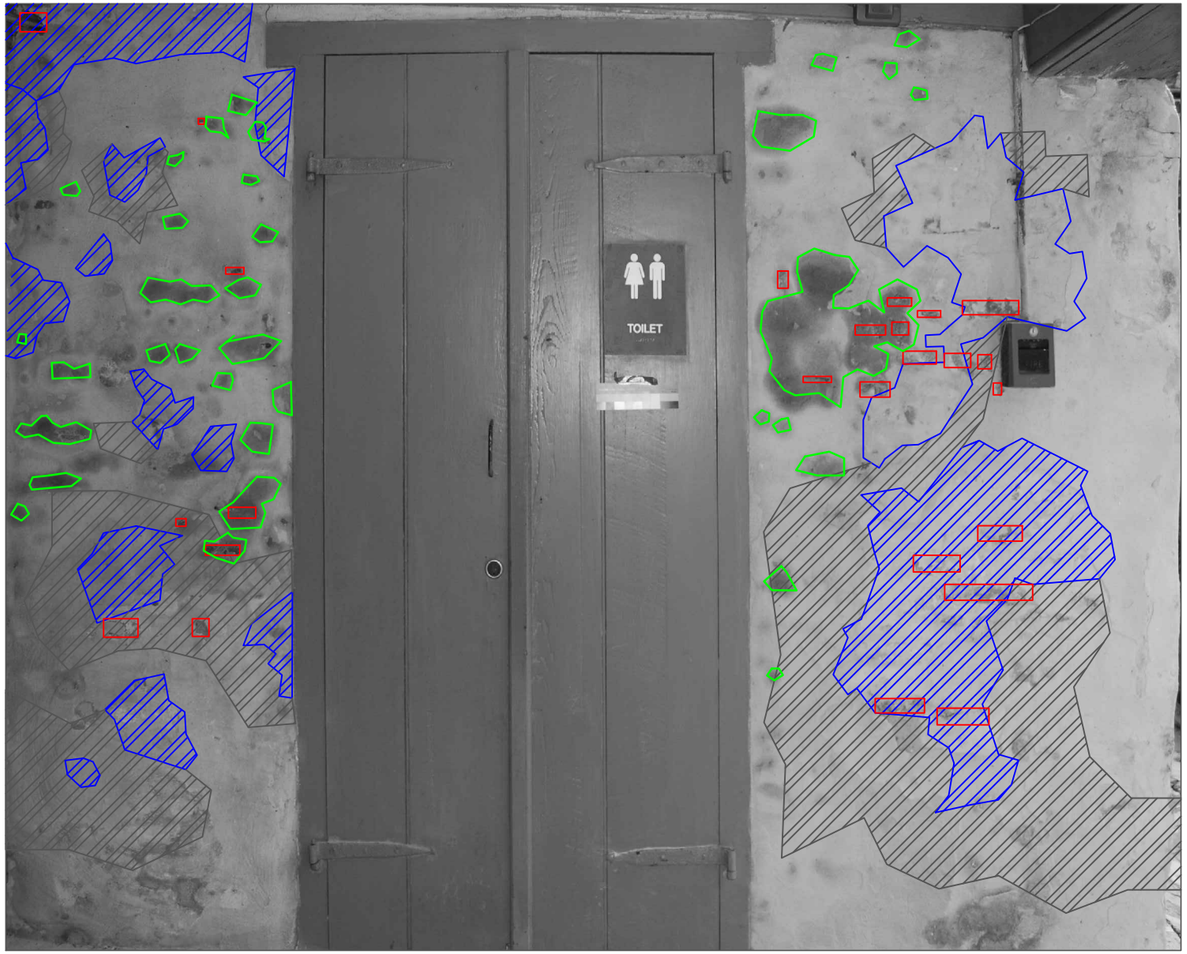
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Room 285 Wall SE1



Stucco Conditions

Legend for Construction Campaigns

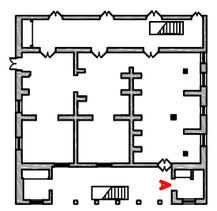
Earliest Existing
1948 Koch & Wilson
1972 Labouisse
1982 Brockway
1996 N-Y Associates
Light Grey Spot Pointing- Date Unknown

Legend for Stucco Conditions

Detached Top Coat
Detached Under Coat
Loss of Top Coat
Exposed Brick
Visible Moisture
Crack in Stucco

0 1' 2' 3'

scale 3/4" = 1'



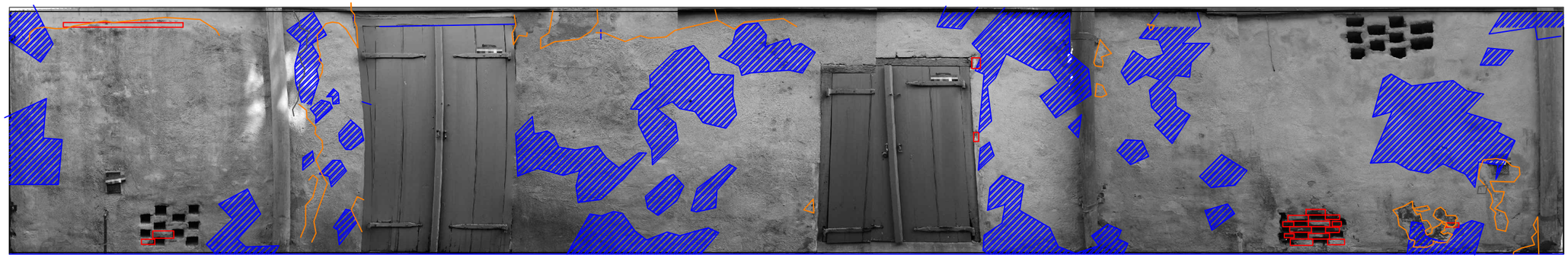
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

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Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Alley Wall SE1



Stucco Conditions

Legend for Construction Campaigns

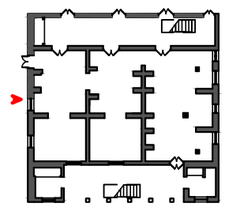
- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Stucco Conditions

- Detached Top Coat
- Detached Under Coat
- Loss of Top Coat
- Exposed Brick
- Visible Moisture
- Crack in Stucco

0 1' 2' 3'

scale
1/4"=1'



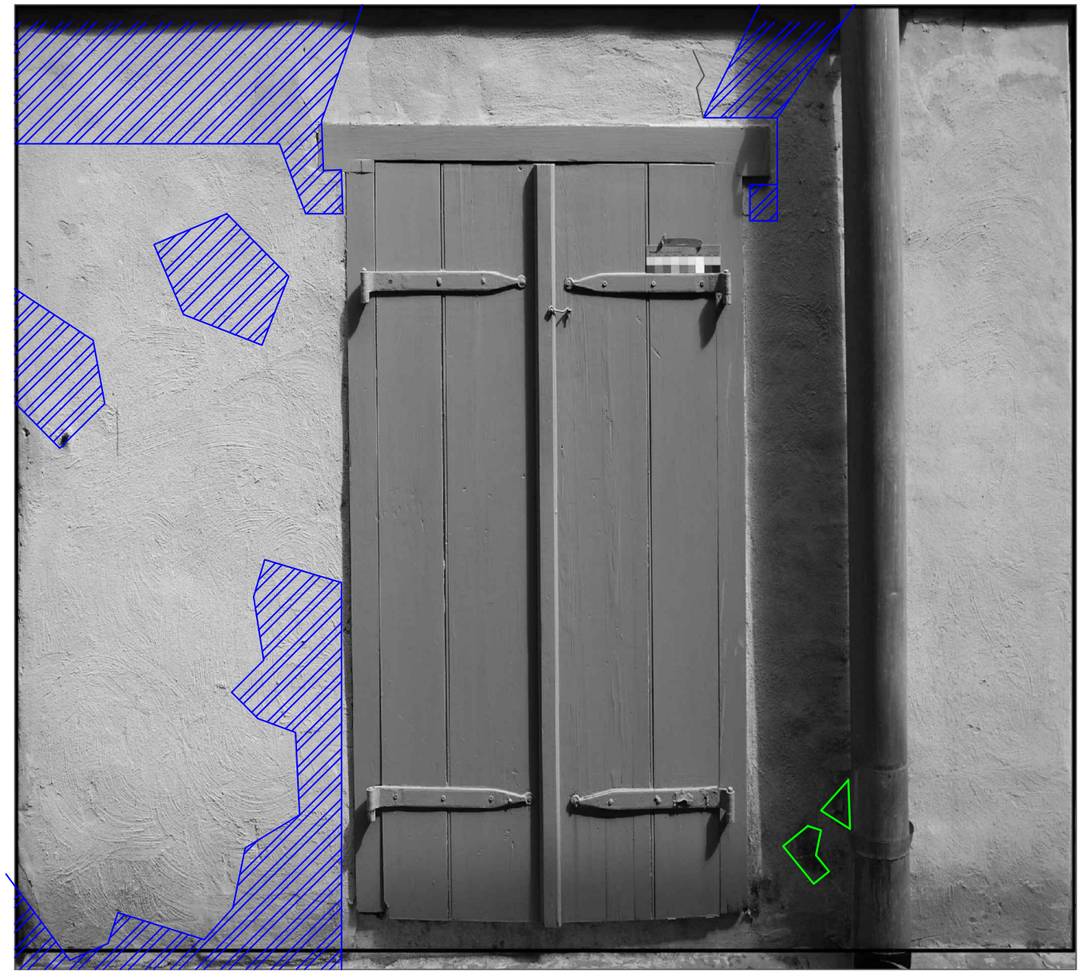
Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

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Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Courtyard 287 Wall NE1



Stucco Conditions

Legend for Construction Campaigns

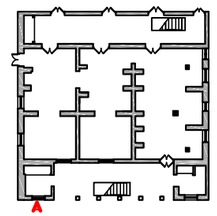
Earliest Existing | 1948 Koch & Wilson | 1972 Labouisse | 1982 Brockway | 1996 N-Y Associates | Light Grey Spot Pointing- Date Unknown

Legend for Stucco Conditions

Detached Top Coat | Detached Under Coat | Loss of Top Coat | Exposed Brick | Visible Moisture | Crack in Stucco

0 1' 2' 3'

scale 3/4"=1'



Friability

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

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Documentation of Brick Masonry Wall Conditions and Construction Campaigns

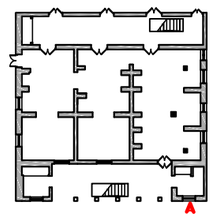
Courtyard 287 Wall NE2



Stucco Conditions

0 1' 2' 3'

scale 3/4"=1'



Legend for Construction Campaigns

- Earliest Existing
- 1948 Koch & Wilson
- 1972 Labouisse
- 1982 Brockway
- 1996 N-Y Associates
- Light Grey Spot Pointing- Date Unknown

Legend for Stucco Conditions

- Detached Top Coat
- Detached Under Coat
- Loss of Top Coat
- Exposed Brick
- Visible Moisture
- Crack in Stucco

Date	August 27, 2013
Drawn by	Photographs by Yvette Tyler Digitized conditions by Sarahgrace Godwin

Madame John's Legacy

632 Dumaine Street, New Orleans, LA, 70116

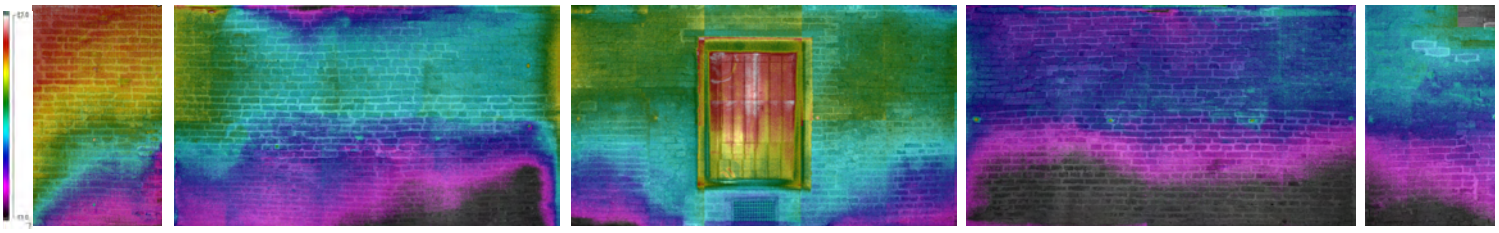
Documentation of Brick Masonry Wall Conditions and Construction Campaigns

Appendix C.

Preliminary Thermographic Survey of Madame John's Legacy. New Orleans, LA. August 26, 2013

(Cypress Building Conservation)

CYPRESS
BUILDING CONSERVATION



281-NE4 281-SE1 281-SW1 281-NW1 281-NE1

Preliminary Thermographic Survey of Madame John's Legacy, New Orleans, LA

Michael Shoriak and Courtney Williams
Architectural Conservators

cypressbuildingconservation.com
shoriak@cypressbuildingconservation.com
225-936-2680

August 26, 2013

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PROJECT SUMMARY	1
PURPOSE	1
INFRARED CAMERA SPECIFICATIONS	1
RESULTS	2-3
INFRARED IMAGES OF ROOM 281	4-10

PROJECT SUMMARY

This report describes the preliminary thermographic survey results of the brick first floor walls of Madame John's Legacy located in the French Quarter of New Orleans, LA. This work was completed by Cypress Building Conservation over a period of three days from Monday, August 5 to Wednesday, August 7, 2013. The thermographic survey was completed in conjunction with the installation of 3 temperature and relative humidity sensors in the wall core and a soil moisture sensor at the base of wall 281-NE4. The readings from these sensors will be used to determine the effectiveness of infrared thermography to map the internal moisture content of the brick walls using surface temperatures.

The results of this survey show temperature patterns occurring on each of the five wall surfaces in room 281. Cooler areas are represented by violets and blues while warmer areas are indicated by yellows and reds. The temperatures represented in all of the images are scaled to between 81° and 87° Fahrenheit. Areas near the bottom of the walls where there is no color have surface temperatures below 81° Fahrenheit.

PURPOSE

The moisture mapping methods in this report provide the Louisiana State Museum with a non-destructive testing procedure to locate moisture infiltration through the surface of the brick walls. Thermal cameras measure the amount of emitted thermal energy from a material surface. The camera software the generates a temperature map based on the amount of emitted thermal energy that reaches the camera sensor. Wall surfaces with large thermal differences between two connected elements or areas are an indication moisture content variances. Surfaces with areas of increasing moisture content appear as cooler areas in the infrared images due to the effects of evaporation (surface cooling). After moisture infiltrates the wall, it evaporates leaving efflorescence or salt crystallization on the brick surface. Salt crystallization, on the interior and exterior of the porous brick and original mortars, has caused accelerated damage. Determining the patterns of moisture infiltration across wall surfaces will provide the Louisiana State Museum with a method to develop conservation treatments to stop further efflorescence from occurring. Additionally, scaled infrared images captured of the wall surfaces under different environmental conditions will provide the Louisiana State Museum with a nondestructive method to test how changes in the exterior and interior environment affect moisture infiltration and salt deposition on the brick surface.

INFRARED CAMERA SPECIFICATIONS

The camera used for all infrared imaging was the FLUKE Ti32 Thermal Imager. This camera has a 320 x 240 uncooled micobolometer focal plane array and the temperature measurement range for this camera is -20°C - 600°C with an accuracy of +/- 2° C at 25° C. The thermal sensitivity of the camera allows for 76,800 individual temperature measurements and the detection of temperature variations of .004° C on a sample surface. This camera has a field of view of 23' x 17' and a minimum focus distance of 18". The Fluke Ti32 camera captures both an infrared thermogram of emitted thermal energy between 7.5 µm to 14 µm wavelengths and also a visible light image of the same field of view. FLUKE cameras have a patented IR Fusion technology that allows for the storing of a full visual image which can be displayed, blended and stored with each IR image. Thermal and visual images can be presented simultaneously as a full infrared image or as a Picture-In-Picture (PIP) image in various blend modes. This feature greatly enhances the ability to depict both real time and computer enhanced thermographic images allowing for the isolation of thermal anomalies on a sample surface.



Figure 1: A digital photograph and infrared image of wall 281-NE4 showing sensor locations. The sections of the wall in violet and blue indicate areas of higher moisture content of the wall.

RESULTS

Initial testing results show that infrared thermography is capable of mapping the moisture content of brick walls by mapping the surface temperature of the test wall.

In order to create a high resolution infrared image of the test wall, a series of infrared images was taken of each wall surface and scaled to show temperatures between 81° and 87° Fahrenheit. These images were then tiled over a high resolution digital photograph of the wall surface to create a single infrared image of each wall.

The infrared image in Figure 1 shows surface temperatures of wall 281-NE4 as well as the core locations where temperature and relative humidity sensors were installed inside the wall cavity. Figure 2 shows the installed sensors in wall 281-NE4 as well as the soil moisture sensor installed at the base of the wall.

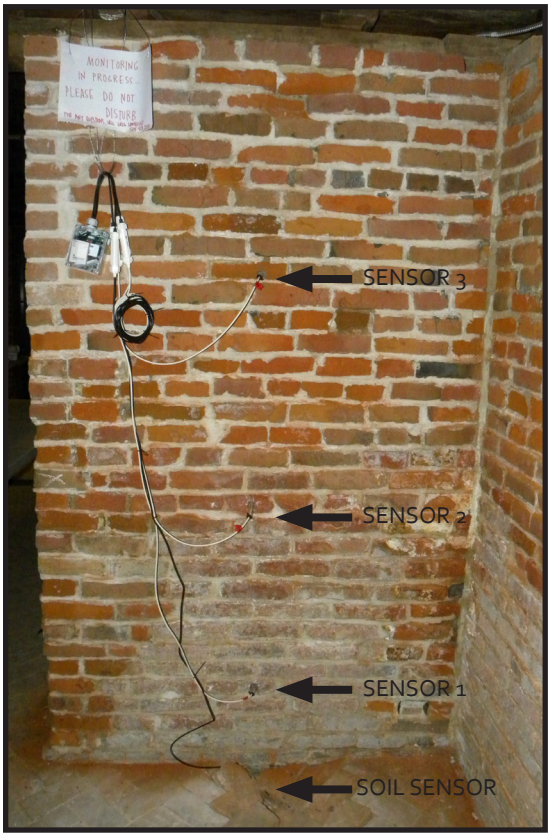


Figure 2: Photograph showing the testing assembly and installed temperature, relative humidity and a soil moisture sensors.

SENSOR
LOCATION

Initial sensor readings taken at the time of the thermographic survey on August 7, 2013 gives the following results: Sensor 1 @ 11" above the finished floor 74.95° F/ 99.8% RH; Sensor 2 @ 35" above the finished floor 75.92° F/ 99.8% RH; Sensor 3 @ 61" above the finished floor 76.78° F/ 67.8% RH. The temperatures measured on the interior of the wall are lower than those at the wall surface as indicated by the infrared image. However, the gradient of temperatures follows the same pattern of lower temperatures at the base of the wall with rising temperatures moving up the surface of the wall.

Continued and consistent use of thermal imagery is necessary in order to detect changes in moisture content in wall 281-NE4. Additional infrared images correlated to wall sensor data will allow for comparisons between wall sensor and infrared data over time and under changing conditions. Following future testing that shows a correlation between wall sensor and infrared data, the Louisiana State Museum can use this technique to determine the potential cases of moisture infiltration and also test proposed conservation interventions to slow salt crystallization and deterioration of the brick walls.

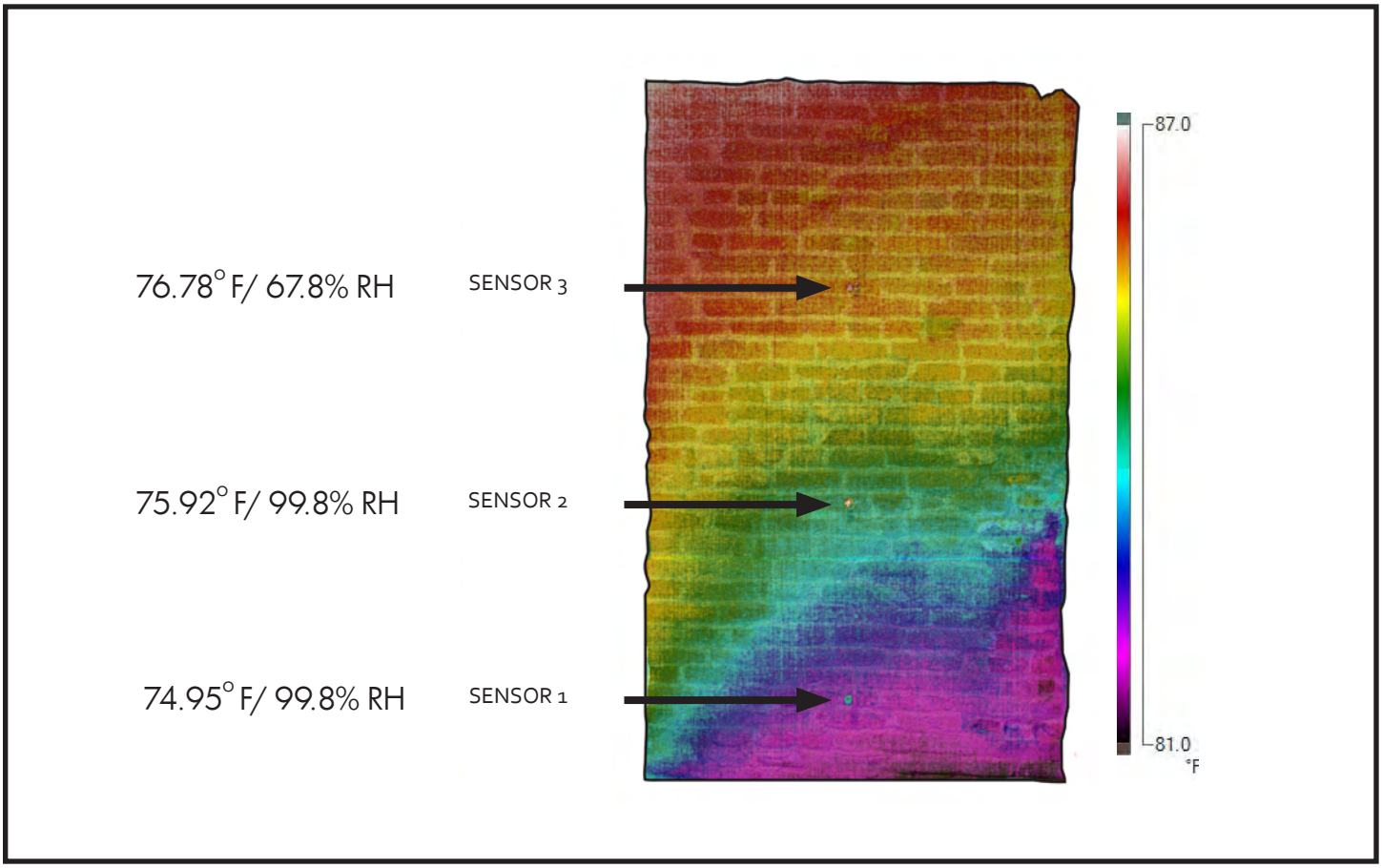


Figure 3: Infrared image of wall 281-NE4 showing sensor locations with temperature and relative humidity values for each sensor on August 7, 2013. The core of the wall is cooler than the exterior surface, however, there appears to be a correlation between surface temperature and moisture content.

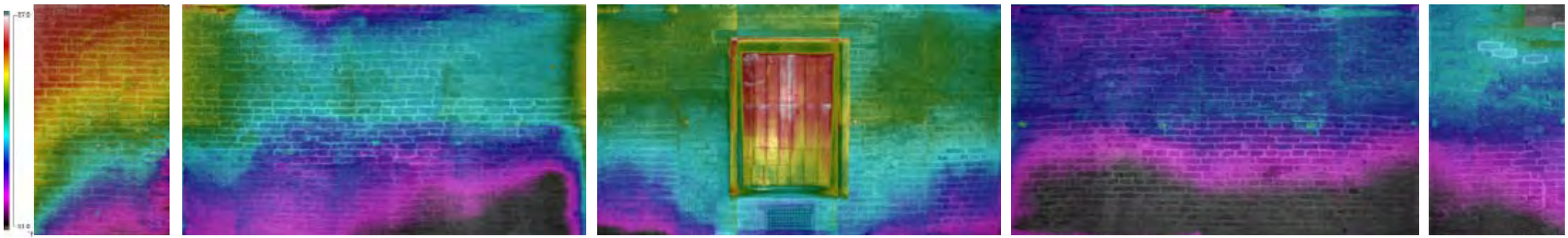
THERMAL IMAGES OF ROOM 281

The following layouts depict surface temperatures on the five walls of room 281. All of the walls exhibit similar surface temperature patterns with the coolest portion of the wall surface being the base of each wall. The two long interior wall sections, 281-SE1 and 281-NW1, display the largest surface areas with temperatures below 81° F. Cooler temperatures are also found at the tops of these wall sections, possibly due to cool air falling from the climate controlled second level. The exterior wall in this room, wall section 281-SW1, has on average a higher surface temperature than the rest of the room. This is due to external heating of the exterior wall surface which has moved by conduction through the wall cavity to the interior wall surface. The highest surface temperatures are found on the test wall section 281- NE4. Continued monitoring of these wall sections using infrared thermography and sensor data will help to better understand the effect of the external environment on the location of moisture infiltration in the wall cavities under different environmental conditions.

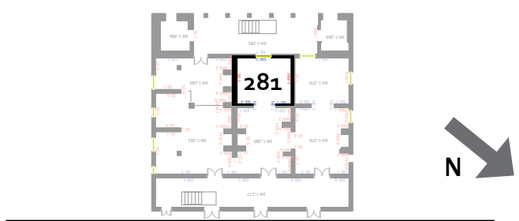
DIGITAL PHOTOGRAPHS



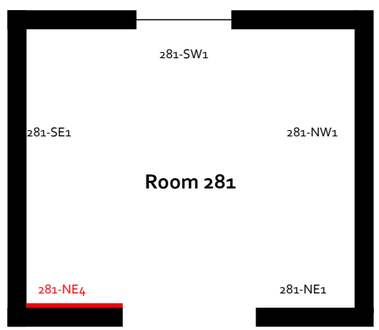
INFRARED IMAGE OVER PHOTOGRAPHS



281-NE4 | 281-SE1 | 281-SW1 | 281-NW1 | 281-NE1



FIRST FLOOR



Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 Dumaine Street, New Orleans, LA, 70116

room #

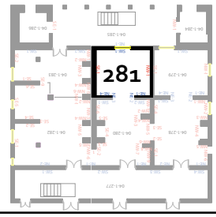
281

DIGITAL PHOTOGRAPH



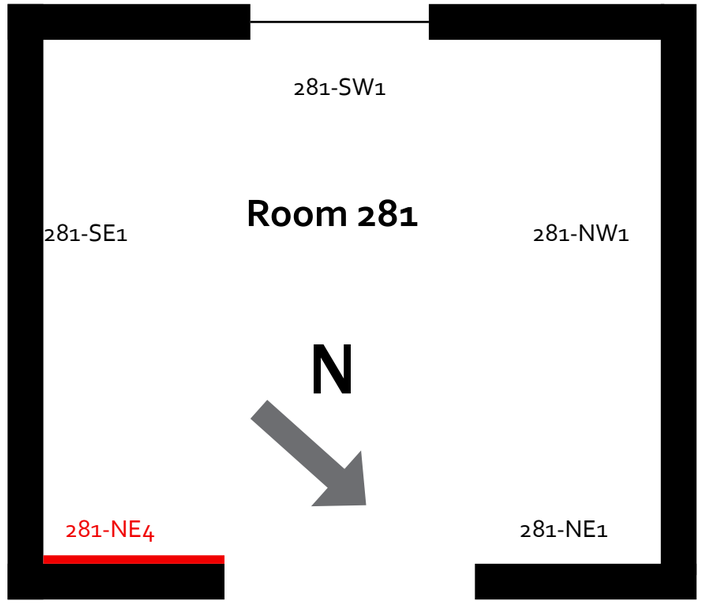
INFRARED IMAGE OVER PHOTOGRAPH





DUMAINE STREET

FIRST FLOOR



Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 DUMAINE STREET, NEW ORLEANS, LA, 70116

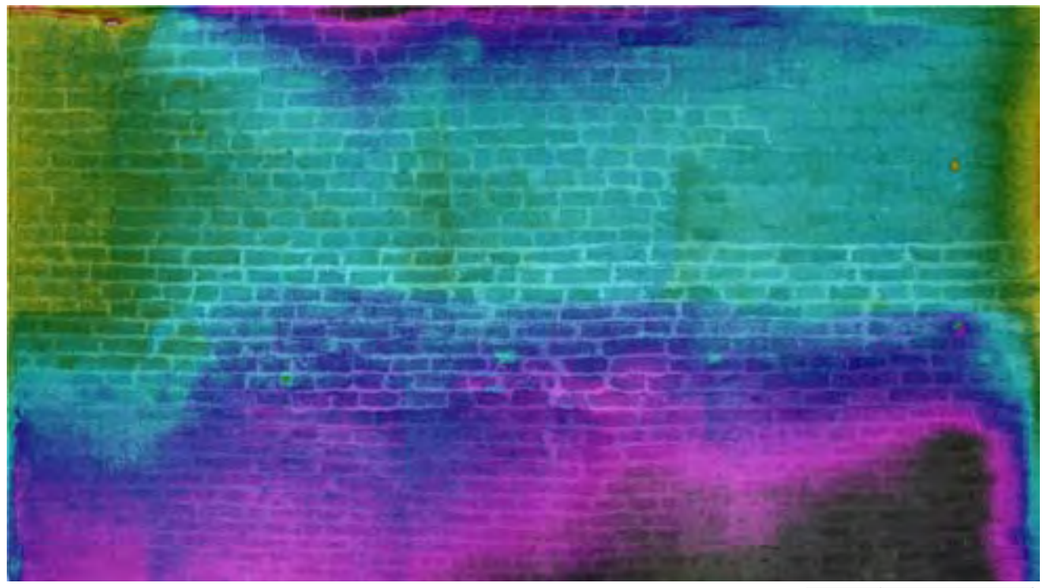
wall #

281-ne4



DIGITAL PHOTOGRAPH

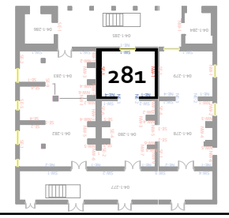
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INFRARED IMAGE OVER PHOTOGRAPH

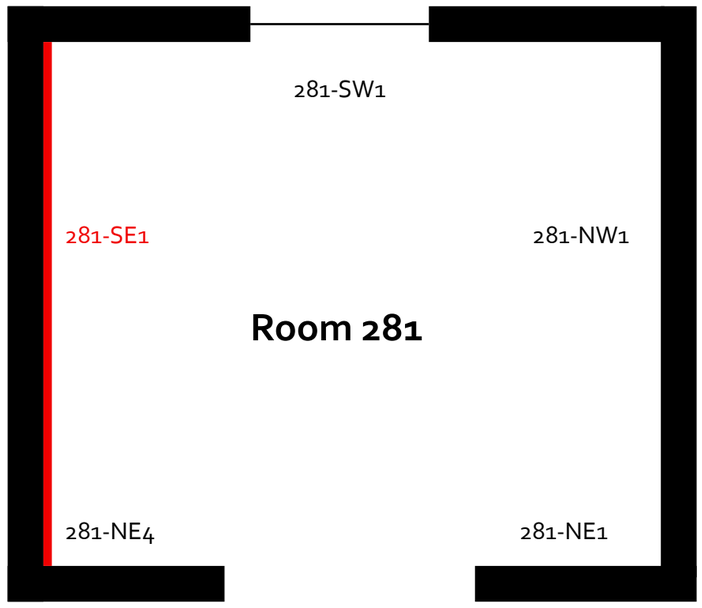
0′ 1′ 2′ 3′





DUMAINE STREET

FIRST FLOOR



N

Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 Dumaine Street, New Orleans, LA, 70116

wall #

281-se1



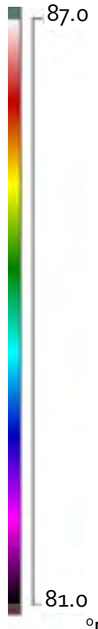
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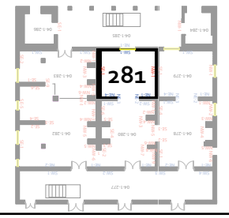
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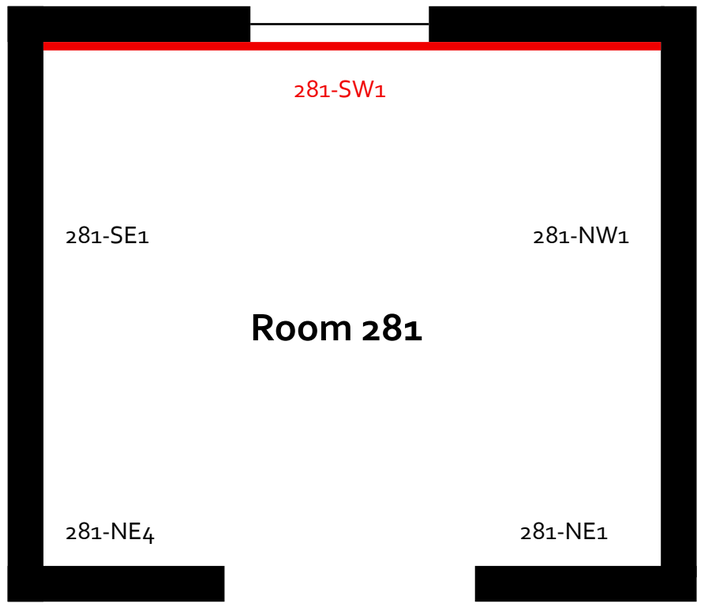
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DUMAINE STREET

FIRST FLOOR



Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 Dumaine Street, New Orleans, LA, 70116

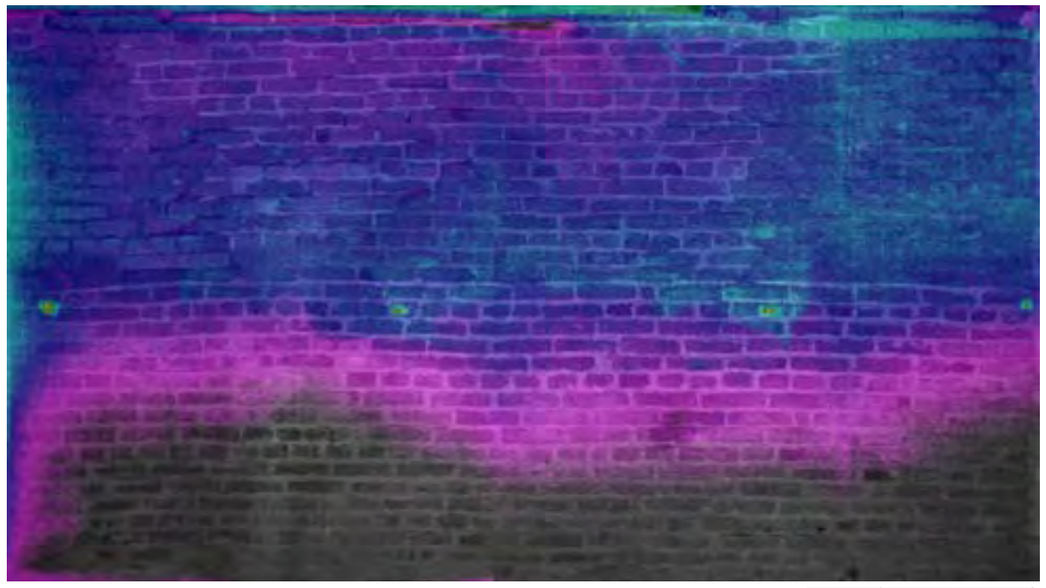
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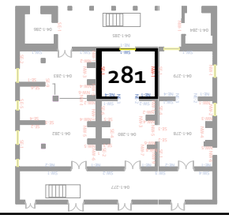
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DUMAINE STREET

FIRST FLOOR



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Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 Dumaine Street, New Orleans, LA, 70116

wall #

281-nw1

DIGITAL PHOTOGRAPH

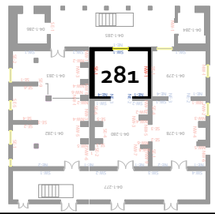


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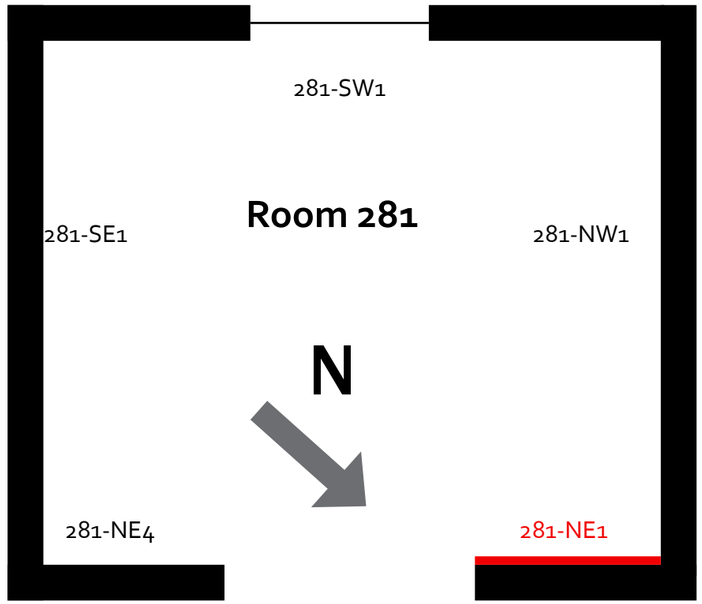


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DUMAINE STREET

FIRST FLOOR



Drawing:	Comparison between rectified wall elevation and merged thermal images
Date:	August 26, 2012
Analysis:	Michael Shoriak Cypress Building Conservation

MADAME JOHN'S LEGACY

632 DUMAINE STREET, NEW ORLEANS, LA, 70116

wall #

281-ne1

Appendix D.

Management Summary: Archaeological Test Excavations at Madame John's Legacy (16OR51), Orleans Parish, Louisiana
August 28, 2013

(D. Ryan Gray, Ph.D. RPA)

UNIVERSITY OF NEW ORLEANS, DEPARTMENT OF ANTHROPOLOGY

MANAGEMENT SUMMARY

ARCHAEOLOGICAL TEST EXCAVATIONS AT MADAME JOHN'S LEGACY (16OR51), ORLEANS PARISH, LOUISIANA

D. RYAN GRAY, PhD, RPA

8/28/2013

This program received federal financial assistance for identification and protection of historic properties. Under Title VI of the Civil Rights Act of 1964 and Section 504 of the Rehabilitation Act of 1973, and the Age Discrimination Act of 1975, as amended, the U.S. Department of the Interior prohibits discrimination on the basis of race, color, national origin, disability, age, sex or sexual orientation in its federally assisted programs. If you believe you have been discriminated against in any program, activity, or facility as described above, or if you desire further information, please write to:
Office of Equal Opportunity; U. S. Department of the Interior; Washington, D. C. 20240

ACKNOWLEDGEMENTS

The author would like to thank a number of volunteers who devoted their time and energy to this archaeological project. University of New Orleans anthropology students Janet Greenfield, Alahna Moore, Michael Montgomery, Aimee Savoy, Elizabeth Seleen, and Elizabeth Williams all devoted multiple days to the project, as did Kathleen Scanlan and Rachel Williams. Many other volunteers helped out as their time and schedules permitted, including Brittany Arceneaux, Rita Czek, Tyson Hall, Alexandra Johnson, Patty Kuntz, Ricah Marquez, Judith Rhoden, and Simon Wooster. All were patient enough to bear with last-minute schedule changes and unexpected conditions under the ground! Thanks also to the many others who volunteered, but whose days were cancelled because of scheduling.

Additional thanks to Mr. Greg Lambousy and the staff of the Louisiana State Museum, who agreed to allow this project and were willing to see it through, despite the obstacles. A special thanks goes out to the facilities and maintenance personnel of the Museum, without whose assistance in jackhammering, drilling, and cement removal in the areas proposed for excavation this project would not have been possible!

Thanks also to the volunteers, guards, and staff at Madame John's Legacy, and to the staff at the Louisiana Museum Foundation, who facilitated access to the site on a daily basis.

MANAGEMENT SUMMARY
ARCHAEOLOGICAL TEST EXCAVATIONS AT MADAME JOHNS LEGACY (16OR51), ORLEANS PARISH, LOUISIANA

D. Ryan Gray, Ph.D., RPA
University of New Orleans
Department of Anthropology

Introduction

During the Summer of 2013, a team from Tulane University and its Masters in Preservation Studies program, under contract with the Louisiana Division of Historic Preservation, undertook a long-term study of conservation issues at the primary structure at Madame John's Legacy, 632 Dumaine Street, in New Orleans' French Quarter. The property is presently owned and maintained by the Louisiana State Museum, and a museum gallery space is operated on the upper level of the building. Portions of the brick walls of this structure have undergone substantial deterioration, and the goal of the conservation effort initiated by this contract is to determine the source of moisture and salts adversely affecting the brickwork on site. A number of techniques are being utilized to this end, including infrared imagery, test cores of the walls, and the installation of sensors to monitor moisture at select locations in the walls.

Among the goals of the conservation effort was the assessment of both subsurface conditions around the brick walls of the primary structure and the conditions of the brick foundations themselves. Per Louisiana's *Archaeological Resources Act* (R.S. 41:1606), a Cultural Resources Investigation Permit from the Louisiana Division of Archaeology is required for any ground-disturbing work performed on site at Madame John's Legacy. Dorothy Krotzer, project manager for the conservation effort, and Dr. John Stubbs (Principal Investigator), contacted Dr. Ryan Gray from the University of New Orleans, Department of Anthropology, about conducting a series of archaeological excavations on site in conjunction with the conservation effort, so that this effort would also expand the body of archaeological data from this important historic site. After consultation regarding the goals of the project, Dr. Gray presented a technical proposal to the Louisiana Antiquities Commission in June of 2013 and was granted a permit to excavate 3 1 x 1 m units within the interior of the primary structure's ground floor. All of these documents will be provided as appendices to the draft report of investigations to be submitted to the Louisiana Division of Archaeology. Archaeological field work at Madame John's Legacy began on 1 August 2013 and concluded on 27 August 2013.

This Management Summary presents the preliminary results of field excavations at three locales within Madame John's Legacy. Units A and B, each measuring 1 x 1 m, were placed alongside two interior walls on the northwest (or grid west) side of the building, with one along the back interior and the other along the front interior of the walls (see Figure 1). A third smaller unit (Unit C) was placed along a wall near the center of the building, primarily to allow for the installation of a subsurface moisture monitor. The present investigations draw upon previous work at the site (Shenkel n.d., Dawdy 1998) and supplement this with data gained from the excavation of these units. Most of the previous work was limited to the exterior courtyards and service building/dependency areas of the city lot on which Madame John's is located (with some exceptions discussed further below). The present units serve a number of goals related to the current preservation efforts at the site. Units were placed alongside interior walls so that they could provide more complete information about the subsurface conditions and soils directly associated with those walls. Special samples were taken of major soil units for possible testing and analysis, in order to determine any special characteristics that may be differentially affecting wall preservation. At the same time, the excavations have helped to confirm the basic stratigraphic sequence in the building interior and the depth and extent of brick foundations.

While the foci of excavations were the foundations themselves, rich deposits associated with the lot's eighteenth-century history were uncovered in the units, with the period of the 1788 fire especially well-represented. In addition, pre-fire deposits were found in both Unit A and B, with these providing a window, however small, into the early colonial period of New Orleans.

The following management summary presents in brief form the results of these field investigations at Madame John's Legacy. This document will be expanded with additional graphics and interpretive data on history, material culture, and chronology along with the results of specialized analyses in a draft report to be provided to the Louisiana Division of Archaeology, Baton Rouge, Louisiana. This project has been financed in part with federal funds from the National Park Service, Department of the Interior, through the Louisiana State Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Historic Preservation. However, the contents and opinions incorporated into this project do not necessarily reflect the views or policies of the Department of the Interior, nor does the mention of trade names or commercial products constitute endorsement or recommendation by the Department of the Interior.

Previous Archaeological Investigations at Madame John's Legacy

In 1971, Madame John's Legacy (16OR51) was one of the first historic period sites in urban New Orleans to be systematically investigated, when the subdiscipline of historical archaeology was still in its relative infancy. These investigations, carried out by Richard Shenkel of the University of New Orleans, were primarily intended "to solve limited objectives particular to the structural detail and chronological development of the house" (Shenkel n.d.:1), particularly pertaining to the relationship of the existing structure and an earlier one, presumably at least partially destroyed in the 1788 fire. At least 9 units of various sizes were excavated to this end, and 3 of them (Units 7, 5, and 9), located alongside existing foundations of the main house, are of particular relevance to the present investigations. Two others were located alongside the brick columns separating the loggia of the house from the rear courtyard and will be given somewhat less attention here. Overall, the units documented highly variable stratigraphy throughout the area, with evidence of multiple resurfacings of courtyards and brick floors, and 2.5 to 3.5 ft[1] of cultural strata accumulated over the sterile clay subsoil matrix.

True north at the site is located roughly diagonally to the city street grid within the Vieux Carre, but, in keeping with the conventions of Dawdy's 1998 work at the site, from the main house towards Dumaine Street is treated as grid north throughout the subsequent discussion. Unit 7 was apparently located so as to span the doorways linking what had been designated Room 1 (the present foyer at the street frontage), and Rooms 2 and 3, the eastern and central front chambers[2]. At its maximum extent, Unit 7 measured 10 ft east/west and 7 ft north/south, though an irregular portion of this area was not excavated. A number of subsurface features were encountered in this unit, including the remains of a wooden drainage system just beneath the brick floor. The soils encountered during excavations were typically characterized as a mixture of fills containing crumbled brick, architectural debris, oyster shell, often mixed with soil characterized as "a very sticky gumbo" (Shenkel n.d.:49).

According to the profile drawings on file with UNO, the foundation of the front wall (separating the Room 1 'foyer' from Rooms 2 and 3) extends to a depth of 2.4' from the existing grade, with 8 subsurface courses of brick laid in a slightly irregular running bond. The footing is

[1] All measurements in the 1971 excavations are listed in English units, and I have not converted them here because of some possible inconsistencies in use of decimal notations in the original.

[2] Note that there is some discrepancy between the reconstructed site map (as depicted in Dawdy 1998:19) and an existing map on file at UNO. As the profile drawings are more consistent with the latter referenced map (which is assumed to have been drawn by Shenkel in 1971), this one is assumed to be more accurate here.

not pyramidal, but instead steps outwards only once at 1.3 ft below ground surface. Also at about 1.3 ft below grade, continuous door sills were located in the entryways between both Rooms 1 and 2 and Rooms 2 and 3. This was interpreted as the ground surface at the time the main structure was rebuilt in 1788, with the intervening 1.3 ft representing leveling and accumulations of debris over the course of the nineteenth and twentieth centuries. This interpretation was further supported by the presence of a carbon-stained layer (presumably representing the fire itself) and soils with earlier eighteenth-century artifacts beneath this level.

Unit 5, measuring 3.5 ft north/south by 5 ft east/west, was described as having been located in the interior northwestern-most corner of the covered portion of the rear loggia. The unit was bounded on two sides by walls and has since been enclosed as a separate room. It contained numerous examples of resurfacings of the covered portion of the brick courtyard, although an occasional paucity of diagnostic artifacts separating them made precise dating difficult. These soils had accumulated to a depth of just over 3 ft. The brick foundations of the main house were very similar to those noted in Unit 7, with the footing expanding only one course, presumably around the level of what had been the 1788 ground surface. The grid west wall of the loggia abutted the main house wall but was not directly joined into it. Its deepest course stepped out once more, and both foundations rested on a bed of oyster shell.

Unit 9 was located in the exterior alleyway on the grid west side of the main house. It was a trench measuring 7 ft north/south by 4 ft east/west. The exterior side of the main house wall foundation was identical in structure to that noted during excavations on the interior, with a single step outwards at just over 1 ft below grade. The gap between the loggia extension and the main house was also noted here, with it being concluded that the loggia wall was later in construction. The most interesting feature of the unit from an archaeological standpoint was a plank located at a depth of 2.3 ft running perpendicular to the main house wall. It was posited that it was the remains of the earlier Colonial period structure on the lot. Unfortunately, the profile and plan drawings associated with Unit 9 have not been located.

Two additional units, designated Units 4 and 6, are of some interest here. These units were located among the central loggia columns at the rear of the main house and were somewhat shallower than the interior units. The pillars or columns of the loggia appeared to originate in one of the later courtyard resurfacings (at a depth of less than 1 ft), and the majority of the material associated with them dates from the nineteenth century.

Further archaeological work was undertaken more recently by Shannon Dawdy under the auspices of the Greater New Orleans Archaeological Program (Dawdy 1998, cf. Dawdy 2008). These investigations were focused entirely upon areas to the exterior of the primary structure and were planned to mitigate impacts to archaeological resources in the rear courtyard associated with installation of a new air conditioning system. This work was planned in part for compliance with Louisiana's *Archaeological Resources Act (R.S. 41:1606)*, which mandates that significant archaeological remains on state-owned property be considered during work that might negatively impact them. While the research plan considered the possibility of shifting some excavations to the interior of the main structure, this course of action was abandoned, as it would have required disturbance of the brick floor beneath it.

Dawdy's excavations, totaling six square meters of horizontal area, documented a complex stratigraphic sequence, with numerous artifact-rich midden deposits, features (mainly related to resurfacings of the patio/courtyard area), and a trash pit seemingly related to the 1788 fire that damaged the Colonial period structure on the lot. While the results of the excavations are not directly pertinent to the goals of the present research (other than to emphasize the variability in strata at the site), the research issues defined in the work are very significant. From a methodological standpoint, Dawdy's work indicated that the use of a 5 cm vertical level, at least within intact early (Colonial-era) deposits, had the potential to yield more refined

chronological information than the more traditional 10 cm level. More importantly, it provided important data on consumption and the use of space in the Colonial period, which could be used in conjunction with a detailed reading of historical documents to examine the formation of a 'Creole' identity in the eighteenth century.

Field Investigations

As noted above, three units were opened during the present investigations. These units were designated Units A, B, and C in order to differentiate them from Shenkel's and Dawdy's previous work at the site. All three had originally been planned as 1 x 1 m units, but the third was eventually scaled back in size, as detailed in the discussion of Unit C below. All unit elevations were measured in reference to a datum string placed at 10 cm above ground surface. However, the 1990s renovation that resulted in the present floor surface has provided an unusually level starting point for excavations. As a result, measurements in all units are immediately comparable, as the variation in floor elevation within the structure is minimal. All directional notations are based upon a grid north following the existing street grid, with the Dumaine Street frontage representing grid north.

All hand excavation units were excavated according to natural strata, with each stratum sub-divided into levels not exceeding 5 cm in thickness, in keeping with the methodology defined by Dawdy previously. All units were excavated to sterile subsoil, with the exception of Unit C (described below). At the bottom of each level, units were planned and photographed. In each unit, a 5 L soil sample will be taken from undisturbed natural strata for flotation. A portion of this sample was collected for possible chemical analyses, in keeping with the goals of the Tulane Preservation Studies project. All other excavated soil was screened through ¼ in (0.64 cm) wire mesh. Brick, oyster shell, and construction materials recovered during screening were weighed and discarded in the field after a representative sample had been removed. All other cultural materials were bagged and processed as described below. Upon completion of each unit, at least two contiguous profiles were drawn, and all profiles were photo-documented in order to illustrate site stratigraphy. The Harris Matrix system was used to document and record all excavated stratigraphic and feature contexts. All features uncovered in hand excavation units were planned and photographed, and feature fill was excavated separately.

It should be noted that, when working in interior spaces like this, the lack of natural lighting is a distinct problem in excavation. In this case, although electric lights are installed in the downstairs interior, they often caused problematic shadowing and were insufficient for photography. Attempts were made to rectify this by using flash photography and/or additional utility lamps with varying degrees of success.

Unit A Excavations. Unit A was a 1 x 1 m unit located along the interior of the rear wall of the grid southwest corner chamber of the ground floor area. The unit was located approximately 1 m from the west wall of Madame John's Legacy and was oriented on the same axis as the building, using the south wall of the building as the southern boundary of the unit. This unit was positioned in this area for a variety of reasons. In a previous renovation, plumbing or duct work had been installed to serve restrooms located beneath the upper floor *cabinets* just on the other side of this wall. The unit would serve to assess differential effects on the foundation that might be due to this infrastructure, in keeping with the overall goals of the larger conservation project. In terms of archaeological goals, historical and cartographic research had suggested that the earlier construction on this portion of the block would more likely be located towards the west side of the block. Furthermore, in the excavations by Shenkel on the building's exterior (to the southwest of Unit A), wooden timbers apparently dating to the French Colonial period had been located in this vicinity. Finally, it was generally suspected that there would be a greater likelihood of encountering artifact-rich deposits further back from the Dumaine street frontage.

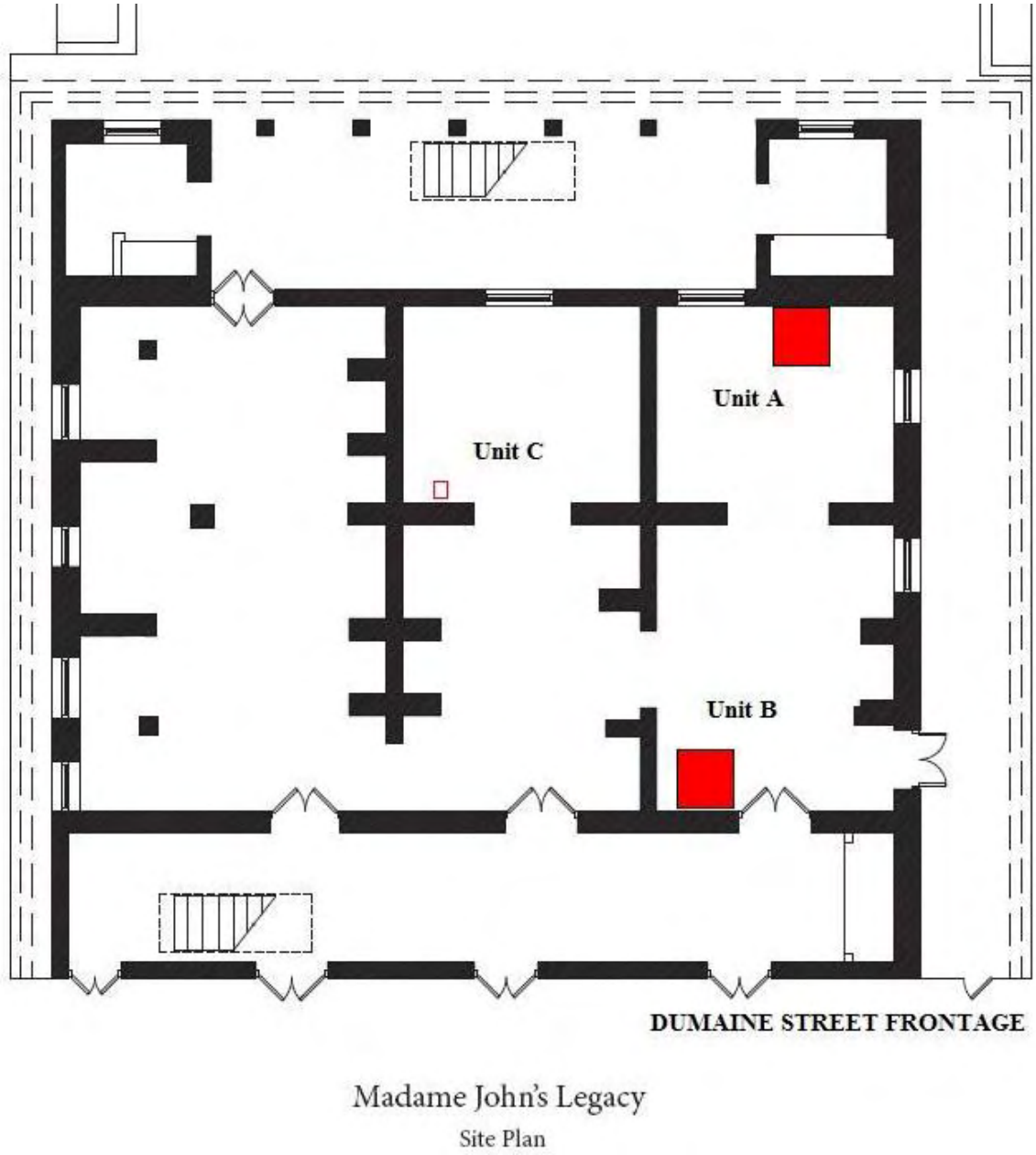


Figure 1. Site plan of Madame John's Legacy showing locations of present investigations in interior of building. Full units are filled in red, and partial unit is outlined in red. Grid north referenced in all excavation discussions is towards Dumaine Street frontage. Approximate scale: 1 cm=4 m. Base map provided by Tulane University, Masters in Preservation Studies program.

Unit excavation was initially hindered by the herringbone-patterned brick floor in the interior of the building (Figure 2). This brick floor had been constructed as part of a series of renovations in the 1990s. The initial plan was to remove the brick in an area about 120 cm square, labeling each brick using chalk as it was removed so that it could be replaced precisely in the original pattern. This proved to be difficult in itself, as the brick had been laid into a wet cement bed, and varying amounts of cement had overlapped the bottom edges and filled in the spaces between brick. A geological pick, chisel, and hammer had to be used to create space and break the seal of each brick with the cement bed beneath it. After the brick was removed, the cement bed beneath the floor proved to be quite substantial, and hand tools were inadequate to break through the surface. In consultation with the Tulane Preservation Studies team and Louisiana State Museum (LSM) personnel, it was determined to use a jackhammer operated by LSM employees to penetrate the slab, while additional museum staff monitored vibrations in the upper level of the building. The jackhammer was effective in initially breaking up the slab, with the remainder of the debris from the slab being broken up with hammers and picks to outline the unit. However, because of concerns about the impacts of vibration, it was elected to use an alternative technique to break through the slab in the other units (as described below).

The cement slab was somewhat thicker alongside the wall and thinned towards the center of the room, varying from 5 to 10 cm (1.97 to 3.94 in) in overall thickness. It had been poured onto a wire mesh frame at a depth of 25 cmbd (or 9.84 inbd, see Figure 3). This, in turn, overlay a layer of thin plastic sheeting forming a moisture barrier, which extended all the way to the edge of the south building wall at a depth of 29 cmbd (11.42 inbd). The intervening spaces had been filled with a layer of loose, powdery mortar. Beneath the plastic, a layer of fine pale yellow (2.5Y 8/3) sand fill from 10 to 15 cm (3.94 to 5.91 in) in thickness was used to form a level surface for the moisture barrier, cement slab, and brickwork. These layers were designated Contexts 1-6 (see Table 1). All had been installed as part of a single effort to level and improve the interior floor. As will be discussed in the Conclusions below, rather than these layers being used to raise the floor level, they had replaced nearly 30 cm (11.81 in) of historic strata (including nineteenth-century floors and midden deposits) previously documented by Shenkel. Because of the patterning of the brick and the effort required to get through these levels, the final location of the unit was at 0.9 m (2.95 ft) from the west wall of the structure, so that it spanned the 0.9 m to 1.9 m (2.95 to 6.23 ft) area of the interior from west to east. A unit datum was established along the wall at the southeast corner of the unit at 10 cm (3.94 in) above existing ground surface (i.e. the contemporary brick floor).

The first historic stratum encountered was designated Context 7. It occurred beneath the Context 6 sand fill and formed an irregular surface anywhere from 32 to 42 cmbd (12.60 to 16.54 inbd). Context 7 is a dark grayish brown (2.5Y 4/2) silty clay fill mottled with occasional olive brown (2.5Y 4/3) loamy patches. These loamy patches increased by depth. Context 7 was excavated in 4 5 cm levels, with the first two levels used to bring the unit down to a uniform depth of 42 cmbd (16.54 inb), and the remaining two exposing the next excavation context. When Context 7 was initially exposed, a series of small rectangular depressions were noted in the northeast quadrant of the unit, most about 5 cm (1.97 in) long and 3 cm (1.18 in) wide. These represented points at which the jackhammer had penetrated too deeply and made impressions into the new soil; however, in no place had the jackhammer penetrated through the context. Context 7 was sparse in cultural material, with occasional artifacts suggesting an early to mid-nineteenth century date for the fill episode represented by it. Artifacts collected included small fragments of ceramic, including brown transfer-printed pearlware, olive glass, animal bone, nails, a shell button, and small quantities of brick rubble, mortar, and slate. At 47 cmbd (18.5 inbd), an increase in brick rubble was noted, and an alignment of larger brick fragments running north/south near the center of the unit was mapped in place. In addition, the brick wall of Madame John's (referred to as Context 16) stepped out slightly at 47 cmbd (18.5 inbd), forming an approximately 3 cm (1.18 in) lip within the unit.

Context Number	Provenience	Description	Depth	Association
1	Entire Ground Floor Interior	Herringbone Pattern Brick Floor	10-15 cmbd	1990s Renovation
2	Entire Ground Floor Interior	Hard Cement Bed for Brick Floor	15-25 cmbd	1990s Renovation
3	All Units	Soft Powdery Mortar/Cement	20-25 cmbd	1990s Renovation
4	All Units	Thin Wire Mesh Bedding for Cement	24 cmbd	1990s Renovation
5	All Units	Plastic Sheeting Moisture Barrier	26 cmbd	1990s Renovation
6	All Units	Clean Sand Fill	26-37 cmbd	1990s Renovation
7	Unit A	Silty Clay Fill	35-50 cmbd	ca. 1820-1850
8	Unit A	Olive-Toned Silty Loam Midden	50-52 cmbd	ca. 1800-1820
9	Unit A	Artifact Concentration Associated with Top of Context 10	52 cmbd	ca. 1800-1820
10	Unit A	Compact Crumbled Brick, Mortar, and Shell (Floor Surface)	49-53 cmbd	ca. 1788-1789 interior resurfacing
12	Unit A	Burned Debris Concentration (Possible Pit)	49-60 cmbd	1788 fire debris
13	Unit A	Heat-Altered Debris in Silt Loam Matrix	55-60 cmbd	1788 fire debris
16	Unit A	Subsurface Foundation of MJL Primary Structure Rear Wall	N/A	ca. 1730 original striucture
17	Unit A	Dense Burned Debris	60-66 cmbd	post 1788 fire debris
18	Unit A	Ash Lens	66-68 cmbd	1788 fire
20	Unit A	Silty Clay to Loamy Clay Midden	68-75 cmbd	ca. 1720-1760
23	Unit A	Crushed/Crumbled Brick Surface	75-80 cmbd	1725 construction on lot?
24	Unit A	Wooden Plank Extending Under Ctx 16	80-85 cmbd	1725 construction on lot?
27	Unit A	Clay/Silty Clay Subsoil	80-90 cmbd	N/A

Table 1. Contexts identified in Unit A.



Figure 2. Herringbone patterned brick floor in Unit A area, facing west.



Figure 3. Framework for cement slab (Contexts 3, 4, and 5), facing west.



Figure 4. Context 10 in Unit A, a compact mortar and crushed brick surface, facing west. Context 12 is the darker area in the upper left (southwest) corner of the unit.

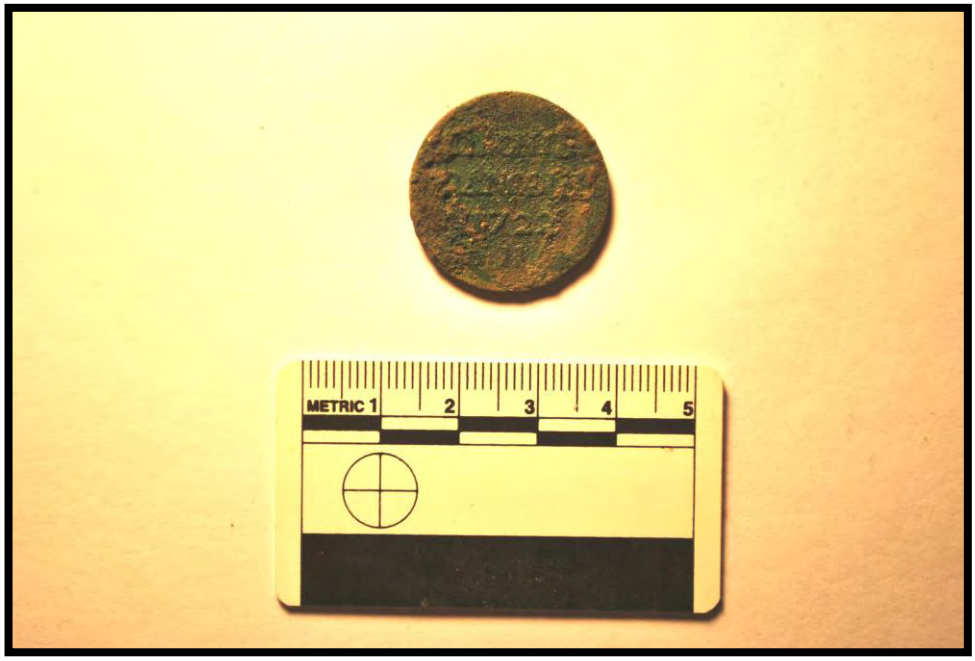


Figure 5. 1722 "COLONIES FRANCAISE" 9 denier coin, with mint mark from La Rochelle, France.

At 52 cmbd (20.47 inbd), the soil became distinctly more silty in texture, with an increase in organic content and in artifacts, and with a clear separation visible from the clayey Context 7 matrix. Designated Context 9, the remnant olive brown (2.5Y 4/3) silty loam midden with some charcoal staining corresponded closely to the top of a new course of brick in the south wall. Artifacts were most concentrated to the north of the brick alignment noted in the previous level, which now seemed to form a slight L-shape to the west. This brick alignment was designated Context 8, but it was found to only consist of a single course of bricks with no evidence of any joining of those bricks with mortar. Based on the artifacts in Context 9, including creamware and pearlware, Context 9 likely represents the ground surface within Madame John's at the beginning of the nineteenth century. In this regard, the Context 8 bricks appear to be incidental, simply representing an accumulation of debris rather than a structural feature. Some possible wood staining was noted to the east of the brick alignment, apparently the remnant of a later decomposed stake originating in the Context 7 layer.

Context 9 was found to consist of only a thin (typically no more than 2 cm or 0.79 in thick) accumulation of organic debris on top of a compact surface of crushed brick, mortar, and burned rangia shell. This surface, presumably representing a prepared floor dating to the 1788-1789 rebuilding of Madame John's, was called Context 10 (Figure 4). It was found throughout the unit at a depth of 53 cmbd (20.87 inbd), with the exception of a small irregular area in the southwest quadrant of the unit and along its south wall (i.e. along the Context 16 brick wall foundation). This area contained larger quantities of loose burned ceramics, particularly fragments of Spanish olive jars, and brick rubble, and was designated Context 12, a possible pit. Context 12 was subsequently removed in 2 5 cm levels. However, the boundaries of Context 12 were never very clear, and the artifacts associated with it do not appear to be qualitatively different than those from Context 13. These contexts are discussed together below.

Context 10 itself is no more than 4 cm (1.57 in) in thickness. It consists predominantly of burned shell, mortar, and brick fragments, in a compact very dark grayish brown (10YR 3/2) sandy loam matrix. Artifact content increased considerably at this level, with large quantities of fragments of eighteenth century ceramic types originating in this level, including burned creamware and tin-enameled ware, Spanish olive jars, and Rhenish stoneware. The most unique artifact find in this layer was a copper coin. Although one side was too badly corroded to be read, the obverse was embossed with the words "COLONIES FRANCAISES" and the date "1722" over a small mint mark indicating that it was minted in La Rochelle, France (Figure 5). This coin has been described as the "first 'American' copper" coin; it was minted specifically for circulation in the French colonies and was sent to Canada. Apparently, it was unpopular and never extensively used there, but it took on a new life in French Louisiana, where hard currency was often in short supply (Kraljevich 2012). Its occurrence in a context dating from just after 1788 demonstrates just how long these coins remained in circulation[3]. Also noteworthy was a fragment of a cuprous parasol or umbrella arm.

After the removal of the Context 10 surface, significant quantities of loosely consolidated burned material and brick rubble were noted throughout the new level. This material extends from 53 to 63 cmbd (20.87 to 24.8 inbd). As noted above, two separate context designations were assigned for this area: Context 12 refers to an area in the southwest corner of the unit and extending into the west wall in which there was very little actual soil whatsoever in the matrix. The level was predominantly comprised of fragments of olive jar and brick with charcoal and mortar flecks, in a loose dark olive brown (2.5Y 3/3) silty loam matrix. This loose, artifact-rich zone was surrounded by a somewhat more compact dark grayish brown (2.5Y 4/2) silty loam with occasional moist clayey areas. Its artifact content was very similar to that of Context 12,

[3] A more extensive discussion of the archaeological distribution and significance of the 9-denier "COLONIES FRANCAISES" coin will be provided in the draft report of investigations.

with olive jar and Rhenish stoneware fragments, burned creamware and faience, heat-altered glass, hand-wrought nails, and infrequent bone fragments. Other notable artifacts included a brass lock escutcheon and a bone button. A high concentration of burned shell and mortar, along with some fragmentary brick, also comprised the layer. It is possible that the Context 12 area actually represents the original location of a complete olive jar, stored on the pre-1788 ground floor of the building on the lot. When it burned, it would have collapsed and shattered, and the numerous olive jar fragments surrounding this loosely grouped core would represent that shattering.

At 63 cmbd (24.8 inbd), an increase in size of brick rubble was noted throughout the level, although the basic soil matrix remained virtually identical to that of Context 13 (i.e. a dark grayish brown silt loam). Context 17 was assigned to reference the full level containing this lens of large rick rubble and continuing burned ceramic vessel fragments (Figure 6). Immediately beneath this lens of brick and cultural debris was a well-defined lens of ash and charcoal extending throughout the unit at a depth of approximately 67 cmbd (26.38 inbd). All of the brick from Context 17 clearly rested on top of this organic lens (or Context 18), with no additional courses extending beneath it. Context 17 (and the second level of Context 13 above it), while appearing dry during excavation, became considerably more mucky when exposed and aerated during the screening process. This necessitated many small fragments from the levels being collected in bulk for later water screening. Context 18 is a black (10YR 2/1) loam (Figure 7). The Context 18 deposit was removed as a single sample for flotation, as it consisted of a thin lens of no more than 2-3 cm (0.79-1.18 in) of ash and debris. It occurs at the level of the lowest course of brick from the Context 16 wall.

Context 20 represented a Colonial-era ground surface and midden accumulation extending beneath the extant wall of Madame John's Legacy. Just beneath Context 18, at 68 cmbd (26.77 inbd), Context 20 was described as a very dark grayish brown (2.5Y 3/2) clay loam with large quantities of crushed rangia shell and mortar, plus occasional brick fragments and large oyster fragments. Also noted were pockets of sandier soil throughout, along with a variety of cultural material, particularly tin-enameled wares, small bits of bone, much of it fish and bird, thin shards of olive glass and colorless glass tableware, straight pins, and at least one fragment of aboriginal pottery, an undecorated shell-tempered sherd comparable to the Mississippi Period *Bell plain* type. Context 20 was excavated in 3 levels of 5 cm each, with the last level representing a rapid transition to subsoil. The soil gradually shifted to a more markedly very dark gray (10YR 3/1) silty clay in color and texture, though occasional pockets of the more midden-like olive-toned soil (varying from 2.5Y 4/4 to 3/3 in color) continued to 85 cmbd (33.46 inbd). The artifacts in each of the two additional levels of Context 20 were comparable to those in the first, with a pipe stem fragment, a polished turtle shell disk, and a bone spur from a rooster also noted. A scatter of apparent turkey bones was also noted in the central portion of the unit at about 73-75 cmbd (28.74-29.53 inbd). These were located alongside a concentration of mortar and oyster shell at the north edge of the unit, but none of the bones appeared to be articulated.

At 78 cmbd (30.71 inbd), a number of possible features were noted, although, given the small area exposed, it is difficult to say with certainty what these features represent. Already at 73 cmbd (28.74 inbd), a number of circular and semi-circular hollow areas had been noted, most concentrated in an area in the northwest quadrant of the unit. Although such hollows in deeply buried clayey soils are not uncommon in New Orleans, where they are typically due to bioturbation (e.g. decomposed roots, rodent and crawfish burrows, and so on), they can also represent the locations of historic posts. Further suggesting this was that, by 78 cmbd (30.71 inbd), these hollow areas seemed to follow the edge of a brick concentration covering most of the eastern half of the unit. In addition, at 76.5 cmbd (30.12 inbd), a decomposed wooden plank was noted extending to the south, beneath the present brick foundation. This wooden feature angled downwards slightly from east to west and was 25 cm (9.84 in) wide, but only about 4 cm

(1.57 in) in thickness. Another rubble concentration occurred paralleling the western wall of the unit. The plank was labeled as Context 24 but was otherwise left in situ.



Figure 6. Context 17, the debris layer from 1788 fire, facing west.



Figure 7. Context 18, ash and charcoal layer from 1788 fire, facing west.

This arrangement of features seemed consistent with the construction of a French Colonial post-in-ground or post-on-sill structure (Figure 8). It was hoped that the excavation of the area between 78 and 83 cmbd (28.74 and 32.68 inbd) would help to clarify the nature of this grouping. Context 20, Level 3, was limited to the trench-like area between the two concentrations of brick rubble noted above, but the soil in this area rapidly made a transition to the dark gray (10YR 4/1) silty clay matrix that is more characteristic of subsoils in New Orleans. Some larger bone fragments were noted in this area, but there were no structural remains indicative of posts and/or a construction trench. While some brick and bousillage was noted, it did not occur in a concentration that would indicate the presence of a structure. In addition, none of the possible posts maintained the consistent shape or orientation that would be suspected in they were cultural in origin.

The concentration of brick at this level was given a new context number (Context 23) and was excavated separately. It was associated with few artifacts, and it appeared to rest directly in the dark gray silty clay representing the transition to subsoil. After the removal of the brick, an additional level of clay subsoil was removed in selected areas of the unit, and a soil probe was used to examine stratigraphy at deeper levels. No further cultural deposits were identified, with the exception of occasional brick flecks, likely representing material trampled into subsoil and pushed deeper into the moist, unstable soil by natural processes. The subsoil, defined as Context 27, is a dark gray (10YR 4/1) clay/silty clay matrix with extensive reddish brown (5YR 5/4) oxidation staining.



Figure 8. Brick surface (Context 23) and wooden plank (Context 24) near base of Colonial-era level, facing west.

Unit B Excavations. The area selected for the excavation of Unit B was approximately 3 m (9.84 ft) from the west wall of the primary Madame John's structure, immediately adjacent to the interior of the front (Dumaine Street) wall. It was located on the east side of the street-facing opening that allows access to the northwest interior room, and it ended about 20 cm (7.87 in) short of the interior north/south wall that bounds this room. Shenkel's excavations had focused on the interior to the east of this point, and it was hoped that this unit's placement would allow for comparison with his previous investigations. This was also near one of the areas in which brick was deteriorating badly on this front interior wall, and it was anticipated that the unit might provide information regarding soil conditions and moisture towards the street frontage of the building. All identified contexts in Unit B are listed in Table 2.

Contexts 1-6 in Unit B were identical to the ones defined for Unit A, with some minor variation in thickness of the slab, mortar, and sand layers. The herringbone brick floor was fixed into the underlying cement slab much more securely in this area, and it was only with considerable difficulty that the brick could be removed. Because of concerns with vibrations from the jackhammer used to penetrate the slab in the Unit A area, a different technique was used to remove it at Unit B. A large Hilti drill (the TE MD 20 electropneumatic rotary hammer) with a 3" bit, provided and operated by Louisiana State Museum staff, was utilized to drill a regular series of holes in the slab (Figure 9). These holes were used to create a 'swiss-cheese' effect, so that eventually hammers and chisels could be used to break away segments of the Context 2 cement slab. In this case, the slab was much more firmly embedded in the underlying wire mesh, much of which was removed with the slab. The remainder of the construction material was cleaned by hand, and tin snips were used to trim back additional metal from the wire frame. The sand fill (Context 6) was again removed as a single level, and the start depth for historic strata in the unit was an uneven surface ranging from 32 to 37 cmbd (12.60 to 14.57 inbd). It thus showed less variation than that in Unit A. It also appeared to have been somewhat less impacted by the massive renovation/fill removal/leveling episode marked by Contexts 1-6, in that, in shallower portions of the unit (those at 32-35 cmbd or 12.6-13.78 inbd), a lens of very dark grayish brown (10YR 3/2) charcoal flecked sandy loam was present. Designated Context 14 and predominantly located in the southeast portion of the unit, it represents a remnant of one of the later-nineteenth-century midden deposits. It rests directly on Context 15, a dark grayish brown (2.5Y 4/2) silty clay loam, that most likely represents the same early-mid-nineteenth-century fill episode as Context 7 in Unit A. A wooden stake associated with the modern leveling episode extended into Context 14 and 15.

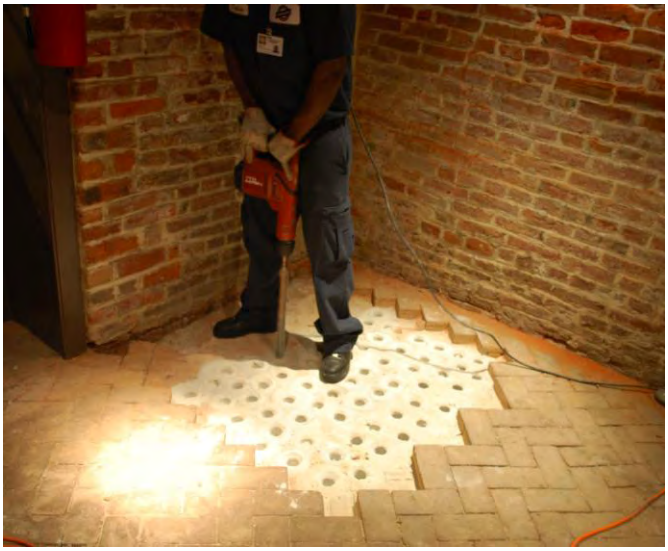


Figure 9. Drilling of cement slab in Unit B area, facing northeast.

Context Number	Provenience	Description	Depth	Association
1	Entire Ground Floor Interior	Herringbone Pattern Brick Floor	10-15 cmbd	1990s Renovation
2	Entire Ground Floor Interior	Hard Cement Bed for Brick Floor	15-26 cmbd	1990s Renovation
3	All Units	Soft Powdery Mortar/Cement	20-26 cmbd	1990s Renovation
4	All Units	Thin Wire Mesh Bedding for Cement	25 cmbd	1990s Renovation
5	All Units	Plastic Sheeting Moisture Barrier	26 cmbd	1990s Renovation
6	All Units	Clean Sand Fill	26-38 cmbd	1990s Renovation
14	Unit B	Remnants of Late 19th Century Midden	35-38 cmbd	ca. 1850-1870
15	Unit B	Silty Clay Fill	37-50 cmbd	ca. 1820-1850
19	Unit B	Silty Loam Trench Fill	48-68 cmbd	ca. 1790-1820
21	Unit B	Brick Rubble Layer	50-66 cmbd	post 1788 fire cleaning
22	Unit B	Burned Layer	55-70 cmbd	1788 fire debris
25	Unit B	Concentration of Mortar in Context 21	55 cmbd	1788 fire debris
26	Unit B	French Colonial Ground Surface/Midden	60-75 cmbd	1720s-1760
28	Unit B	Brick Alignment in Context 26 (Possible Lined Post)	55-65 cmbd	1720s-1760
29	Unit B	Transition to Pre-1730s Ground Surface	70-72 cmbd	1720s-1760
30	Unit B	Decomposed Wood (Plank Wall)	75-83 cmbd	1718-1729
31	Unit B	Possible Wall Trench/Fill	75-83 cmbd	1718-1729
32	Unit B	Heavily Mottled Early Colonial Surface	75-90 cmbd	1718-1729
33	Unit B	Madame John's Legacy Primary Structure, Subsurface Portion of Front Interior Wall	N/A	1788 rebuilding
34	Unit B	Silty Clay Subsoil	75-85 cmbd	N/A
35	Unit B	Gleyed Moist Clay Subsoil	90-95 cmbd	N/A
36	Unit B	Concentration of Artifacts, Top of Context 19	48-50 cmbd	1795-1820

Table 2. Contexts Identified in Unit B.

Context 15 was excavated in 3 levels, although the second two levels were combined as a single effort. The context began at anywhere from 32 to 37 cmbd (12.60 to 14.57 inbd), and it ended at 47 cmbd (18.5 inbd). It became increasingly clayey as it approached its maximum depth. At this point, a dramatic change was noted, with a dense lens of early-nineteenth century ceramics, predominantly decorated pearlware tableware, marking the transition to Contexts 19 and 21 (Figure 10). This lens of artifacts was collected as a single unit within Context 19 and corresponds closely with the first step outwards of the brick wall foundation for the extant Madame John's front wall (hereafter referred to as Context 33). The step out of this wall is somewhat different than that noted for the rear wall, extending out more prominently and regularly, to about 6 cm from the wall edge of the upper courses. The soil matrix of Context 19 itself is a loosely consolidated very dark grayish brown (10YR 3/2) silt loam with some loose brick rubble. Though Context 19 was removed in two levels, the extent of the brick in and adjacent to it caused the levels to extend deeper than initially planned, with a visibly burned matrix appearing just beneath it. The ground surface thus exposed varied from 55 to 60 cm (21.65 to 23.62 in) in depth. It was initially assumed that Context 19 represented demolition of earlier structures following the 1788 fire. However, upon further investigation during profiling, Context 19 was found to correspond with fill associated with the construction of the front wall foundation for the standing Madame John's building. Because it had filled in and covered the loose brick debris from the fire (and probably been deposited very soon afterwards, the division between it and the Context 21 debris layer was not immediately evident. As collected in the field, cultural material from the two contexts is likely somewhat mixed, and the majority of brick recovered in Context 19 actually originated in Context 21. Context 21 itself was a deposit of very dark grayish brown (10YR 3/2) sandy loam, marked by significantly more evidence of burning, with burned shell, mortar, and large brick fragments prevalent. Some melted glass and heat-altered ceramics were also noted. Context 21 was excavated in two levels, to a depth of about 65 cmbd (25.59 inbd). The final level of Context 21 likely contains some material from Context 22, as the looseness of the fill made it difficult to separate the soils, especially in the southeast corner of the unit, where large amounts of burned mortar probably represented a destroyed earlier floor surface. This was designated Context 25.

When Context 21 was removed, a uniform deposit of charcoal and ash stained soils was noted throughout the unit. This lens, a black (10YR 2/1) sandy loam, rich in burned shell and mortar was removed as a single deposit representing the 1788 fire event. It was typically no more than 2 cm (0.79 in) thick and was collected as a flotation sample. Beneath the ash and charcoal, at 67 cmbd (26.38 inbd), was Context 26, presumably representing the Colonial period ground surface. Context 26 is a very dark grayish brown (2.5Y 3/2) silty loam with increasing clay content and large quantities of mortar, especially in the southeast quadrant of the unit. Artifacts collected appear to be consistent with the French Colonial period, including faience, Saintonge-glazed wares, and lead-glazed redware. In addition, multiple fragments of a distinctive hand-formed red-slipped or filmed ware, assumed to be of Native American manufacture, were found in Context 26 (Figure 11). These were concentrated along the north wall, very near the base of the Context 33 foundation (which was also identified in Context 26). These wares have previously been reported predominantly within earlier Colonial contexts (i.e. 1700-1750) and may be exclusively associated with French-Native contact.

At the top of Context 26, a concentration of brick, including two brick aligned in an 'L' shape, was noted in the southwest quadrant of the unit. By the second level of Context 26, at about 70 cmbd (27.56 inbd), it was noted that soils seemed somewhat more dry and consolidated in this vicinity. As a result, the area of the unit was assigned Context 28 and was collected as a single sample. Context 28 was characterized by lighter soils, varying to gray (10YR 5/1) in color. However, no further characteristics suggesting that this feature were structural in origin

were noted during excavation. It rested on the same soils that characterized the remainder of the unit below Context 26, the Context 29 transition to subsoil at 72 cmbd.



Figure 10. Concentration of pearlware at top of Context 19/21, facing east. Note additional brick footing course at left.



Figure 11. Red-filmed Native American pottery recovered from French Colonial deposits (top row); Rouen polychrome faience plate rim (bottom), both from Context 26.



Figure 12. Contexts 30 and 31, possible plank wall and associated trench in Unit B, facing east.



Figure 13. East wall profile of Unit B. Note break in stratigraphy along wall at left.

Context 29 is a dark gray (10YR 4/1) silty clay with occasional brick fragments, oyster shell, and other artifacts. However, during excavation of Context 29, a dark, organic stain very dark brown (10YR 2/2) in color was noted extending across the unit from southwest to northeast. Small quantities of a slightly siltier fill with mortar flecks appeared to be associated with it. The organic stain was most pronounced at the west edge of the unit. This narrowed from 4 cm to 1 cm (1.57 to 0.39 in) in width from west to east, while the possible associated fill surrounding it was wider at the east, forming a band about 6 cm (2.36 in) wide at its greatest extent. The organic stain was designated Context 30, and the surrounding fill was designated Context 31 for the purposes of excavation (Figure 12). They were first noted at a depth of 75 cmbd (or 29.53 inbd, just beneath the Context 26 French Colonial deposits) and extended as deep as 85 cmbd (33.46 inbd). The entirety of the Context 31 fill was removed as a flotation sample.

During excavation of the Context 31 fill, it was noted that the soil in the north section of the unit, to the north of the Context 30/31 feature, was considerably more mottled than that to the south, which seemed to be consistent with the typical subsoil at the site. The area to the north consisted of a heavily mottled mixture of silty clay and moist clay, a dark gray (10YR 4/1) streaked with olive brown (2.5Y 4/3) and dark reddish brown oxidation (5YR 3/4) to a degree not consistent with subsoils in the area. Also noted were charcoal stains, bits of brick, and bits of burned shell, sometimes occurring in sandier pockets within the surrounding soil matrix. Such pockets, along with occasional larger fragments of cultural material, occurred to a depth of 92 cmbd, an additional 15 cm (5.91 in) into what had initially been identified as subsoil. Few of the artifacts were diagnostic, but a Saintonge-type green glazed sherd, a hand wrought nail, and some fragments of animal bone were recovered. It is possible that, if Context 30/31 does represent a wall, these pockets may represent early use of the lot, when the unstable, muddy ground surface allowed cultural material to be pressed down and mixed with clay subsoils. This area was designated Context 32 for the purpose of excavation. Beneath these pockets, at 95 cmbd (37.40 inbd), the soil became more consistent in clay content and gleyed (Gley 1 5/1 to 4/1), suggesting that the unit was nearing the water table (Figure 13).

Unit C Excavations. Initially, Unit C was planned as an additional 1 x 1 m excavation on the eastern side of the building, to be located away from the walls so that a sample of material not impacted by later construction could be collected. However, between the time in which excavations were planned and in which excavations were undertaken, the room in which this unit was to be located was utilized by Louisiana State Museum Foundation personnel for temporary storage. After the extent of the slab underlying the brick floor was uncovered in Units A and B, it was elected to change the focus of Unit C. The Tulane conservation team had planned to install a subsurface moisture monitoring device within the interior of the building, so emphasis for Unit C was shifted to opening a small area for this purpose. As the monitor only needed the top of the historic ground surface exposed, excavation was limited to just that sufficient to insert the monitor along a central interior wall.

For the purpose of the Unit C excavation, brickwork was removed and the cement slab exposed in an approximately 30 cm (11.81 in) square area immediately adjacent to a wall segment in which probes had already been placed by the Tulane team. No unit datum was established in this area, so all measurements refer to ground surface at the top of the brick surface (Context 1, from 0-5 cmbgs or 1.97 inbgs). The slab in this area was demolished using the same technique as had been used for the Unit B area (i.e. perforation using a large electropneumatic drill). The cement/metal lining/plastic sheeting barrier combination (Contexts 2-5) was somewhat thinner in this area, extending to only 13 cmbgs, although the brickwork itself was, again, laid very securely into it. The Context 6 sand layer also proved to be somewhat less substantial in this room, as it ended at 25 cmbgs (9.84 inbgs). This had a direct impact on the soils beneath, as a much more substantial apparent late nineteenth century midden and destroyed mortared floor surface was encountered beneath it (Figure 14). Designated Context

11, it consisted of a very dark grayish brown (10YR 3/2) sandy loam with large quantities of fragmented mortar. Large numbers of small mammal bone fragments were also noted in this fill. It was excavated to 44 cmbgs (17.32 inbgs). By this point, the soil had become much more clayey and appeared similar in content to Context 7 in Unit A and/or Context 15 in Unit B. It is assumed that Context 11 represents one of the later strata stripped away during the renovation in which Contexts 1-6 were placed. The excavation of Unit C was terminated at 44 cmbgs (17.32 inbgs), as the moisture monitor required the soils to remain undisturbed below this depth to give accurate readings. After the monitor was inserted, the excavated soils were replaced so as to approximate the prior stratigraphy as closely as possible.



Figure 14. Unit C excavation area, facing north.

Artifact Analysis

While it was anticipated that large quantities of historic cultural material might be recovered during the course of excavations at Madame John's Legacy, artifact density was even higher than expected, especially in Unit A. The preservation at this locus of a dense deposit of debris likely originating with the 1788 fire (and the partial destruction of the previous building on the lot) has provided substantial insight into the use of the ground floor of Madame John's at the time of the fire. In addition, it appears that the ground surface from the French Colonial period is well-represented throughout the area beneath the level of the extant structure's foundations. Contexts associated with this early period in the city's history also produced a rich material record, particularly considering the relatively small area in which the present investigations were restricted.

Because of alterations to the schedule of investigations necessitated by the difficulties presented by the slab surface encountered in Units A and B, not all artifacts could be washed and processed on site. However, selected contexts were processed, and additional materials will be washed and processed at the University of New Orleans Department of Anthropology's laboratory facilities at the Lakefront Campus. The following discussion is preliminary and is meant chiefly to outline the scope of planned analyses to be submitted with the draft report of investigations to the Louisiana Division of Archaeology.

Initially, all excavated soils were screened through 1/4" mesh, and all cultural materials were collected. This included both typical curatable artifacts, including ceramics, glass, ferrous and cuprous metals, animal bone, and personal items, and non-curatable artifacts, including brick, mortar, and other bulk construction material, coal, slag, cinder, and oyster and rangia shell. Oftenm, on artifact-rich urban sites, the non-curatable material is sampled and/or weighed in the field, as the quantities of construction material recovered make it redundant and create storage issues. However, because the present investigations were so limited in scope, it was elected to collect a one hundred percent sample of cultural material from all historic levels in Units A and B. It was hoped that two main goals could be accomplished by doing this. First, as the construction sequence on the Madame John's lot has been a subject of considerable previous research, it seemed possible that quantities and types of brick rubble could more sensitively reflect renovations and demolition episodes than is typical for urban contexts. In addition, one of the focal points of the present investigations was eighteenth century deposits. In the author's prior experience on sites in New Orleans, grab collections of construction material often unintentionally include materials like hand-built pottery, wheel-thrown coarse earthenware storage vessels, and specialized construction debris like bousillage. This suggests that such materials may also being culled as non-curatable artifacts due to the difficulty in distinguishing them from more common brick rubble, especially in sticky, clayey soils. While this methodology was maintained for most contexts, a few contexts were so dense with large brick fragments that a portion of this material was examined and then weighed on site. These brick weights will be incorporated with summary tables in the draft version of this report.

After processing, all ceramics will be classified and counted according to standards in historical archaeology, and back marks will be identified and dated wherever possible. Ceramics fragments will be additionally identified and sorted by vessel when possible, in order to estimate minimum numbers of vessels represented. The majority of ceramic material recovered dates to one of three general temporal contexts, considered here in chronological order. Material from the French and pre-fire Spanish Colonial Period (ca. 1725-1788) is characterized by tin-enameled pottery, including both French faience and Spanish majolica, glazed earthenwares, including lead-glazed redware and Saintonge-glazed wares, Chinese porcelain, and Native American pottery, particularly undecorated and red-slipped shell-tempered varieties. Debris from the 1788 fire is characterized by large quantities of burned English creamware, Spanish and

southern French olive jars, and lesser quantities of tin-enameled ware. Finally, in both Unit A and B, a lens of midden representing the early nineteenth century use of the building (ca. 1790-1810) included creamware and decorated pearlware, including shell-edged, hand-painted, and transfer-printed varieties.

When processed, glass will be described by color, manufacturing attributes, physical characteristics, and function when identifiable, following the terminology used in Jones and Sullivan (1989). At minimum, all shards will be sorted by color and counted. Marked and embossed bottles will be identified and dated using available sources whenever such data is available. In general, glass was not as numerous as ceramic material in excavations, although olive wine and beer bottle glass and colorless lead glass tableware was noted. All other artifacts will be described as fully as possible with reference to material, form, method of manufacture, and function. When possible, any distinctive markings will be identified and dated. Some distinctive artifacts are discussed in the section on Conclusions and Recommendations below.

A total of 10 soil samples, typically measuring 10 L in volume, were taken during excavation. These samples will be defloculated in a baking soda solution and floated according to industry standards, with a 0.5 mm (0.2 in) geological sieve used to catch the light fraction, and a 1.6 mm (0.06 in) hardware screen used within the flotation tank to catch the heavy fraction. Light fractions (along with any other possible plant remains) will be collected for separate paleoethnobotanical analysis, with emphasis on the best preserved Colonial-era contexts for these analyses. Ethnobotanical analyses will be conducted by Justine McKnight, who has extensive previous research experience with analyzing samples from New Orleans and southeast Louisiana. Additional artifacts recovered during flotation (particularly small-sized artifacts like faunal material, lead shot, and beads) will be incorporated with the appropriate proveniences for analysis.

Although the levels associated with the 1788 fire produced a surprisingly small quantity of animal bone, especially considering the density of ceramic material, the deeper levels produced a distinctive assemblage characterized by exceptional numbers of fish and bird bone. It is anticipated that flotation will further increase this assemblage. Faunal analysis will be conducted by Earth Search, Inc., of New Orleans, Louisiana. The early colonial deposits may be particularly interesting in this regard, as both garfish (identified by a gar scale) and turkey were noted during excavation. Use of these species may be indicative of distinct patterns in Colonial diet, an issue recently discussed by Dawdy in reference to other archaeological assemblages.

After completion of all analyses, materials recovered will be prepared for curation according to the standards set by the Louisiana Division of Archaeology. This will include labeling, bagging, and boxing, the preparation of an artifact catalog, and the production of an archival copy of all associated excavation records and materials. All materials will be submitted to the Louisiana State Museum for curation.

Conclusions and Recommendations

Effects of Modern Renovations. Perhaps the most dramatic result of the present investigations in terms of the goals of the larger study that initiated fieldwork was the documentation of the extent of alterations to the interior stratigraphy since Shenkel's 1971 excavations. In Shenkel's Unit 7 (Shenkel n.d.:46), he noted that the ground surface at the front of the structure was a very deteriorated herringbone pattern brick floor, although from historic photos of the ground level, this pattern was not characteristic of all interior rooms. Whatever the case, there appears to be no trace of this earlier floor extant now, nor of the upper 30 to 40 cm (11.81 to 15.75 in) of fill beneath it. Shenkel notes a wood-lined drainage system directly beneath the prior floor, and it is possible that the renovation episode that resulted in the present

floor (Context 1) was intentionally meant to remove this. In its place, a layer of clean sand fill was placed throughout the interior of the structure, followed by a layer of plastic sheeting. This sheeting was extended to the interior walls of the structure, where it typically lays directly against them. On top of this, a metal mesh frame and cement was placed, with the cement forming two distinct layers: loose unconsolidated mortar and a hard, dense slab, into which a herringbone pattern St. Joe brick floor was laid. Accounts from before this renovation episode cite the extent to which use had impacted the earlier floor and caused slumping towards the center of rooms, and the Context 1-6 construction was undoubtedly meant to rectify this. The resulting floor surface is very level, and the remnants of wooden stakes placed during its construction likely attest to the efforts made in this regard.

This construction effort, apparently dating to the 1990s, has undoubtedly impacted natural processes in the soils beneath Madame John's. The Context 6 sand layer is unusually dry for any subsurface soils in the New Orleans area, and, although the plastic moisture barrier is located above it, the entire Context 1-6 leveling episode would have influenced subsequent developments in the interior walls. It has also adversely affected the archaeological potential of the site as a whole. While late-nineteenth and early-twentieth century deposits may not represent the most unique aspects of the Madame John's site's history, it would appear that much of the archaeological record of the structure's interior use in this later period has been impacted. On the other hand, because soils in urban New Orleans are typically heavily inundated, it is difficult to assess the degree to which this has affected the moisture content of the soils beneath it. While Contexts 13, particularly Level 2, and Context 17 displayed some unusual qualities (in that they became much stickier and wetter in the screen that they appeared to be in situ), this probably relates more to the amount of burned and carbonized material within them than to the overlying stratigraphy.

Historic Cultural Stratigraphy and Construction Chronology. As noted by Dawdy (1998:26), there has been a great deal of speculation regarding the architectural history of the extant Madame John's Legacy building. Maps dating as early as the 1731 Gonichon map of New Orleans depict a structure broadly matching the size and location of the existing building. That this structure was at least partially destroyed by the 1788 New Orleans fire has been indicated by a building contract between Manuel Lanzos, owner at the time of the fire, and an American builder using materials "salvaged from his burned houses" (cited in Dawdy 1998; Wilson 1987:338). The wording of this contract (along with some sources that suggest the fire did not entirely level this block) has left open the possibility that portions of the foundations for the original French Colonial-era structure may have been re-used, even to the extent of being built directly into the existing building. Dawdy, based upon her investigations in the courtyard, suggests that the earlier building was not a complete loss, and that "walls were probably left standing and may have even been incorporated into the 1788 Robert Jones reconstruction" (Dawdy 1998:122). However, she leaves the reservation that only much larger-scale excavations examining wall trenches around the building could ultimately resolve this question.

The present investigations, though limited in extent, may provide some architectural evidence that sheds some additional light on this question. At this point, pending full analysis of the recovered material from the excavation, the suggestions here are tentative, and a more extensive discussion of this issue will be provided in the final report of investigations. The stratigraphy in Units A and B is broadly comparable, in that, for instance, both provided extensive evidence of the 1788 fire, both in debris and in a carbon-rich ashy lens likely representing the event itself. However, small variations in the construction of the lower levels of the foundation wall of the Madame John's structure, and in its relationship to the observed soil layers, may offer some clues to portions of the building that survived the 1788 fire more intact than others.



Figure 15. Foundation of front wall (Context 33) at Madame John's Legacy showing step outwards in Unit B (facing north).



Figure 16. Foundation of rear wall (Context 16) at Madame John's Legacy. Note less prominent step outwards and wooden feature (Context 24) in levels beneath the footing.

In Unit A, the layer of carbonized material and ash associated with the 1788 fire (Context 18) abuts directly with the lowest courses of the brick wall, as do the various layers of fire-related debris (Context 12, 13, and 17) and the apparent compact surface from just after the fire (Context 10). Contrary to expectations if the rear foundation of the extant structure had been built at this time, there is no evidence of a construction trench in profile. On the other hand, while it was scarcely visible during excavation, a construction trench is clearly visible in the east wall of Unit B. The loose fill of Context 19 cuts through Contexts 21 and 22, a layer of brick rubble (debris likely spread after the fire) and the carbon and ash-stained layer beneath it. The interface between these three layers remains somewhat irregular in profile, and there is some possibility that the bottom course of the brick wall exposed in Unit B (Context 33) may be original to the pre-fire structure on the lot, with the most badly damaged portions of the wall repaired and patched in an irregular fashion.

That this is the case is further suggested by differences in the brickwork in the walls (Figures 15 and 16). The single step outwards of the Madame John's foundation was noted by Shenkel in his prior work at the site. It was noted during the present investigations that this step out differed by about 5 cm (1.97 in) between the foundations exposed in Unit A (Context 16) and Unit B (Context 33). In other words, the lip formed by the Unit A step extends to the north 3 cm (1.18 in), while that formed in Unit B extends to the south a full 8 cm (3.15 in), much closer to a whole brick in width. Furthermore, it was noted during profile drawing that two distinct lengths of brick comprised the walls. Although the brick bond at Madame John's is not very consistent even within a single wall, it was noted that all of the stretcher-laid brick in the subsurface portion of the Context 16 wall measure 20.5 cm (8.07 in) in length. However, the subsurface portion of Context 33 (the north wall) is comprised predominantly of brick that, when exposed as stretchers, measure 22 cm (8.66 in) in length. Occasional bricks of the 20.5 cm length are incorporated into this wall as well, and the shorter bricks are the only ones found in the possible earlier (bottommost) course of this wall. While the brick collected during excavation will need to be analyzed to further test this theory, it is possible that this small difference in stretcher brick size may be a quick way to assess areas of the structure that were extensively repaired and/or rebuilt in the 1788 construction. Of course, since it is known that materials were re-used in this effort, the presence of the shorter, presumably earlier brick is not sufficient by itself to allow association with the earlier structure.

Research Potential of Archaeological Deposits. As discussed above, even though the archaeological record within the structure at Madame John's has been previously impacted, the limited excavations undertaken as part of these investigations have demonstrated that rich deposits dating primarily to the eighteenth century are preserved in at least portions of the interior. The greatest part of this material is associated with the period of the 1788 fire or earlier. While a detailed assessment of the results of the present investigations must await analyses of artifacts and of special samples, a few particular areas for further research are already apparent.

In each unit, possible structural features associated with the French Colonial period were uncovered. In Unit A, remains potentially representing a post-in-ground or post-on-sill structure were located near the interface with sterile subsoil. These extended underneath the present wall foundation to the south, potentially linking them to similar deposits documented by Shenkel to the southwest of the present unit. While results were inconclusive as to whether the possible posts (and the potential trench in which they were located) were actually structural, a layer of brick resting on subsoil (Context 23) formed a surface that likely predates the structure shown on the 1731 Gonichon map. Even more intriguing in this regard is the possible plank wall (Context 30/31) located in Unit B near the interface with the subsoil. While this could be the remains of a historic fence line (or even just a particularly linear relict root, rodent, or crawfish hole), the fact that it skews slightly from the existing street grid is suggestive of the archaeological signature of some of the early palmetto huts utilized by colonists while land was being cleared for the

establishment of the city. Such construction has a parallel in the possible palmetto hut excavated as part of the St. Anthony's Garden Project at St. Louis Cathedral. During this project, a similar linear alignment of decomposed wood not matching the existing street grid, with a narrow associated wall trench, was excavated. However, in this case, the larger excavation unit size allowed for a sufficient length of the wall to be exposed that square hewn wooden posts, including a large corner post, were also recorded. At the time, this was interpreted as one of the earliest structures excavated to date in New Orleans. Further delineation of the Context 30/31 feature in Unit B could potentially suggest comparable dates for its construction, although this interpretation must be taken with caution unless more is exposed.

Likewise, the 1788 fire levels at the site also suggest some unique research issues regarding the distribution of activities within the eighteenth century household. If the interpretation tentatively suggested here is correct, and the material deposited in Unit A represents objects stored in the ground floor of the initial Madame John's structure in situ, the distribution of material could be indicative of specialized activities throughout the ground floor area. Already, the concentration of olive jar fragments and other specialized ceramic types in Unit A (Figures 17 and 18) may suggest distinct functions of this room historically. Of course, other unique items throughout these deposits, like the 1722 9-denier coin mentioned above, also provide a great deal of information about social life and the circulation of objects in the Spanish Colonial period. Additional interpretations of artifacts and their applicability to research issues involving foodways, ethnicity, and daily life are under preparation. Once flotation samples and fine samples are washed and processed, and that additional artifacts are examined in detail, it is expected that these interpretations can be refined and expanded considerably. Dawdy's previous work has provided a number of rewarding anthropological research issues through which to interpret the material recovered, particularly in conjunction with the detailed historical background that has been previously elaborated (Dawdy 1998, 2008).

Recommendations. While no further subsurface investigations are planned at the present time, it is clear that archaeological remains underneath Madame John's continue to maintain integrity and research potential, and that these deposits continue to be eligible for inclusion in the National Register of Historic Places under Criterion D. Should renovations or alterations of the interior necessitate removal of the existing brickwork and slab, the sand fill associated with their installation may be considered as providing a buffer protecting these deposits. However, any such effort would also provide a unique opportunity for more extensive investigations into the use of the structure's interior space during the Spanish Colonial era. In addition, because the building itself has protected some of the earlier French Colonial deposits preserved beneath it, these deeply buried strata would provide additional unique research opportunities.



Figure 17. Fragments of olive jars from Unit A, Context 13, Level 2 (58-63 cmbd).



Figure 18. Burned creamware, faience, and Rhenish stoneware from Unit A, Context 13, Level 2 (58-63 cmbd).

References Cited

Clark, John
1970 *New Orleans 1718-1812: An Economic History.* LSU Press, Baton Rouge, Louisiana.

Dawdy, Shannon
1998 *Madame John's Legacy (16OR51) Revisited: A Closer Look at the Archaeology of Colonial New Orleans*. Report submitted to the Friends of the Cabildo and the Louisiana Division of Archaeology, Baton Rouge, LA.
2000 Understanding Cultural Change through the Vernacular: Creolization in Louisiana. *Historical Archaeology* 34(3):107-123.
2008 *Building the Devil's Empire: French Colonial New Orleans.* University of Chicago Press, Chicago and London.
2010 **"**A Wild Taste": Food and Colonialism in Eighteenth-Century Louisiana. *Ethnohistory* 57(3): 389-414.

Dawdy, Shannon, Ryan Gray, and Jill-Karen Yakubik
2008 *Archaeological Investigations at the Rising Sun Hotel Site (16OR225), New Orleans, Louisiana, Volume I.* Report prepared for the Historic New Orleans Collection, New Orleans, Louisiana.

Douglas, Lake
2011 *Public Spaces, Private Gardens: A History of Designed Landscapes in New Orleans*. LSU Press, Baton Rouge, Louisiana.

Jones, Olive and Catherine Sullivan with contributions by George L. Miller, E.Ann Smith, Jane E. Harris, and Kevin Lunn
1989 *Parks Canada Glass Glossary for the Description of Containers Tableware, Flat Glass, and Closures.* Canadian Parks Service, Quebec, Canada.

Kraljevich, John
2012 First 'American' Coppers. *Coin World Magazine*, article published October 22, 2012 at. http://www.coinworld.com/Articles/ViewArticle/first-american-coppers. Accessed August 2013.

Shenkel, J. Richard
n.d. Archaeological Investigation of Madame John's Legacy, 1971. Manuscript on file, University of New Orleans.

Yakubik, Jill-Karen
1990 *Ceramic Use in Late-Eighteenth-Century and Early-Nineteenth-Century Southeastern Louisiana.* Doctoral dissertation, Department of Anthropology, Tulane University, New Orleans, LA.

Appendix E.

Site Visit Report. Consultation on Moisture Migration.
Michael Henry to John Stubbs
August 26, 2013

WATSON & HENRY ASSOCIATES

26 August 2013

Professor John H. Stubbs
Director, Master of Preservation Studies
Tulane School of Architecture
6823 St Charles Avenue
New Orleans, LA 70118

Subject: **Site Visit Report**
Consultation on Moisture Migration
Madame John's Legacy Technical Conservation Studies Project
632 Dumaine Street
New Orleans, LA

Dear Professor Stubbs:

This letter addresses activities, observations and recommendations resulting from the site visit by Watson & Henry Associates (W&HA) on 06 and 07 August 2013 for the Madame John's Legacy Technical Conservation Studies Project in New Orleans, LA.

Madame John's Legacy (1788) is a National Historic Landmark and a property of the Louisiana State Museum. The masonry walls and piers of the ground floor of the building have a long history of damage from migration of moisture and salts and have been the subject of several studies, mitigative actions and repairs.

The ground floor masonry at Madame John's Legacy is currently the focus of a Technical Conservation Studies Project by the Tulane School of Architecture, funded by the Louisiana State Historic Preservation Office and the Louisiana State Museum. The Tulane School of Architecture (TSA) has engaged Building Conservation Associates (BCA) to analyze the building materials.

The purpose of the site visit by Michael C. Henry of W&HA was to:
- Assist in deployment of dataloggers and sensors for wall and soil moisture monitoring;
- Advise on use of infrared thermography for imaging moisture in the wall;
- Advise the TSA/BCA team on matters related to moisture migration.

This consultation is for building materials pathologies, their diagnosis and potential conservation; this consultation specifically excludes services for Architecture or Engineering.

Other parties participating in the site visit were:
- Dorothy Krotzer, Building Conservation Associates/Tulane School of Architecture;
- Michael Shoriak, Cypress Building Conservation, Inc.;
- Courtney Williams, Cypress Building Conservation, Inc.;
- D. Ryan Gray, Ph.D., RPA, University of New Orleans and a team of archaeologists and technicians.

Dorothy Krotzer provided project leadership and coordination for the site visit and the above team.

Deployment of Dataloggers and Sensors for Wall and Soil Moisture Monitoring

The intent of the monitoring effort is to determine the variation of the vertical gradient of wall moisture over one year and to determine the extent to which variations in wall moisture are influenced by variations in soil moisture and variations in room relative humidity. The moisture readings in the wall, soil and air will provide an understanding of the dynamic exchange of moisture liquid and vapor between the wall and its environment. Understanding the dynamic moisture exchange, combined with material testing information on the brick, mortar, soils and salts will inform the selection of potential strategies to mitigate deterioration of the wall.

To this end, a datalogger and several sensors were deployed to measure wall and soil moisture at wall NE4 of basement room 281. A second datalogger to monitor room conditions was deployed after the site visit.
The wall moisture monitoring approach is a refinement of a method successfully used by W&HA at Frank Lloyd Wright's Unity Temple (1909) in Oak Park, Illinois and the soil moisture monitoring has been successfully used by W&HA at Lynnhaven House (c.1725) and the Adam Thoroughgood House (c.1700) in Virginia Beach, Virginia.

The wall and soil monitoring devices are itemized in the equipment list attached to this letter.

Wall moisture can be indirectly indicated by temperature and relative humidity sensors inserted into small air chambers created in the center of the wall at various heights. The relative humidity in the air chamber equilibrates with the moisture content of the surrounding masonry, the relationship being indicated by a sorption isotherm (Figure A) and the various stages of moisture uptake occurring on the generic sorption isotherm (Figure B)

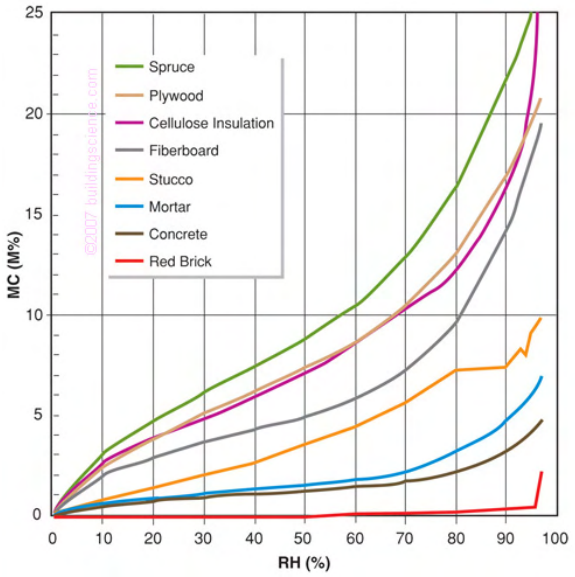


Figure A. Sorption isotherm for typical building materials[1]

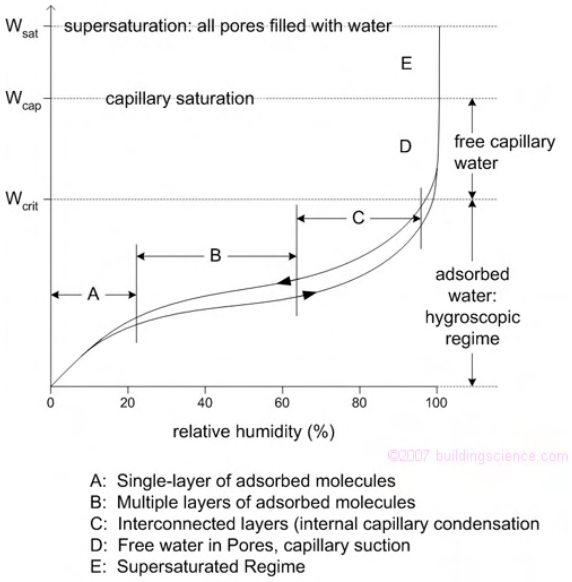


Figure B. Material wetting/drying regimes[2]

The moisture content along the vertical centerline of a masonry wall with symmetric cross-section, subject to below-grade moisture source and capillary transport is indicative of the highest likely moisture levels in the wall and avoids the effects of the horizontal moisture gradients between the centerline and the wall surfaces.

The intrawall relative humidity measurement will also inform analysis of the risk of salt crystallization within the masonry, once the salts are identified. The number of cycles that relative humidity in the masonry passes through the critical relative humidity value for deliquescence/acquiescence of the identified salt(s) will indicate the prospect for intrawall crystallization and/or phase change with volumetric implications.

[1] http://www.buildingscience.com/documents/digests/bsd-138-moisture-and-materials Accessed 24 August 2013.
[2] http://www.buildingscience.com/documents/digests/bsd-138-moisture-and-materials Accessed 24 August 2013.

At Madame John's Legacy, temperature and relative humidity sensors (3) and the soil moisture sensor (1) were installed at the following positions:

Sensor identification	Location, relative to finish floor (FF)
10375781 MJL281 NE4 Wall T&RH	11 inches above FF at wall center
10375782 MJL281 NE4 Wall T&RH	35 inches above FF at wall center
10375783 MJL281 NE4 Wall T&RH	61 inches above FF at wall center
10393903 MJL281 NE4 Soil Moisture	15 inches below FF, 12 inches away from wall

Henry specified the devices and compatible HOBOware Pro® Software. Krotzer arranged for procurement of the equipment through BCA. Shoriak and Williams assembled and deployed the datalogger and sensors with technical direction from Henry. Gray directed the disassembly of the floor and archaeological excavation of the floor pit for the soil sensor installation.

Prior to installation, the temperature and relative humidity sensors were checked for consistency to confirm that sensor damage had not occurred during transit or assembly with the datalogger; differences in readings were well within factory specifications. The soil moisture sensor was tested by immersion in bottled water; a reading of 0.4899 m^3/m^3 was within the manufacturer's allowable range of 0.474 to 0.692 m^3/m^3 for water immersion. Free air readings were also within specification.

The wall sensors are inserted into tight-fitting plastic tubes. A space between an end cap on the tube and the sensor cap forms a small air chamber to which the sensor is exposed. The tubing wall is perforated at the chamber to allow moisture vapor exchange with the masonry. At the cable end of the tubing, a split-ring grommet is fitted between the tube and the cable to prevent moisture vapor entry from the room. The tubing and sensor assembly are carefully inserted in a tight borehole in the masonry wall, and the small annular space between the tube and the brick is packed with putty at the wall surface.

The soil sensor is inserted vertically into the undisturbed soil below the floor assembly. At Madame John's Legacy, the floor pit was then backfilled with excavated soils, compacted, then the vapor retarder applied over the fill and the floor assembly reconstructed using sand, broken concrete (in lieu of the concrete slab) and brick.

A separate datalogger was installed for measuring temperature and relative humidity of the air in room 281 was installed by Shoriak on 23 August.

The datalogger records readings from the soil and wall sensors record conditions at one hour intervals. The room air datalogger records conditions at 15 minute intervals; a shorter interval is used for this device to detect any changes in room conditions from HVAC equipment cycling or occupancy.

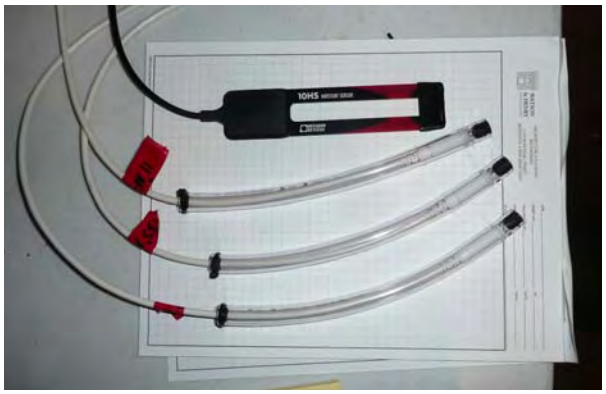


Figure C. Soil sensor (1) and wall temperature and relative humidity sensors (3) before installation.



Figure D. Wall T & RH sensor installed.



Figure E. Soil moisture sensor before backfill.

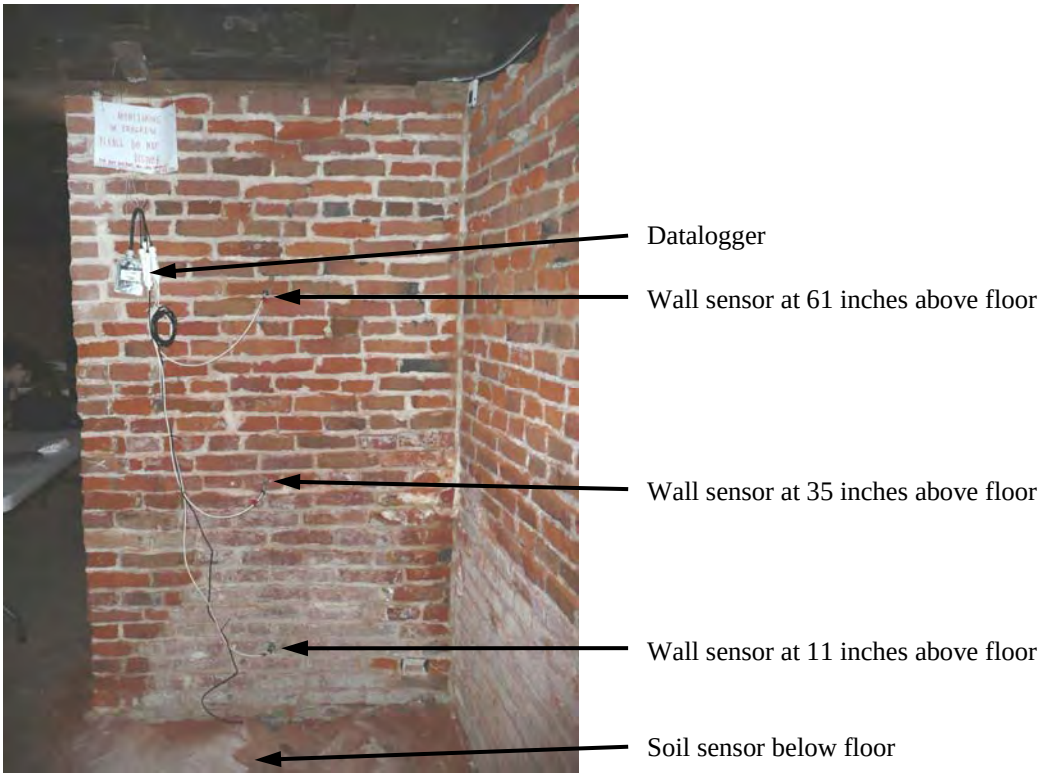


Figure F. Completed installation

Infrared Thermography and Moisture Detection in the Wall

Infrared thermography may provide a non-invasive method for assessing moisture content of the wall masonry; but infrared thermography cannot duplicate a datalogger function of capturing time-based trend data. At Madame John's Legacy, infrared thermography was employed in a trial application in order to comparatively assess infrared thermography with embedded sensors.

In infrared thermography, the camera reads the *incident energy* of the scanned surface. *Incident energy* is the sum of the *emitted energy* from the surface, the *transmitted energy* passing through the material behind the surface and the *reflected energy* off the surface. The *emitted energy* is indicative of the actual surface temperature, so other energy influences must be accounted for when interpreting the image.

At interior wall NE4 in Madame John's Legacy, transmitted energy through the wall section is nil and reflected energy from incandescent lighting is negligible, so the incident energy is essentially the same as the emitted energy. In the absence of applied thermal energy sources, the measurement is considered passive thermography.

Variations in surface temperature of wall NE4 result from the thermal energy balance of the wall with its surroundings; in the absence of rapid or large change in the environmental conditions, the thermal energy balance will approach a steady-state condition.

The thermal energy balance will be affected by:

- Thermal energy exchange between the wall and the room air resulting from: temperature difference between the wall and room air; convective air movement at the wall surface, and evaporative cooling at the wall surface due to moisture exchange with room air;
- Thermal energy balance between the wall and the soil surrounding the base of the wall, the soil acting as a slight heat sink because of its lower temperature;
- Conductive thermal energy movement within the wall due to: different materials; discontinuities or voids within the material or at contact surfaces between materials; variations in material density; and variations in moisture content.

In situations where surface temperatures are strongly influenced by moisture content, infrared thermography may be used to detect moisture gradients at or near the surface of the object; thus the interest in using infrared thermography at Madame John's Legacy.

Shoriak scanned wall NE4 using a Fluke TiR32 Thermal Imaging Camera provided by BCA; Shoriak is experienced in this device having used one for an investigation of wood deterioration. The scans were taken immediately prior to installation of the sensors.

Shoriak and Henry also carefully examined trial thermal scans and data for wall NE4. It was noted that blister-like salt crusts which are separated from the brick face by a small air pocket will give a false reading of surface temperature. This is to be expected, given the discontinuity and is general limited to select areas of the salt formations, most of the salts being attached to the brick. Spot readings at these discontinuities will occur, but in the context of scans of large areas, they are unlikely to have an impact.

Evaluation of Initial Sensor Data and Benchmark Infrared Thermal Scans

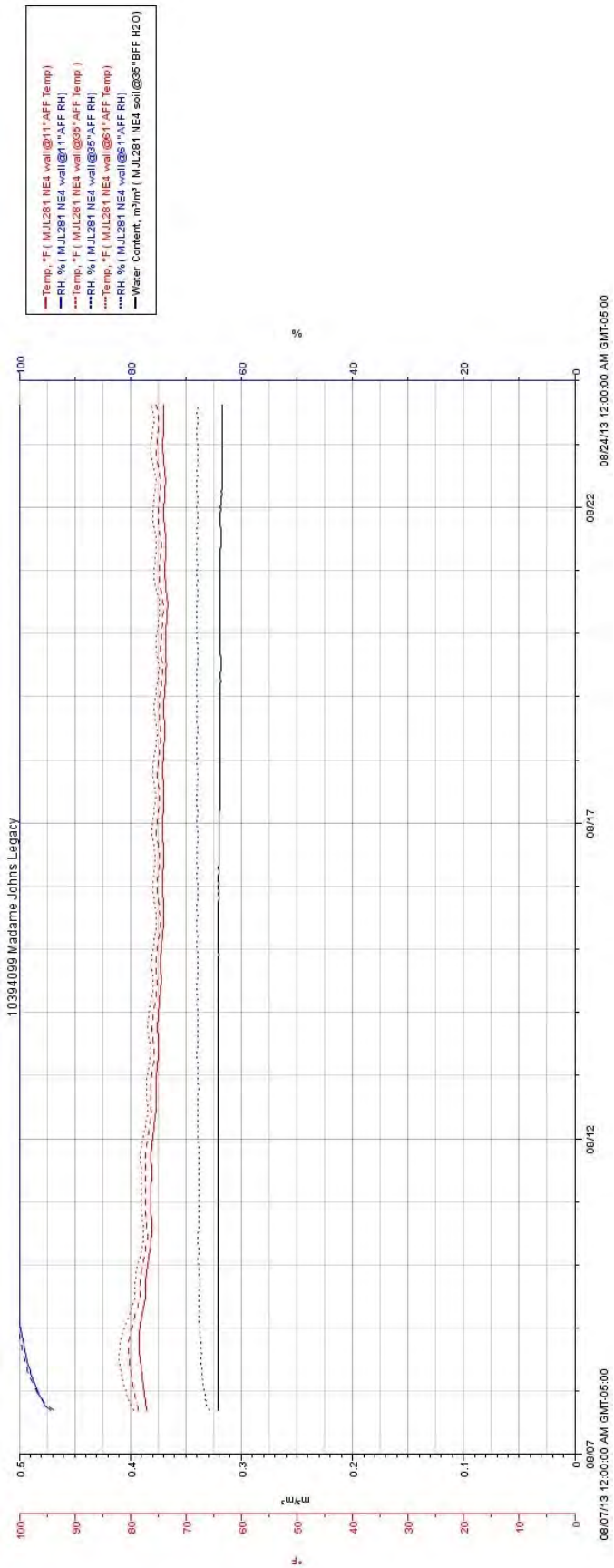
Time-based trend data plots for the wall and soil sensors for the period from initial installation on 07 August through 23 August are presented in Figure G on the following page. The data indicate the following:

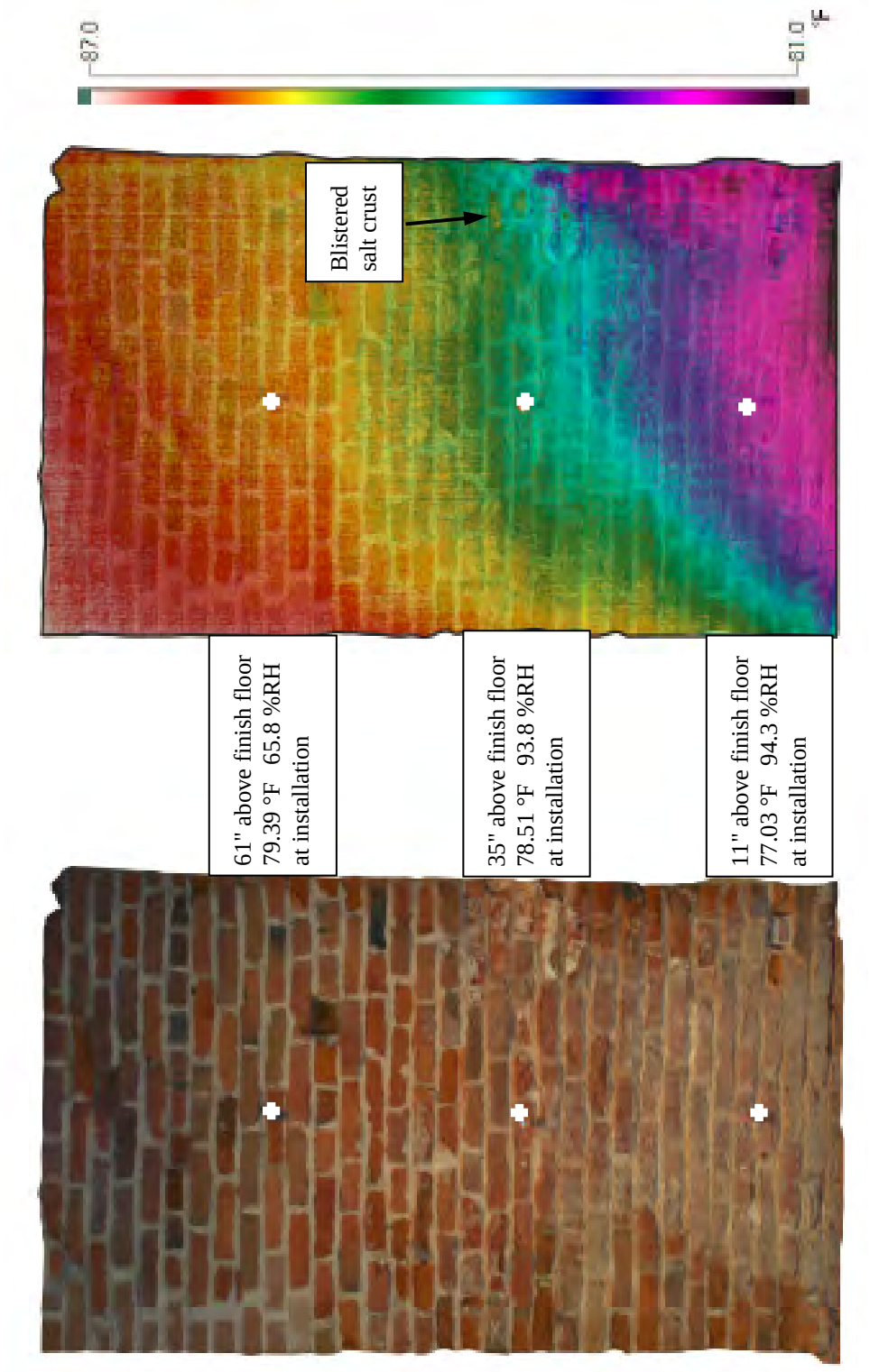
- Wall core temperature averaged:
  74.95 °F at 11 inches above finish floor;
  75.92 °F at 35 inches above finish floor;
  76.78 °F at 61 inches above finish floor;
- Wall core relative humidity averaged:
  99.8 %RH at 11 inches above finish floor;
  99.8 %RH at 35 inches above finish floor;
  67.8 %RH at 61 inches above finish floor;
- Soil moisture averaged:
  0.3199 m^3/m^3 at 15 inches below the floor.

The moisture levels in the wall and soil were disturbed somewhat by installation of the sensors. Moisture levels inside the wall appear to have returned to equilibrium within 60 hours. However, soil moisture data suggests a slight drying trend; this may be due to either generalized subsurface moisture changes or vapor leakage at the test sensor location where the floor opening was filled.

Shoriak produced conventional (Figure H) and infrared images (Figure I) of Wall NE4 immediately prior to installation of the sensors; select sensor data have been added by Henry to the images.

When compared, direct observations of salt damage, instrumented readings of wall moisture and infrared thermal scans of the NE4 wall are generally consistent and correlate well to each other. Notably, the temperature gradient of the wall core is quite small, suggesting that thermal images of the wall surface will be more indicative of density differences (due to moisture) and evaporative cooling at the wall surface than of actual thermal gradients due to the influence of soil temperature at the wall base.


Temp, °F (MJL281 NE4 wall@11"AFF Temp)
RH, % (MJL281 NE4 wall@11"AFF RH)
Temp, °F (MJL281 NE4 wall@35"AFF Temp)
RH, % (MJL281 NE4 wall@35"AFF RH)
Temp, °F (MJL281 NE4 wall@61"AFF Temp)
RH, % (MJL281 NE4 wall@61"AFF RH)
Water Content, m³/m³ (MJL281 NE4 soil@35"BFF H2O)
10394099 Madame Johns Legacy
%
m³/m³
°F
08/07/13 12:00:00 AM GMT-05:00
08/12
08/17
08/22
08/24/13 12:00:00 AM GMT-05:00


87.0
81.0 °F
Blistered salt crust
61" above finish floor
79.39 °F 65.8 %RH
at installation
35" above finish floor
78.51 °F 93.8 %RH
at installation
11" above finish floor
77.03 °F 94.3 %RH
at installation

Recommended Next Steps

The moisture conditions in the room air, walls and soils at Madame John's Legacy must be monitored for several months, preferably through four full seasons, before the data can be analyzed and potential mitigative strategies identified.

The salts in the wall that have been identified to date – sulfates, sodium chloride, sodium nitrate and potassium nitrate – present a complex problem with respect to critical relative humidity point(s) and potential volumetric change with phase change or supersaturation; these implications must be investigated before changes in moisture content of the wall or the interior environment can be made. If the moisture content of the wall is decreased without reducing the high salt content, there is a prospect that intrawall fracturing and cleaving will take place as salts crystalize or solutions become super saturated. This damage mechanism was witnessed in some of the core samples taken from the walls.

Shoriak has proposed to take responsibility for monthly downloads of the dataloggers and transmission of the data files to Henry. Shoriak is experienced with the dataloggers and software and can be relied on for the necessary consistency and care to avoid data loss. His involvement should continue.

Infrared thermography may be a useful method for assessing moisture levels in walls other than NE4, avoiding the need to bore and instrument the walls. However, additional correlation between infrared imaging and moisture sensor readings are needed. To this end, infrared scans should be made by Shoriak using the Fluke TiR32 camera on a periodic basis, not less than every three months, and the images compiled so that Henry can compare the scans to the sensor data.

Summary

Dorothy Krotzer has assembled a highly collaborative cross-disciplinary team for this investigation and the field work has been a genuine pleasure.

W&HA looks forward to continuing participation in this important and challenging project and looks forward to receiving the monthly data for further analysis as well as further evaluation of the application of infrared thermography to moisture assessment at this site.

Respectfully,



Michael C. Henry, PE, AIA
NJ PE 25633 NJ RA 11115

MCH/
MCH Aug 2013 MJL site visit report 26Au13 Final.doc

Attachments:
Monitoring Equipment List

Environmental Monitoring Equipment for Moisture Issues at Madame John's Legacy
New Orleans, LA
Proposed Equipment Basic Budget

Wall and Soil Moisture Monitoring Equipment (Budget version, 4 measurement points: 1 soil, 3 wall) Must use existing U10 datalogger for ait T/RH	**Catalog No.**	**Quantity**	**Unit Price**	**Total**
HOBO Micro Station Data Logger H21-002 (4 sensor capacity, sufficient for 1 wall & 1 pit location) http://www.onsetcomp.com/products/data-loggers/h21-002	H21-002	1	$231	$231
HOBO STHB-M008 exterior T/RH sensor w. 8.2 ft cable. Insert in center of wall, one at bottom (6-12 inches above finish floor), remaining two at equally spaced at third points vertically between sensor 1 and top of wall, 3 per wall location (3 sensors). http://www.onsetcomp.com/products/sensors/s-thb-m008	STHB-M002	3	$189	$567
HOBO 10HS Soil Moisture Smart Sensor (10HS) with 16 ft cable, 1 per test pit per wall location (1 sensor) http://www.onsetcomp.com/products/sensors/s-smd-m005	S-SMD-M005	1	$139	$139
Software and accessories				
HOBOware Pro software (Windows compatible) with interface cable	BHW-Pro-CD	1	$99	$99
HOBO ADAPT-SER-USB, USB interface adapter for downloading to laptop	ADAPT-SER-USB	1	$59	$59
HOBO Replacement RH sensor caps (package of 5)	HUM-RHCAP-2	1	$48	$48
Misc. mounting hardware/materials	allowance	1	$25	$25
Shipping, Insurance	allowance	1	$100	$100
Total Monitoring Equipment (per wall/pit location - budget version)				**$1,037**

Appendix F.

Brick Analysis Report. May 26, 2013.

Mortar and Stucco Analysis Report. May 26, 2013.

(Highbridge Materials Consulting)

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MORTAR AND STUCCO ANALYSIS REPORT

Client:	Building Conservation Associates, Inc.	**Client ID:**	BUIL005
Project:	Madame John's Legacy	**Report #:**	SL0534-01
Location:	New Orleans, LA	**Date Received:**	04/18/13
Sample Type:	Mortar, stucco, and brick	**Report Date:**	05/26/13
Delivered by:	Client (D. Krotzer)	**Petrographer:**	J. Walsh
		Page 1 of 20	

Report Summary

- Two mortar samples and one stucco sample from Madame John's Legacy in New Orleans, LA are examined petrographically for this report.
- Samples 1 and 2 are lime-stabilized, earthen mortars with similar constituents and properties. The earthen binder is a silty clay and this is estimated to represent the majority portion of each sample. The lime is a nonhydraulic binder burned from oyster shell. The mortars are well prepared, blended, and consolidated. The hardened products are soft, permeable, and more or less friable. Both are uniform in appearance. Sample 1 is tan in color and Sample 2 is brown. Both mortars are fully carbonated. No microcracking or salt deposits are detected within the mortar pieces though fine clusters of gypsum crystals are found in association with Sample 2.
- Sample 3 is identified as a pure natural cement stucco containing a narrowly graded quartz sand. The cement dates the installation to no earlier than ca. 1830 and probably no later than ca. 1895. The material appears oversanded. The components are well mixed and relatively well consolidated. The total air content is estimated at 8-10% by volume. The stucco has a moderate hardness and a moderately high permeability. The material is uniform in appearance with a light brownish gray color. Some secondary deposition of calcium carbonate is noted and in some cases the carbonate heals fine microcracks at paste-aggregate contacts.
- A more detailed discussion of these findings may be found in the "Petrographic Findings and Discussion" sections beginning on page 3 of this report.

1. Introduction

On April 18th, 2013, Highbridge received three mortar samples and two brick samples from Ms. Dorothy Krotzer of Building Conservation Associates, Inc. The samples are reported to have been taken from Madame John's Legacy in the French Quarter, New Orleans which dates from 1788. The client describes the structure as a residence in the French Colonial style with a raised brick masonry ground floor and a brick-between-post upper floor. The samples are identified by the client as follows.

MJL.Masonry.1:	Bedding/pointing mortar from the south brick chimney in attic (interior location). Date unknown, may be 1788.
MJL.Masonry.2:	Bedding/pointing mortar from ground floor level brick masonry, rear (southwest) elevation. Date unknown, may be 1788. [Note: sample was removed from a protected area in a closet in the restroom that appears not to have been re-pointed, although area has high amount of moisture and masonry is generally deteriorated]
MJL.Masonry.3:	Exterior stucco, northwest elevation, 14" from grade. Date unknown.
MJL.Masonry.4:	Brick from ground floor level brick masonry, rear (southwest) elevation, location "B". Date unknown, may be 1788. [Note: sample was removed from a protected area in a closet in the restroom, same as sample MJL.Masonry.2.]
MJL.Masonry.5:	Brick from ground floor level brick masonry, rear (southwest) elevation, location "C". Date unknown, may be 1788. [Note: sample was removed from a protected area in a closet in the restroom, same as sample MJL.Masonry.2.]

For the sake of brevity, Highbridge will refer to the samples as 1, 2, 3, 4, and 5 in this report. At the client's request, a petrographic examination of the mortar and stucco samples is performed in order to identify constituent components and assess overall quality. Chemical analysis to characterize the binder chemistry and estimate proportions is excluded from the analysis. Acid digestions to extract sand samples are also excluded. The results of these analyses are presented below. The client also requests a petrographic examination of the brick samples to identify constituent components as well as any signs of distress or other features that might affect durability. These results will be presented under separate cover in Highbridge report SL0534-02.

2. Methods of Examination

The petrographic examination of the mortar is conducted in accordance with the standard practices contained within ASTM C1324. Data collection is performed by a degreed geologist who by nature of his/her education is qualified to operate the analytical equipment employed. Analysis and interpretation is performed or directed by a supervising petrographer who satisfies the qualifications as specified in Section 4 of ASTM C856.

3. Standard of Care

Highbridge has performed its services in conformance with the care and skill ordinarily exercised by reputable members of the profession practicing under similar conditions at the same time. No other warranty of any kind, expressed or implied, in fact or by law, is made or intended. Interpretations and results are based strictly on samples provided and/or examined.

4. Confidentiality

This report presents the results of laboratory testing requested by the client to satisfy specific project requirements. As such, the client has the right to use this report as necessary in any commercial matters related to the referenced project. Any reproduction of this report must be done in full. In offering a more thorough analysis, it may have been necessary for Highbridge to describe proprietary laboratory methodologies or present opinions, concepts, or original research that represent the intellectual property of Highbridge Materials Consulting and its successors. These intellectual property rights are not transferred in part or in full to any other party. Presentation of any or all of the data or interpretations for purposes other than those necessary to satisfy the goals of the investigation are not permitted without the express written consent of the author. The findings may not be used for purposes outside those originally intended. Unauthorized uses include but are not limited to internet or electronic presentation for marketing purposes, presentation of findings at professional venues, or submission of scholarly articles.

5. Petrographic Findings and Discussion (Mortar Samples)

5.1 - General Summary (Mortar Samples)

Samples 1 and 2 are both identified as lime-stabilized, earthen mortars with similar constituents and properties. These are similar enough that a common construction date seems plausible. The earthen binder is a silty clay and this is estimated to represent the majority portion of each sample. The lime is a nonhydraulic binder burned from oyster shell. The mortars are well prepared, blended, and consolidated. The hardened products are soft, permeable, and more or less friable. Both are uniform in appearance. Sample 1 is tan in color (Munsell color code approximately 1Y 7/2) and Sample 2 is brown (approximately 10YR 5/3). Both mortars are fully carbonated. No microcracking or salt deposits are detected within the mortar pieces though fine clusters of gypsum crystals are found in association with Sample 2.

5.2 - Materials (Mortar Samples)

The two mortar samples are best categorized as lime-stabilized earthen mortars. As such, the natural mineral addition is better described as binder rather than aggregate. This binder is a fine silty clay containing similar mineralogies in the coarser silt component. The clay itself may be slightly different given the differences in color between the two samples. Sample 1 is a lighter tan and Sample 2 a medium brown. The clay is very well dispersed in both samples and is not easily resolved at the scale of the light microscope. The approximate quantity of clay would be best assessed through acid digestion. In Sample 1, only a few thin streaks of silty clay are found along a few of the sample surfaces. A low abundance of rounded silty clay lumps usually less than 0.25 millimeters in diameter are found in Sample #2. Virtually no clay linings are identified along the surfaces of silt particles. Minor plant matter is found in Sample 1 and these organic residues are rare in Sample 2.

The silt consists of monocrystalline quartz with minor white mica. The mica is slightly more abundant in Sample 2. Feldspar and glauconite are minor components of Sample 1 and trace components of Sample 2. Both samples contain trace heavy accessory phases including zircon, sphene, tourmaline, epidote, and amphibole. Minor fine-grained carbonate fragments are found in both samples but these are interpreted to represent unburned lime residues dispersed during slaking of the shell lime. The silt grains are sharp-textured with mostly equidimensional particles that are mostly angular in shape. A moderate proportion are shard-like. The material is very fine-grained though the silt in Sample 2 is slightly finer overall. Virtually all material is estimated to pass a No. 100 sieve and a large fraction is finer than a No. 200 sieve.

The calcareous binder in both samples is a nonhydraulic lime burned from oyster shell. The hardened matrix is homogenously developed with high capillary porosity. In Sample 1, undispersed lime grains are present in moderately high abundance as fine-grained particles mostly less than one millimeter in diameter. Undispersed grains are less abundant in Sample 2 but tend to be coarser-grained. The interiors of many lime particles contain internal fractures developed during slaking. These mirror the laminated or herringbone structure of the calcite and aragonite crystals originally present in the shells from which the lime was burned. A minor quantity of unburned shell is also found in both samples though overall the lime is observed to have been well-fired and slaked. Traces of wood cinder are included in Sample 2 presumably representing fuel from the lime calcination. These are not identified in Sample 1. As typically found in shell limes, a minor to trace amount of clay debris was apparently adhered to some of the oyster shells. These have been fired along with the lime to form small lumps of calcined clay and siliceous glass. It is highly doubtful that these were present in sufficient quantity to have produced any significant hydraulicity.

5.3 - Component Proportions (Mortar Samples)

Chemical analyses were not performed and the original proportions are not quantified as part of this study. Based on the petrographic observations, the silt is more than just a minor part of the clay binder. The distribution of components suggests that the mineral addition represents a greater proportion of the total mortar than a normal sand addition would be in a common lime mortar. If an acid digestion is performed, it would be reasonable to estimate that a little less than one half of the weight of soluble material on a dry sample basis would represent the weight of unslaked lime used in the mixtures.

5.4 - Condition and Service Performance (Mortar Samples)
Both mortars are exceptionally well blended with only few clay streaks or fine lumps. The silt is remarkably clean, possibly suggesting that the clay source may have been dry when incorporated into the mix. The lime source is pure despite a few minor contaminants typical of shell limes. The lime was well-fired and the quantity of unburned shell is lower than normally encountered. The slaked lime is well blended into the clay binder with only minor undispersed inclusions and no observed streaking. The mortars are both well consolidated with total air contents less than 2% by volume. The fine spherical voids are generally less than 0.25 millimeters in diameter.

The lime in both samples is fully carbonated and this is a normal and desirable consequence of long-term exposure. The mortars are soft, highly absorptive, and more or less friable. However, there is little sign of microscopic deterioration or secondary mineralization. No microcracks are detected in the larger fragments. No salt deposits are positively identified in the sample pieces themselves. However, a few microscopic fragments of crystallized gypsum are found in association with Sample 2.

6. Petrographic Findings and Discussion (Stucco Sample)

6.1 - General Summary (Stucco Sample)
The sample is identified as a pure natural cement stucco containing a medium to fine-grained and narrowly graded quartz sand. The natural cement dates the installation to no earlier than ca. 1830 and probably no later than ca. 1895. The proportions are not quantified but the sand is densely distributed and the material appears oversanded. The components are well mixed and relatively well consolidated. The total air content is estimated at 8-10% by volume. The stucco has a moderate hardness and a moderately high permeability. The material is uniform in appearance with a light brownish gray color (Munsell color code approximately 10YR 6.5/2.5). Some secondary deposition of calcium carbonate is noted and in some cases the carbonate heals fine microcracks at paste-aggregate contacts.

6.2 - Materials (Stucco Sample)
The aggregate is a medium to fine-grained natural sand consisting almost entirely of quartz and quartzite with traces of chalcedony and fine shell fragments. No clay coatings or friable materials are identified and the aggregate is considered hard, non-porous, and durable for use in cementitious materials. The sand is varied in shape with equidimensional particles that range mostly from subrounded to subangular in shape. Angular grains are more common in the finer grain sizes. The particle size distribution is estimated petrographically rather than through gradation of an extracted sample. The aggregate has a nominal top size estimated technically at the No. 8 sieve. However, there is a strong peak abundance in the range of the No. 30 to No. 50 sieves and the aggregate is narrowly graded. The fines content is moderate. The sand might not comply with modern specifications for aggregate used in exterior plaster. However, the particle size distribution is consistent with the finer end of a range often identified in natural cement stuccoes.

Natural cement is identified as the sole binder with no lime or pozzolanic additions detected. The hardened binder is homogeneously distributed with a moderately high capillary porosity. The higher porosity paste is indicative of a higher mix water content and a highly plastic mix when placed. A higher sand content may have necessitated an increase in mix water content due to a higher water demand. Natural cement residuals are detected in high abundance as variously sized calcined particles up to approximately one millimeter in diameter. Finer, nonhydraulic "grit" representing inert material in the cement is also highly abundant. Chemical analysis was not performed but the internal textures are indicative of a magnesian composition characteristic of American rather than European products. These textures are complex but wholly consistent with the low temperature firing of a silty, clay-rich dolostone and very typical of those produced in the Rosendale, NY manufacturing district.

6.3 - Component Proportions (Stucco Sample)
Chemical analysis was not performed and the original proportions are not quantified as part of this study. Nonetheless, the sand is densely distributed and more concentrated than usually found in historic natural cement stuccoes. Historic stucco mixes were often prepared at cement to sand ratios between 1 : 1 and 1 : 2 by volume. Conservatively, the cement to sand ratio in Sample 3 may be no greater than 1 : 2.5 by volume and the mix appears oversanded.

6.4 - Condition and Service Performance (Stucco Sample)
The original materials are well mixed and there are no sand streaks or cement clots detected. Despite a higher water content, the mix water was well incorporated into the mixture and there is no evidence for inappropriate late retempering. Only one stucco lift is identified at approximately 1/2" to 5/8" thickness. The stucco is well consolidated against the substrate based on the one petrographic sample. There are tightly adhered residues of a lime-based mortar with a fine-grained silty sand. In one area, the lime mortar appears to have "squeezed" outward into the cement stucco. This could suggest a "wet-on-wet" placement but this is speculative. The stucco itself is relatively well consolidated with a total air content of 8-10% by volume. Residues of a light-colored coating remain along portions of the exposed face. However, these contain fully hydrated gray portland cement residuals suggesting that the coating is a later application.

The stucco has a moderate hardness but a relatively high permeability due to a combination of a paste with higher capillary porosity and a moderate air-void content. There is some evidence for leaching and secondary mineralization due to water infiltration through the stucco body. The normally patchy carbonation is reworked and secondary calcium carbonate in the paste is somewhat coarse-grained. Microcracks along paste-aggregate boundaries are also autogenously healed with secondary carbonate in some areas of the examined stucco.

Respectfully submitted,

John J. Walsh
President/ Senior Petrographer
Highbridge Materials Consulting, Inc.

Appendix I: Visual Description of Samples as Received

Sample ID	**MJL.Masonry.1**
Description	The sample consists of several small mortar pieces, a moderate amount of loose powder, and one crescent-shaped dark gray shell fragment. The entire sample weighs a total of 14.7 grams. A joint thickness up to 3/8" and a depth up to 3/4" appear to be represented.
Surfaces	The three larger pieces have one mostly compact and creamy-textured curviplanar bed surface that curves up toward the possible joint face, making the face thicker than the rear. These creamy bed surfaces have adherent brick residues. The opposite sides are irregular, clean, and fresh. The possible joint face is crudely smoothed.
Hardness / Friability	The paste is very soft and the mortar is somewhat friable.
Appearance	Fresh surfaces have a dull luster and are tan in color (Munsell code approximately 1Y 7/2).
Other Details	No cracking, efflorescence, or mineral deposits are observed in hand sample. Fine-grained white binder inclusions up to 1 mm in diameter are present in moderately low abundance. One 1/2" gray shell fragment is also included in the sample. All surfaces of the mortar are rapidly water absorptive.

Sample ID	**MJL.Masonry.2**
Description	The sample consists of multiple rounded mortar lumps, a moderately high amount of loose powder, and some soft red brick residues. The entire sample weighs a total of 36.6 grams. The largest lump is approximately 1" in diameter.
Surfaces	There are no obvious bedding or tooled surfaces.
Hardness / Friability	The paste is soft and the mortar is friable.
Appearance	Fresh surfaces have a dull luster and are brown in color (Munsell code approximately 10YR 5/3).
Other Details	Cracking cannot be assessed in this sample. No efflorescence or mineral deposits are observed in hand sample. There is a very low abundance of very fine-grained white binder inclusions much smaller than 1 mm in diameter. All surfaces are rapidly water absorptive.

Sample ID	**MJL.Masonry.3**
Description	The sample consists of multiple medium-sized stucco pieces weighing a total of 116.2 grams. The pieces are between 1/2" and 5/8" in thickness across the full cross-section of the stucco.
Surfaces	The outer surface has a planar, float type finish with a white residue. Only a few rear surfaces are observed. These are mostly compact and relatively planar. One rear surface has a small sliver of adherent brick.
Hardness / Friability	The paste has a moderate hardness and the mortar is non-friable.
Appearance	Fresh surfaces have a moderately dull luster and are light brownish gray in color (Munsell code approximately 10YR 6.5/2.5).
Other Details	No cracking, efflorescence, mineral deposits or binder inclusions are observed in hand sample. All surfaces are moderately to somewhat rapidly absorptive.

Appendix II: Photographs and Photomicrographs

Microscopic examination is performed on an Olympus BX-51 polarized/reflected light microscope and a Bausch and Lomb Stereozoom 7 stereoscopic reflected light microscope. Both microscopes are fitted with an Olympus DP-11 digital camera. The overlays presented in the photomicrographs (e.g., text, scale bars, and arrows) are prepared as layers in Adobe Photoshop and converted to the jpeg format. Digital processing is limited to those functions normally performed during standard print photography processing. Photographs intended to be visually compared are taken under the same exposure conditions whenever possible.

The following abbreviations may be found in the figure captions and overlays and these are defined as follows:

cm	centimeters	PPL	Plane polarized light
mm	millimeters	XPL	Crossed polarized light
μm	microns (1 micron = 1/1000 millimeter)		
mil	1/1000 inch		

Microscopical images are often confusing and non-intuitive to those not accustomed to the techniques employed. The following is offered as a brief explanation of the various views encountered in order that the reader may gain a better appreciation of what is being described.

Reflected light images: These are simply magnified images of the surface as would be observed by the human eye. A variety of surface preparations may be employed including polished and fractured surfaces. The reader should note the included scale bars as minor deficiencies may seem much more significant when magnified.

Plane polarized light images (PPL): This imaging technique is most often employed in order to discern textural relationships and microstructure. To employ this technique, samples are milled (anywhere from 20 to 30 microns depending on the purpose) so as to allow light to be transmitted through the material. In many cases, Highbridge also employs a technique whereby the material is impregnated with a low viscosity, blue-dyed epoxy. Anything appearing blue therefore represents some type of void space (e.g.; air voids, capillary pores, open cracks, etc.) Hydrated cement paste typically appears a light shade of brown in this view (with a blue hue when impregnated with the epoxy). With some exceptions, most aggregate materials are very light colored if not altogether white. Some particles will appear to stand out in higher relief than others. This is a function of the refractive power of different materials with respect to the mounting epoxy.

Crossed polarized light images (XPL): This imaging technique is most often employed to distinguish components or highlight textural relationships between certain components not easily distinguished in plane polarized light. Using the same thin sections, this technique places the sample between two pieces of polarizing film in order to determine the crystal structure of the materials under consideration. Isotropic materials (e.g.; hydrated cement paste, pozzolans and other glasses, many oxides, etc.) will not transmit light under crossed polars and therefore appear black. Non-isotropic crystals (e.g.; residual cement, calcium hydroxide, calcium carbonate, and most aggregate minerals) will appear colored. The colors are a function of the thickness, crystal structure, and orientation of the mineral. Many minerals will exhibit a range of colors due to their orientation in the section. For example, quartz sand in the aggregate will appear black to white and every shade of gray in between. Color difference does not necessarily indicate a material difference. When no other prompt is given in the figure caption, the reader should appeal to general shapes and morphological characteristics when considering the components being illustrated.

Chemical treatments: Many chemical techniques (etches and stains typically) are used to isolate and enhance a variety of materials and structures. These techniques will often produce strongly colored images that distinguish components or chemical conditions.

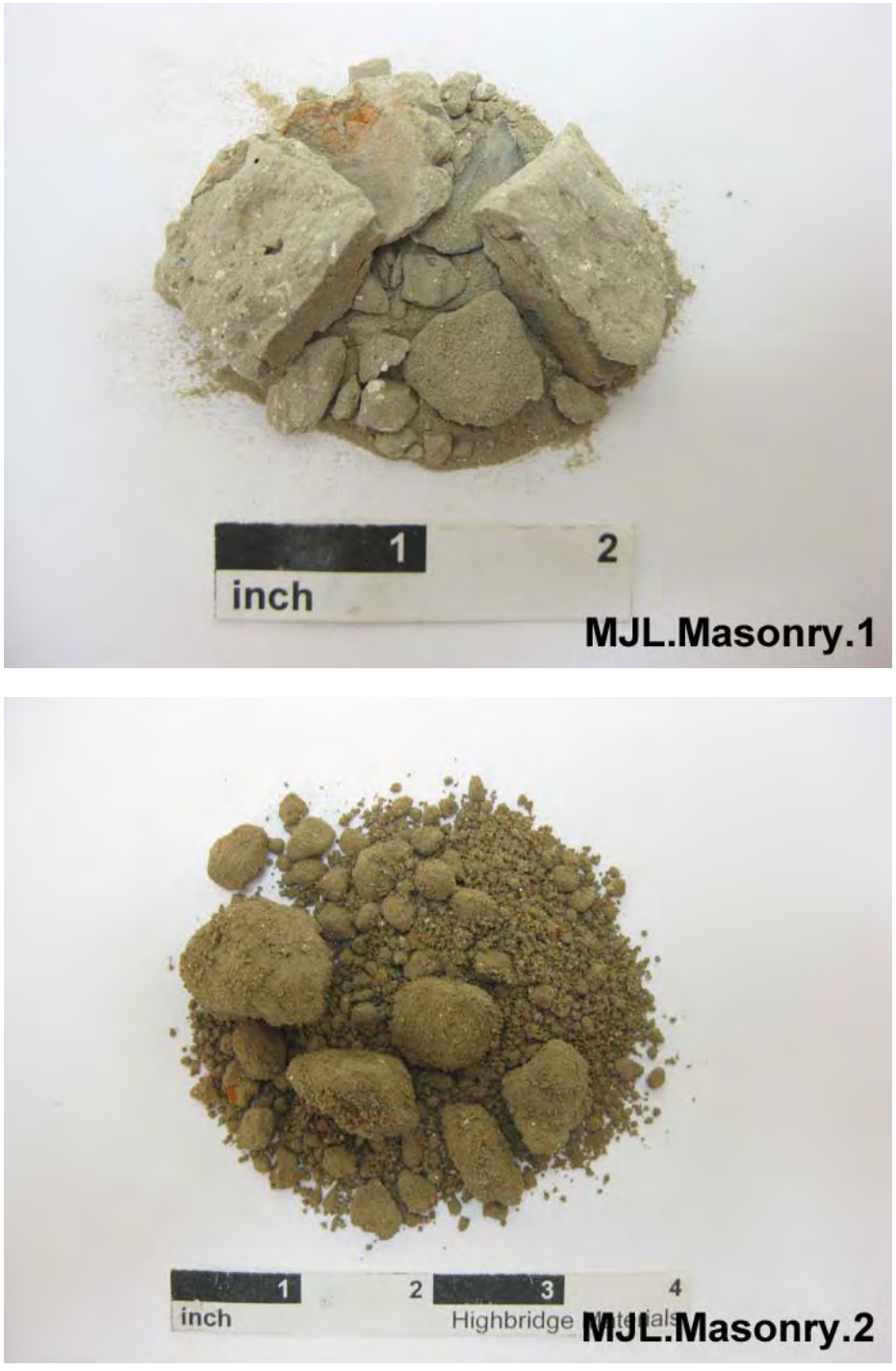


Figure 1: Photographs of the two mortar samples as received by Highbridge for examination. Both are uniform in appearance. Sample 1 is light tan and Sample 2 is medium brown. Both samples are relatively soft and absorptive.

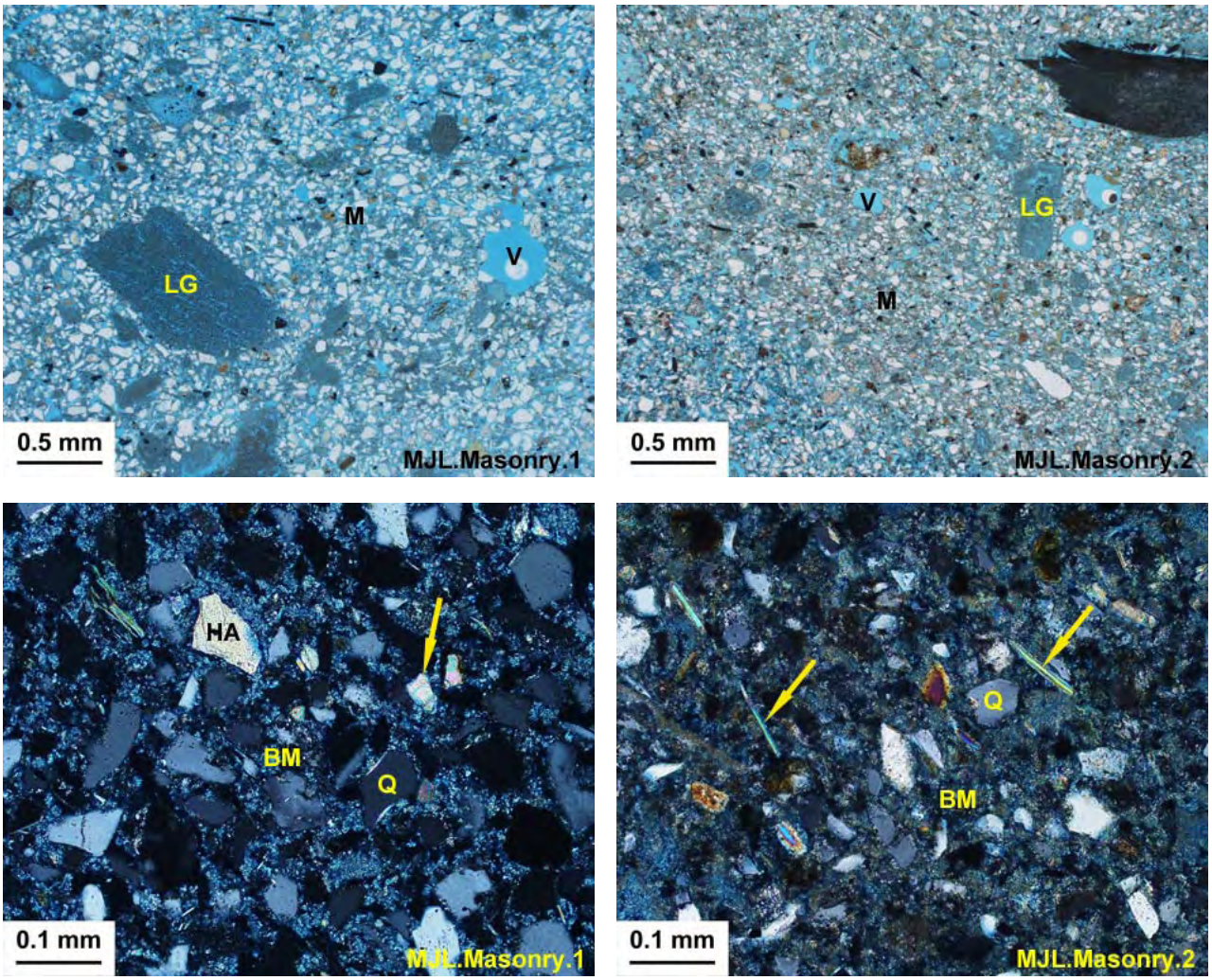


Figure 2: (Upper images) PPL photomicrographs illustrating the overall microtexture of the mortar samples. The samples are impregnated with a low-viscosity, blue-dyed epoxy in order to highlight cracks, pores, and voids. The matrix (M) consists of a fine silty clay. The silt grains appear as the fine white particles. Note that the silt in Sample 2 is slightly finer-grained than the silt in Sample 1. The matrix has a high capillary porosity as indicated by the absorption of blue-dyed epoxy. Undispersed lime grains (LG) are present but not overly coarse-grained. The mortars are well consolidated and air-voids (V) are minimal. (Lower images) XPL photomicrographs illustrating the silt components and matrix. Most of the silt consists of quartz. Trace heavy accessory minerals are present (HA shown for Sample 1). The arrows in Sample 2 illustrate fine mica flakes. The arrow in Sample 1 indicates very fine-grained carbonate interpreted to represent minor unburned constituents of the lime. The binder matrix in both samples (BM) is brightly colored under crossed polars indicating that both are fully carbonated.

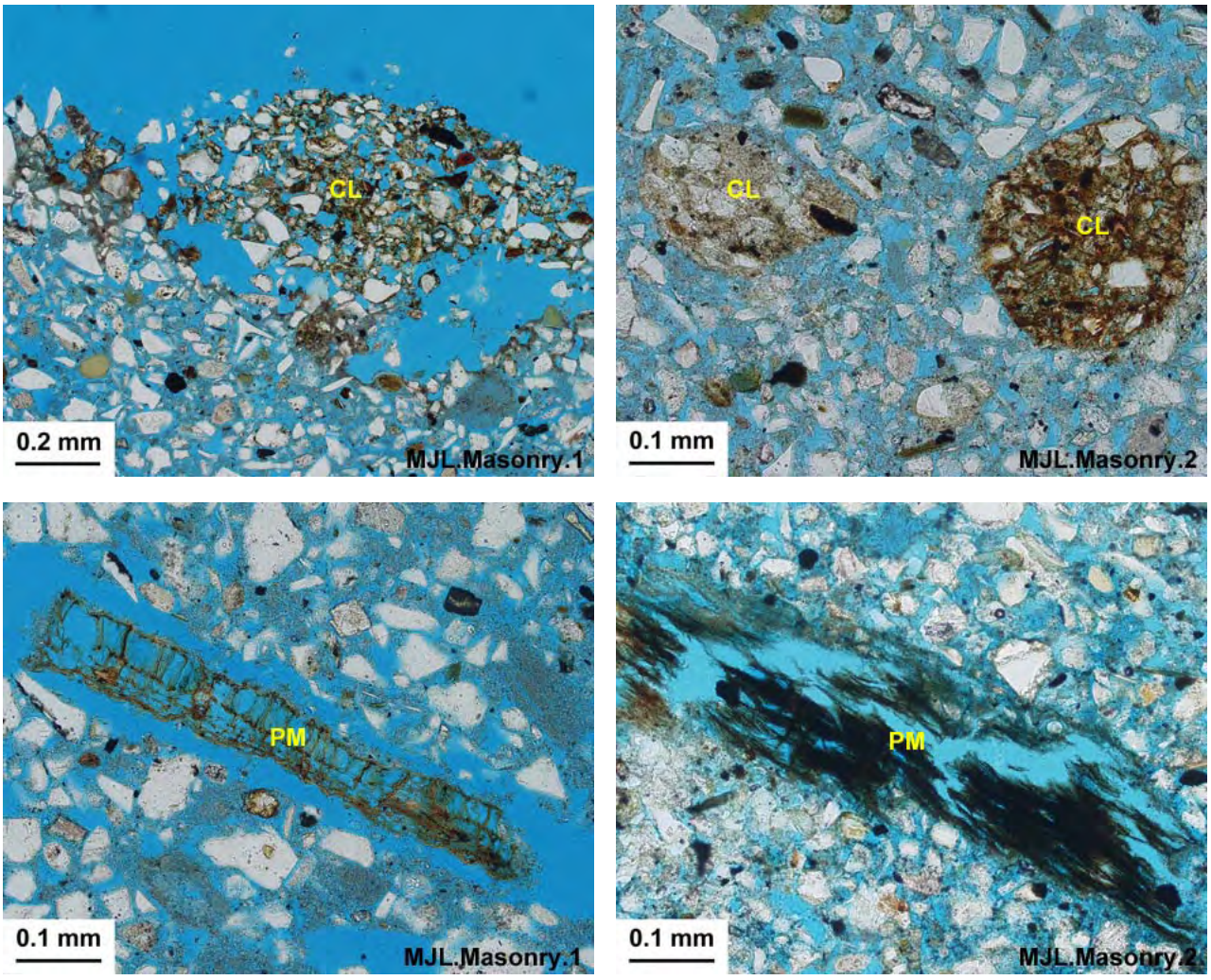


Figure 3: PPL photomicrographs illustrating components of the clay in the mortar samples. (Upper images) Unbroken silty clay lumps (CL) are not particularly abundant in either sample. Thin streaks are found along a few sample edges in Sample 1. Finer, rounded lumps are found as a minor component of Sample 2. (Lower images) Plant matter (PM) is a minor to trace component of both samples. These were likely a part of the clay addition.

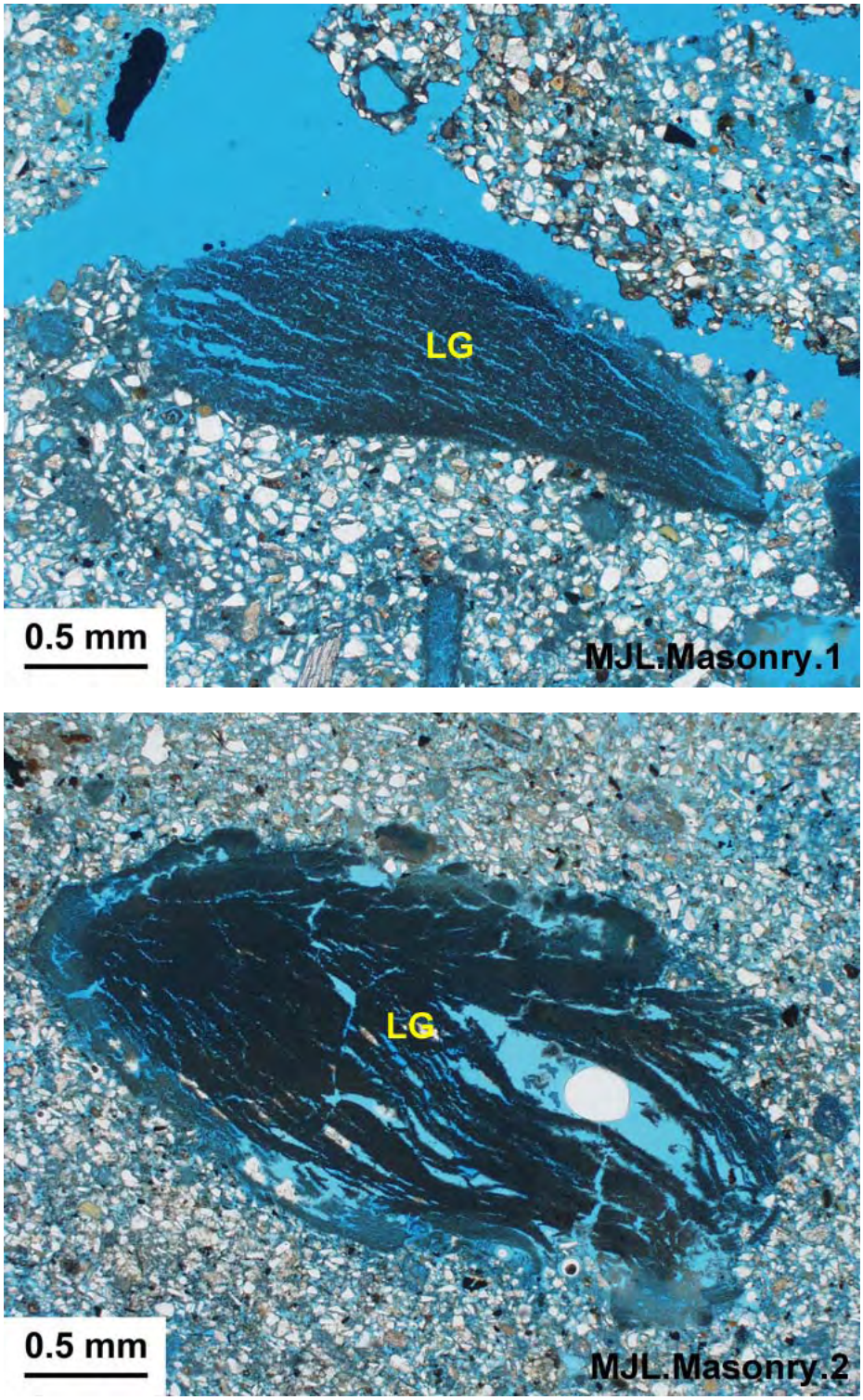


Figure 4: PPL photomicrographs illustrating the characteristics of undispersed lime grains (LG) in both mortar samples. Note the internal fractures that have a wavy, laminated distribution. These mirror original crystal textures in oyster shell. Fine-grained, undispersed lime particles are not uncommon but the lime is otherwise well blended with the clay binder.

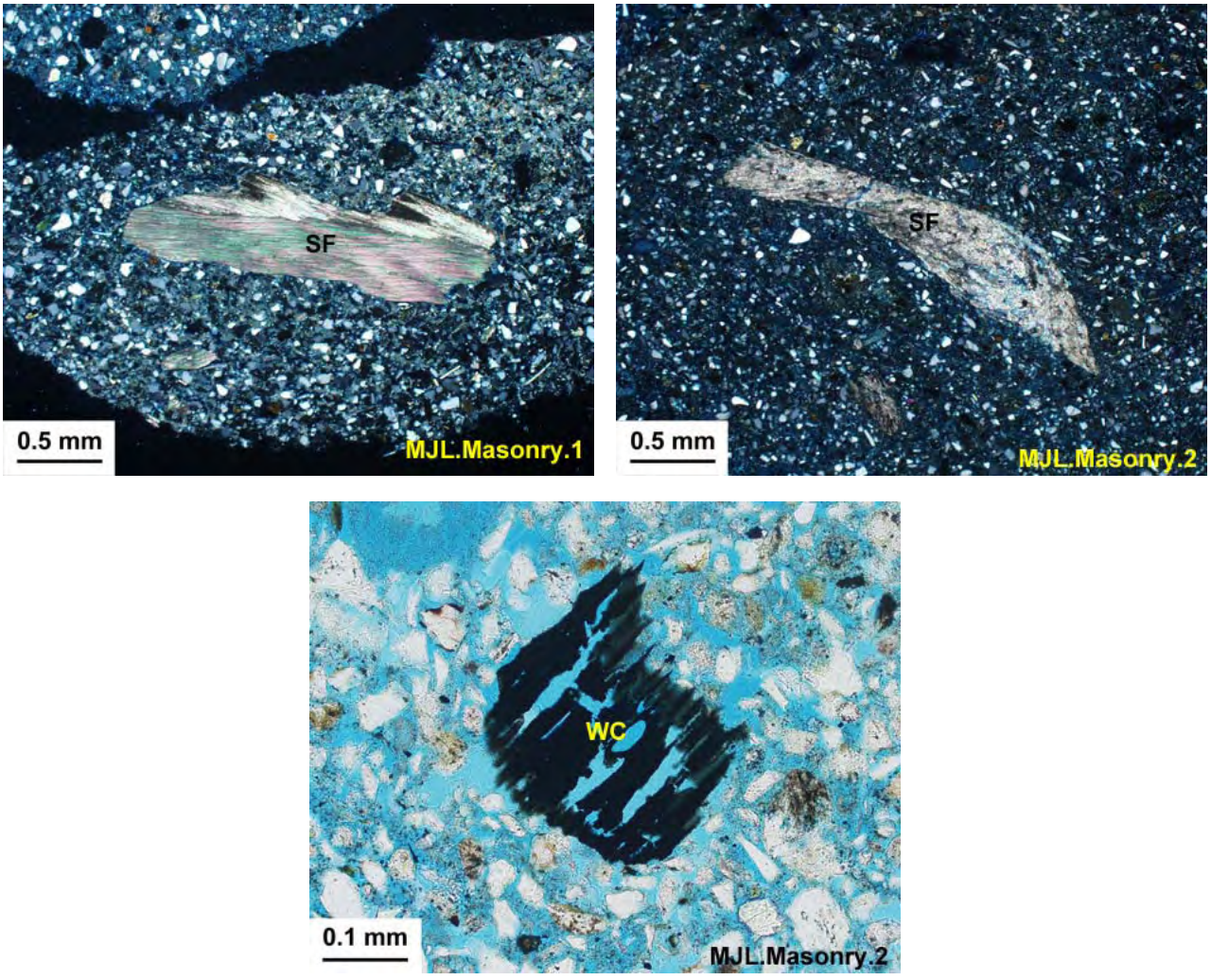


Figure 5: Photomicrographs illustrating residues of the lime calcination in the mortar samples. Small unburned shell fragments (SF) are shown in the upper XPL images. These are not abundant and the lime was well-fired. A small fragment of wood cinder (WC) is shown in the lower PPL photomicrograph. These likely represent fuel used to calcine the lime. They are only found in Sample 2.

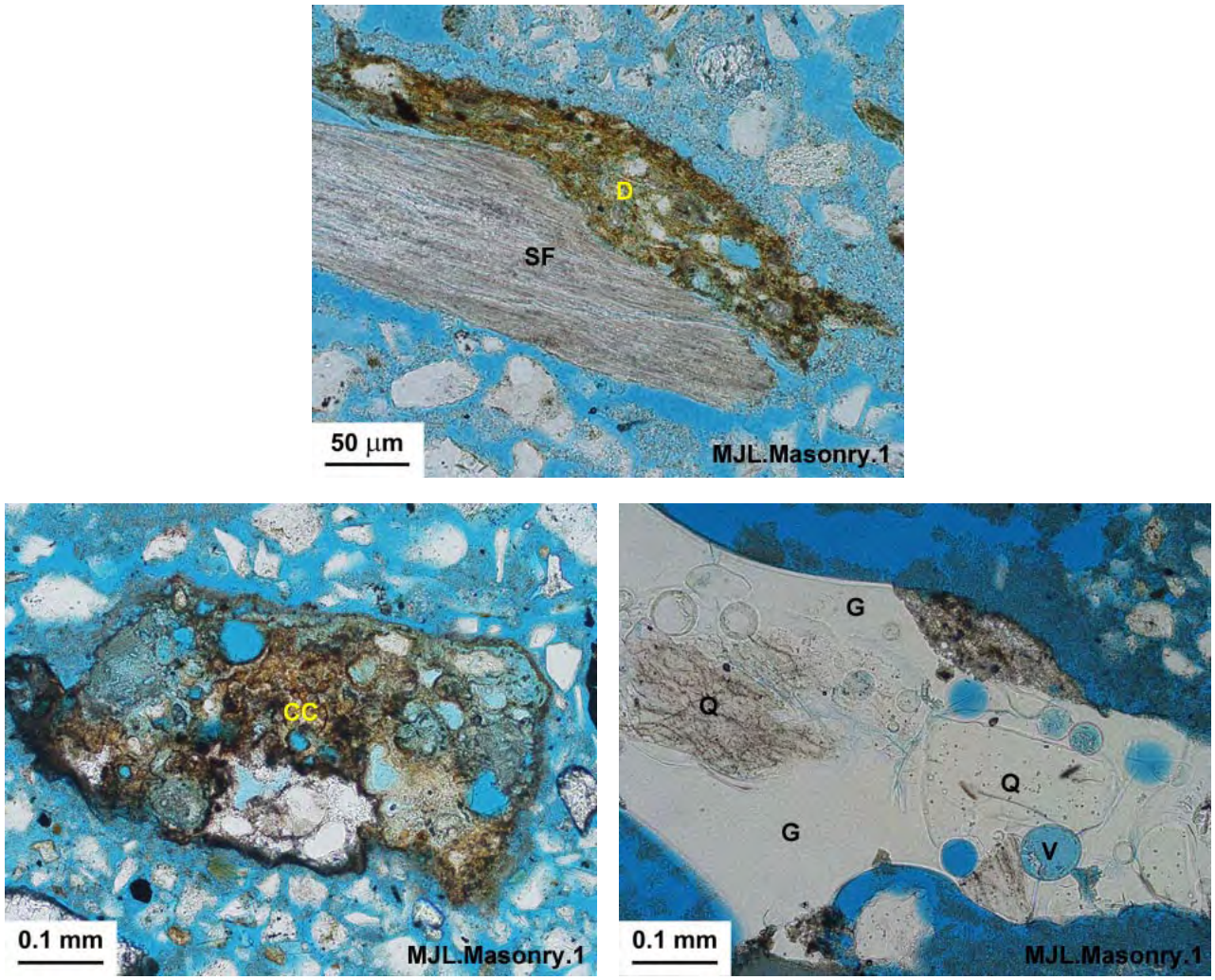


Figure 6: PPL photomicrographs of Sample S1. (Upper image) An unburned shell fragment (SF) has a thin residue of clay-rich debris (D). (Lower left image) Traces of calcined clay (CC) distributed throughout the mortar have derived from the firing of this unwashed debris along with the shells. (Lower right image) Siltier debris from the shells have burned to form a siliceous glass (G). This particular fragment contains cores of unburned quartz (Q) and spherical vesicles (V).

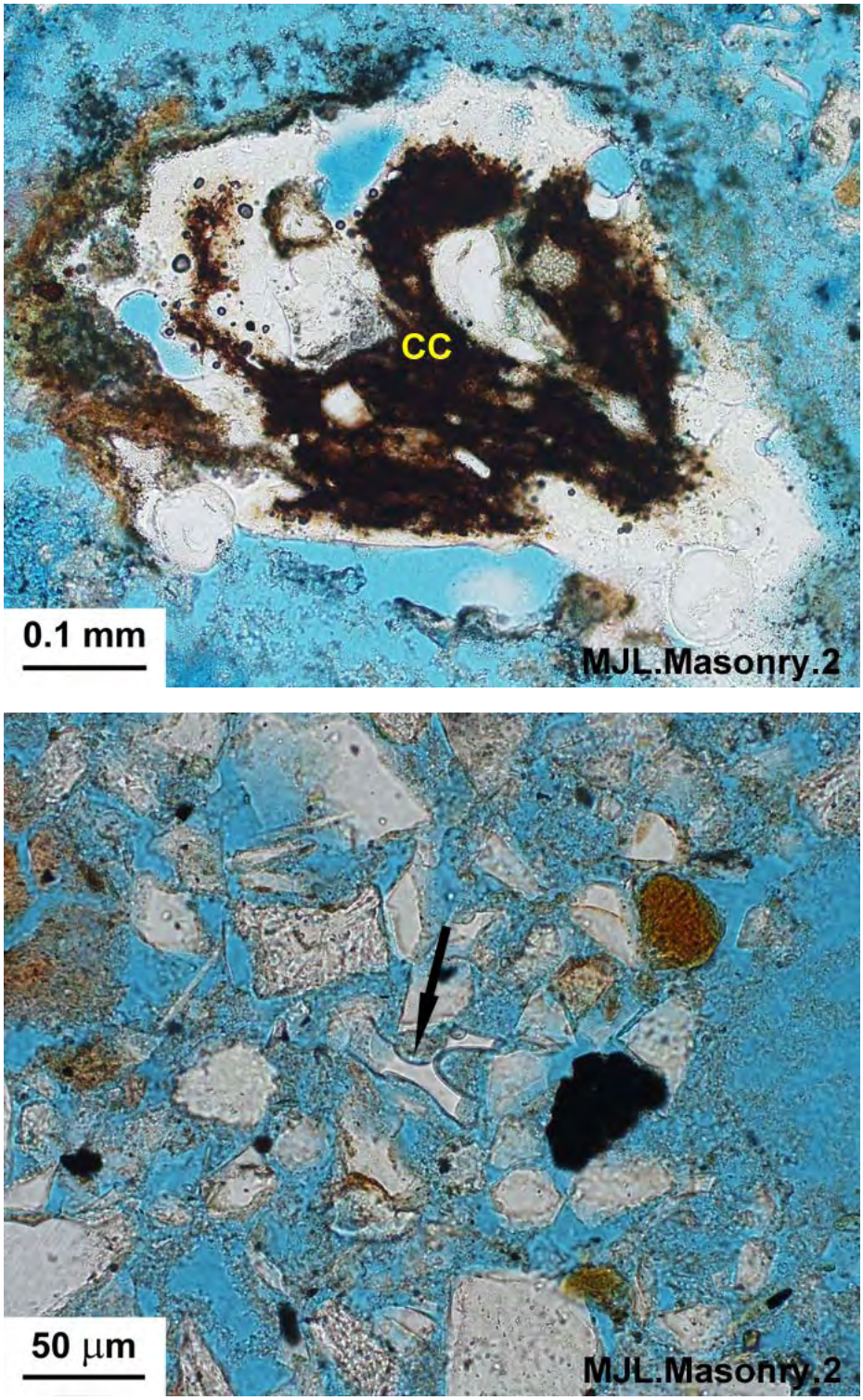


Figure 7: PPL photomicrographs of Sample S2. (Upper image) Calcined clay (CC) is also found in Sample 2. (Lower image) The arrow indicates a very fine glass shard. These are only found as trace contaminants in Sample 2. Again, they are considered to represent burned impurities adhered to the oyster shell before calcination.

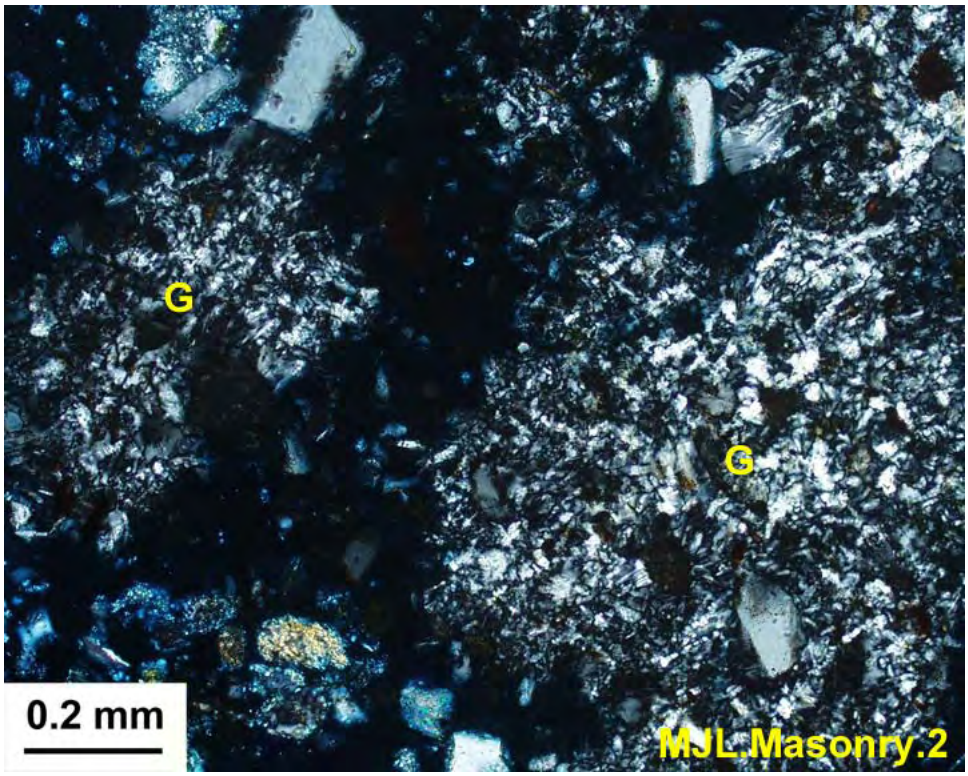


Figure 8: XPL photomicrograph illustrating fragments of gypsum clusters (G) found only in Sample 2. These probably indicate some sulfate deposition at the Sample 2 location. However, no gypsum is positively identified in the mortar pieces themselves.



Figure 9: Photographs of the stucco sample as received by Highbridge for examination. The material is uniform in appearance with a light brownish gray color. The stucco has a moderate hardness and is somewhat absorptive.

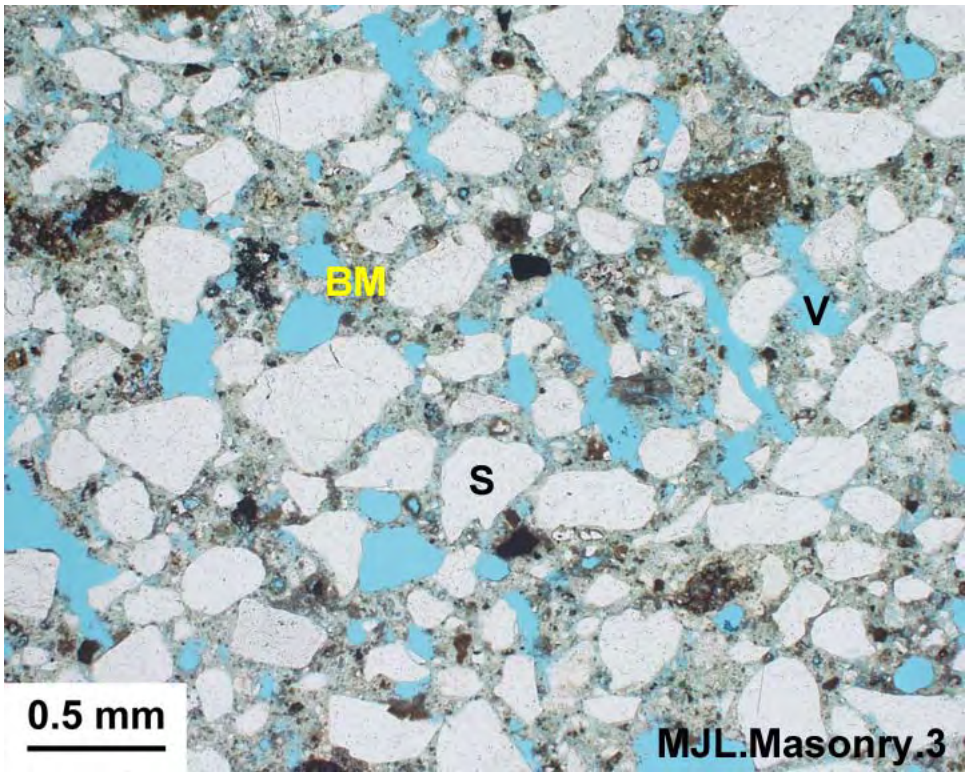


Figure 10: PPL photomicrograph illustrating the overall microstructure of the natural cement stucco sample. The sample is impregnated with a low-viscosity, blue-dyed epoxy in order to highlight cracks, pores, and voids. The binder matrix (BM) has a relatively high capillary porosity suggestive of a higher mix water content. The matrix is moderately permeable as a result. Sand grains (S) have a narrow particle size distribution often found in natural cement stuccoes and mortars. However, the grains are quite closely packed and the stucco is considered oversanded. Though moderately well consolidated, the higher sand content results in a higher content of air-voids (V).

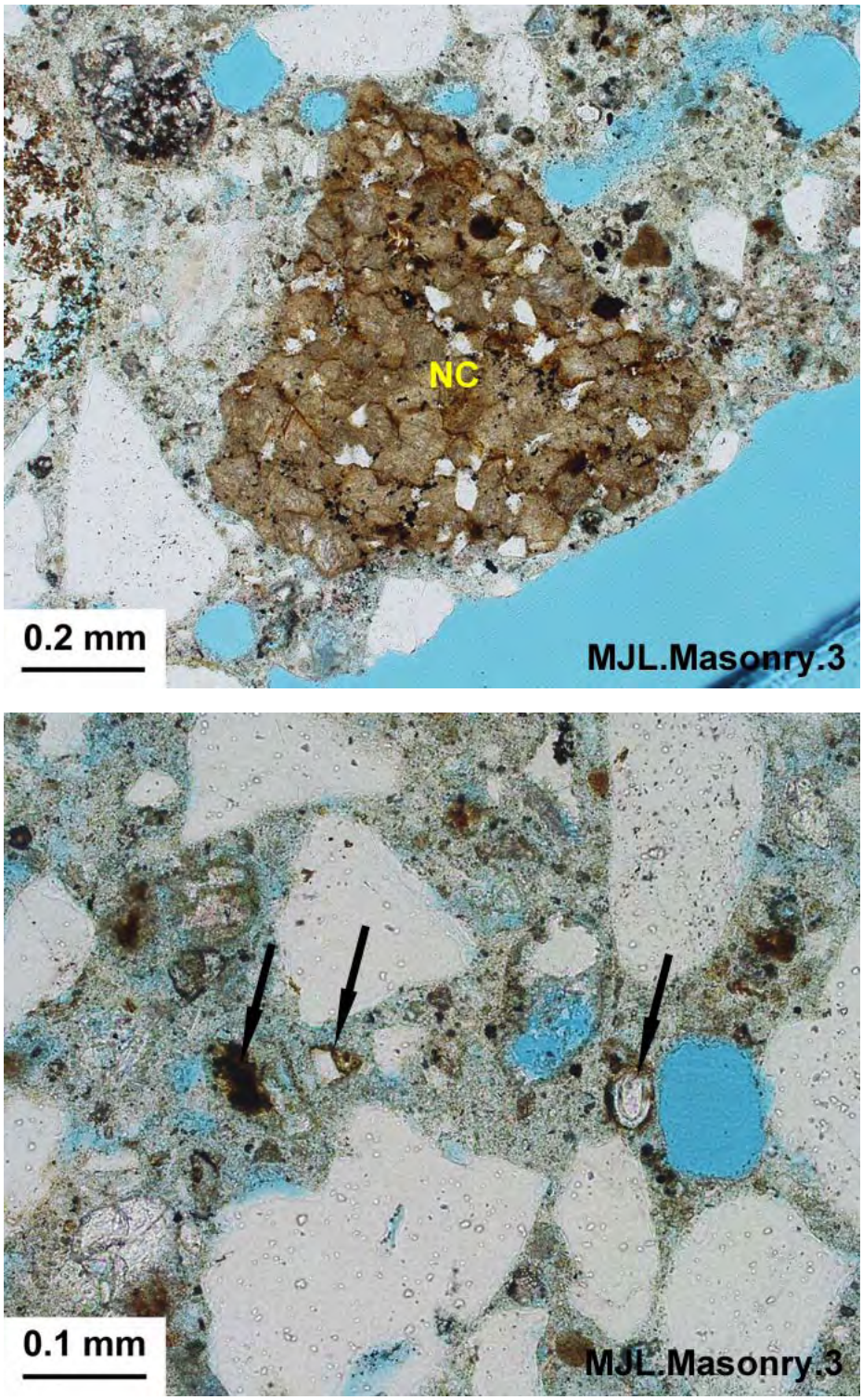


Figure 11: PPL photomicrograph illustrating the binder characteristics in the stucco sample. (Upper image) A larger natural cement residual (NC) contains an internal texture typical of the high-magnesium American cements. These include calcined dolomite crystals that are rhombic in shape and lined with a reddish iron product as well as fine, dispersed quartz silt appearing light-colored in this image. (Lower image) The arrows indicate fine, non-hydraulic "grit" representing the inert components of the natural cement. The particle shown at right is a quartz silt grain with a thin fusion rim.

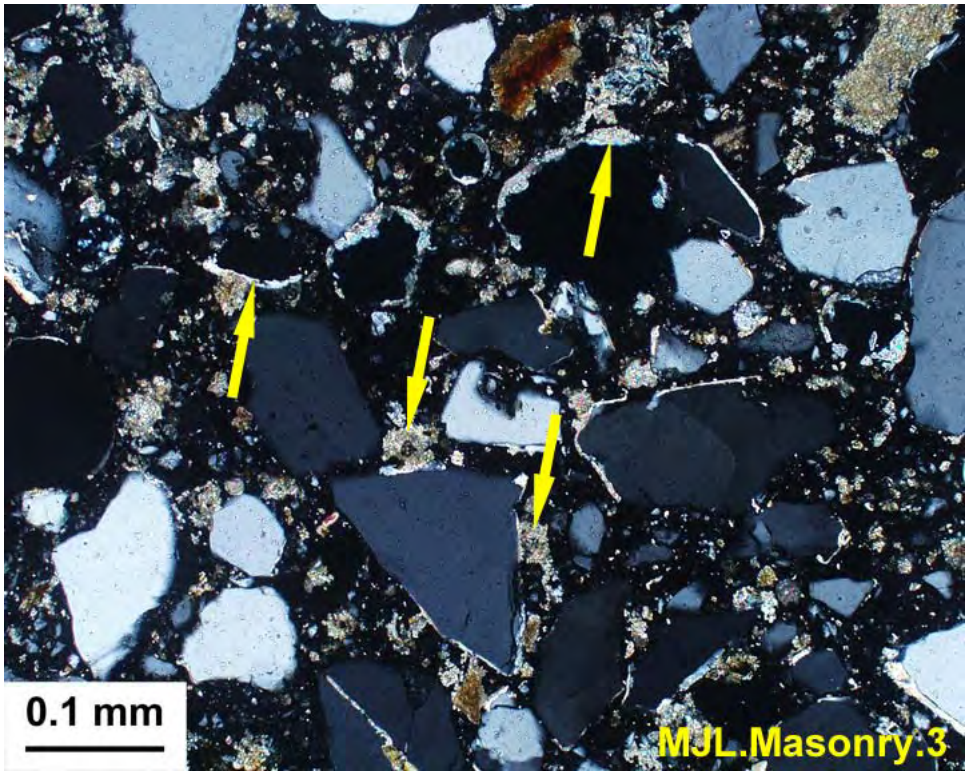


Figure 12: XPL photomicrograph illustrating secondary effects in the natural cement stucco. The arrows pointing downwards indicate coarser-grained carbonate crystals deposited from water infiltrating the stucco. The upward pointing arrows indicate fine microcracks at the paste-aggregate boundary healed with the same secondary carbonate.

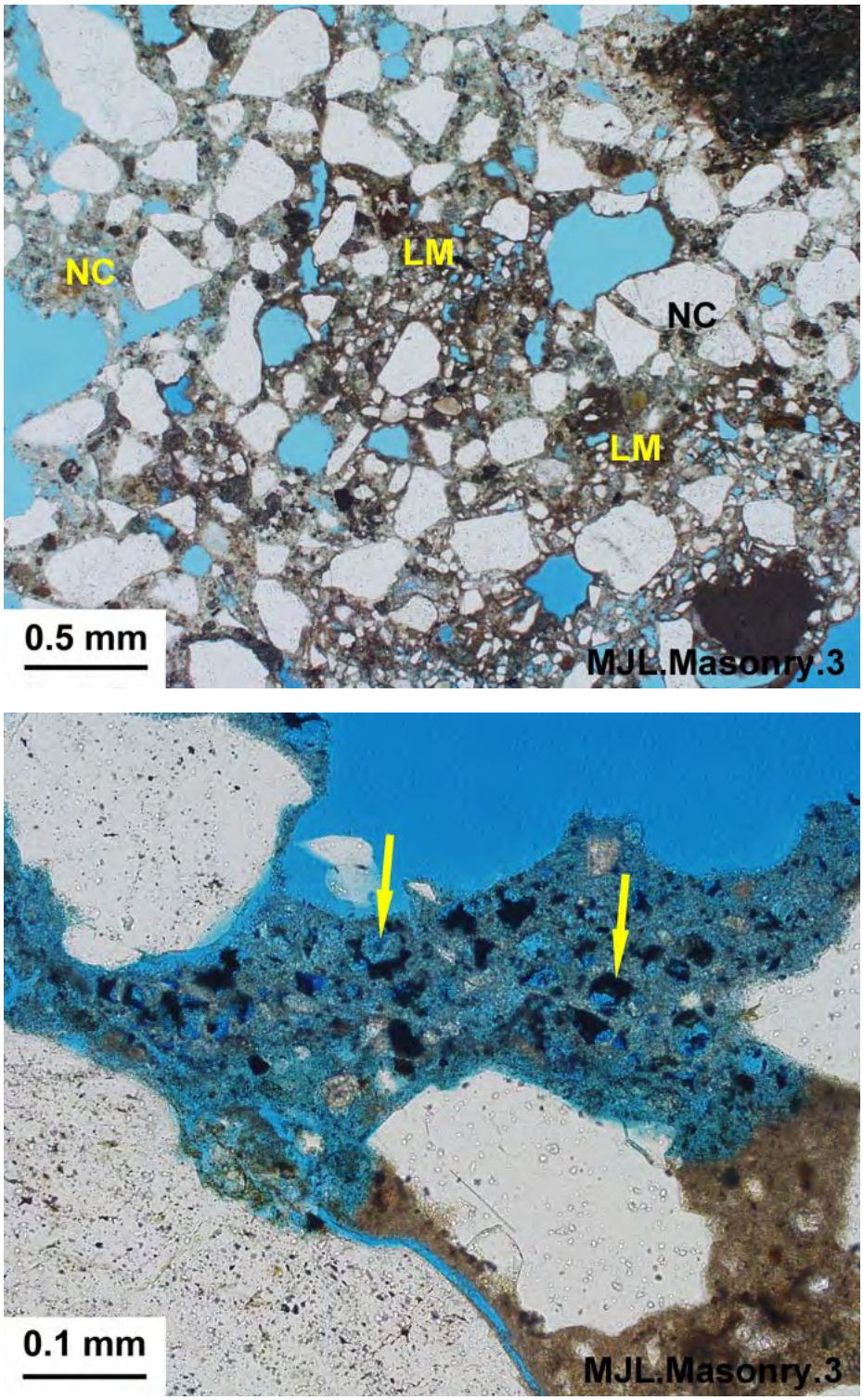


Figure 13: PPL photomicrographs depicting other materials found in association with Sample S3. (Upper image) A lime mortar (LM) with a fine, silty sand is detected as a residue at the underside of the natural cement stucco (NC). Note that the substrate mortar appears molded into the stucco. This could suggest a "wet-on-wet" boundary but this would not be consistent with a 1788 construction date. (Lower image) A thin, light-colored coating is found along the outer stucco surface. This is identified as a portland cement-based material. The arrows indicate well-hydrated gray portland cement grains.

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BRICK ANALYSIS REPORT

Client:	Building Conservation Associates, Inc.	**Client ID:**	BUIL005
Project:	Madame John's Legacy	**Report #:**	SL0534-02
Location:	New Orleans, LA	**Date Received:**	04/18/13
Sample Type:	Mortar, stucco, and brick	**Report Date:**	05/26/13
Delivered by:	Client (D. Krotzer)	**Petrographer:**	J. Walsh
		Page 1 of 10	

Report Summary

- Two brick samples from Madame John's Legacy in New Orleans, LA are examined petrographically for this report.
- Both contain the same materials including a single source of highly silty clay with no temper addition. Both are microstructurally uniform and both were well consolidated during forming. However, the clay is sparse and barely coats the closely packed silt grains resulting in a fine interconnected void structure and an overly permeable brick.
- The differing hardness noted in hand sample is likely attributed only to differences in firing temperature.
- No obvious distress is identified petrographically in either sample though both are considered highly susceptible to water infiltration and tensile failure due to salt hydration or crystallization.
- A more detailed discussion of these findings may be found in the "Petrographic Findings and Discussion" sections beginning on page 3 of this report.

1. Introduction

On April 18th, 2013, Highbridge received three mortar samples and two brick samples from Ms. Dorothy Krotzer of Building Conservation Associates, Inc. The samples are reported to have been taken from Madame John's Legacy in the French Quarter, New Orleans which dates from 1788. The client describes the structure as a residence in the French Colonial style with a raised brick masonry ground floor and a brick-between-post upper floor. The samples are identified by the client as follows.

MJL.Masonry.1:	Bedding/pointing mortar from the south brick chimney in attic (interior location). Date unknown, may be 1788.
MJL.Masonry.2:	Bedding/pointing mortar from ground floor level brick masonry, rear (southwest) elevation. Date unknown, may be 1788. [Note: sample was removed from a protected area in a closet in the restroom that appears not to have been re-pointed, although area has high amount of moisture and masonry is generally deteriorated]
MJL.Masonry.3:	Exterior stucco, northwest elevation, 14" from grade. Date unknown.
MJL.Masonry.4:	Brick from ground floor level brick masonry, rear (southwest) elevation, location "B". Date unknown, may be 1788. [Note: sample was removed from a protected area in a closet in the restroom, same as sample MJL.Masonry.2.]
MJL.Masonry.5:	Brick from ground floor level brick masonry, rear (southwest) elevation, location "C". Date unknown, may be 1788. [Note: sample was removed from a protected area in a closet in the restroom, same as sample MJL.Masonry.2.]

For the sake of brevity, Highbridge will refer to the samples as 1, 2, 3, 4, and 5 in this report. At the client's request, a petrographic examination of the brick samples is requested to identify constituent components as well as any signs of distress or other features that might affect durability. The results of these analyses are presented below. Petrographic examination of the mortar and stucco samples is reported under separate cover in Highbridge Report SL0534-01.

2. Methods of Examination

The petrographic examination is conducted in accordance with the standard practices contained within ASTM C856. Though written specifically for portland cement concrete, the methods are applicable to any material consisting wholly or in part of inorganic or crystalline materials. Data collection is performed by a degreed geologist who by nature of his/her education is qualified to operate the analytical equipment employed. Analysis and interpretation is performed or directed by a supervising petrographer who satisfies the qualifications as specified in Section 4 of ASTM C856.

3. Standard of Care

Highbridge has performed its services in conformance with the care and skill ordinarily exercised by reputable members of the profession practicing under similar conditions at the same time. No other warranty of any kind, expressed or implied, in fact or by law, is made or intended. Interpretations and results are based strictly on samples provided and/or examined.

4. Confidentiality

This report presents the results of laboratory testing requested by the client to satisfy specific project requirements. As such, the client has the right to use this report as necessary in any commercial matters related to the referenced project. Any reproduction of this report must be done in full. In offering a more thorough analysis, it may have been necessary for Highbridge to describe proprietary laboratory methodologies or present opinions, concepts, or original research that represent the intellectual property of Highbridge Materials Consulting and its successors. These intellectual property rights are not transferred in part or in full to any other party. Presentation of any or all of the data or interpretations for purposes other than those necessary to satisfy the goals of the investigation are not permitted without the express written consent of the author. The findings may not be used for purposes outside those originally intended. Unauthorized uses include but are not limited to internet or electronic presentation for marketing purposes, presentation of findings at professional venues, or submission of scholarly articles.

5. Petrographic Findings and Discussion

5.1 - General Summary

Two brick samples are examined petrographically. Both contain the same materials including a single source of highly silty clay with no temper addition. Both are microstructurally uniform and both were well consolidated during forming. However, the clay is sparse and barely coats the closely packed silt grains resulting in a fine interconnected void structure and an overly permeable brick. The differing hardness noted in hand sample is likely attributed only to differences in firing temperature. No obvious distress is identified petrographically in either sample though both are considered highly susceptible to water infiltration and tensile failure due to salt hydration or crystallization.

5.2 - Visual Appearance

Sample 4 is provided as two small pieces weighing a total of 80.4 grams. The material is homogeneous in appearance with a red color (Munsell color code approximately 2.5YR 4.75/7). Trace black spots are found in the matrix at no more than one millimeter in diameter. There is a moderately low content of deformed rounded voids up to a few millimeters in length. The brick matrix is very soft and fine, silty material is easily dislodged with light pressure. The matrix is exceptionally water absorptive. No cracks or salt deposits are visible in hand sample.

Sample 5 is provided as one cubic-shaped piece weighing 88.9 grams. The material is mostly homogeneous though faintly mottled with an average yellowish red color (Munsell color code approximately 5YR 4.75/6). The same trace black spots found in Sample 4 are also identified in this sample. There is a low abundance of deformed voids most less than two millimeters in length. The brick matrix is moderately hard but still exceptionally absorptive. No cracks or salt deposits are visible in hand sample.

5.3 - Materials

Both brick samples contain the same matrix characterized by a fired silty clay with no temper addition. The silt content is rich in both samples and the particles are quite densely packed within the fired matrix. Point contacts are common between adjacent silt grains. The material consists predominantly of quartz with minor feldspar, chert/chalcedony, and biotite mica. Traces include white mica and heavy accessory minerals. Iron-oxide granules up to 100 μm in size are relatively common in both samples. The maximum grain size is found at about the No. 100 sieve though most particles are estimated to pass the No. 200 sieve. Silt grains are mostly angular and equidimensional in shape though some shard-like quartz particles are present. No significant thermal cracking or fusion rims are found in the fine silt though this is not unusual given the fine grain size. The silt distribution is very uniform in both samples with no layering, streaking, or other heterogeneities.

The clay matrix is quite sparse in both samples and in most cases just barely coats and binds the silt particles. Fine-grained lumps of silty clay with a denser clay matrix are found in both samples in very low abundance. The fine lumps are rounded and generally less than one millimeter in diameter. These are interpreted to be responsible for the fine but visible black spots in the brick matrix. Elsewhere, the clay matrix is too fine to resolve microscopically and appears as an amorphous and mostly isotropic material with very fine-grained iron-rich particulates. No mullite or other high temperature aluminates are positively identified at the scale of the polarized light microscope. In Sample 4, exceptionally fine-grained carbonate particles are found disseminated throughout the fired clay. These are not observed in Sample 5 and instead, there is a trace abundance of extremely fine-grained birefringent clay.

The pore structure of both brick samples is influenced by the low ratio of clay to silt in the original source material. The clay does not fully encase the closely packed silt particles and this leaves interstitial pores that form an interconnected network throughout the entire clay body. The pore sizes are controlled by the silt size and are generally measured in the tens of microns. Though absorption and capillarity rates are not determined for either brick, both are found qualitatively to be exceptionally absorptive despite apparent differences in matrix hardness. This similarly high permeability is attributed to the interconnected pore structure. Not identified in either sample are lenticular pores or other openings caused by shrinkage or volume changes during firing. Minor pore spaces due to the original clay consolidation are found as relatively isolated voids a few millimeters in dimension. These are observed visually in both samples but are only detected petrographically in Sample 5. These voids are inconsequential and the consolidation of the clay during molding was well executed for both bricks.

5.4 - Condition and Service Performance
The two brick samples are interpreted to represent the same source material with differences in hardness and cohesion attributed solely to firing temperature. There is no definitive evidence found petrographically to support this but the hand sample properties are consistent with the interpretation. Both are considered to be low-fired brick though Sample 5 represents a higher temperature product with a more indurate matrix.

It is understood that significant masonry deterioration is observed on site. However, the two brick samples provided for examination are in relatively sound condition. No microcracks or secondary salt deposits are detected petrographically. Nonetheless, the brick is considered overly permeable and subject to water infiltration and diffusion of salts. The weakly bonded silt grains with low clay content are not expected to resist tensile stresses such as those produced by salt hydration or crystallization.

Respectfully submitted,

John J. Walsh
President/ Senior Petrographer
Highbridge Materials Consulting, Inc.

Appendix I: Photographs and Photomicrographs

Microscopic examination is performed on an Olympus BX-51 polarized/reflected light microscope and a Bausch and Lomb Stereozoom 7 stereoscopic reflected light microscope. Both microscopes are fitted with an Olympus DP-11 digital camera. The overlays presented in the photomicrographs (e.g., text, scale bars, and arrows) are prepared as layers in Adobe Photoshop and converted to the jpeg format. Digital processing is limited to those functions normally performed during standard print photography processing. Photographs intended to be visually compared are taken under the same exposure conditions whenever possible.

The following abbreviations may be found in the figure captions and overlays and these are defined as follows:

cm	centimeters	PPL	Plane polarized light
mm	millimeters	XPL	Crossed polarized light
μm	microns (1 micron = 1/1000 millimeter)		
mil	1/1000 inch		

Microscopical images are often confusing and non-intuitive to those not accustomed to the techniques employed. The following is offered as a brief explanation of the various views encountered in order that the reader may gain a better appreciation of what is being described.

Reflected light images: These are simply magnified images of the surface as would be observed by the human eye. A variety of surface preparations may be employed including polished and fractured surfaces. The reader should note the included scale bars as minor deficiencies may seem much more significant when magnified.

Plane polarized light images (PPL): This imaging technique is most often employed in order to discern textural relationships and microstructure. To employ this technique, samples are milled (anywhere from 20 to 30 microns depending on the purpose) so as to allow light to be transmitted through the material. In many cases, Highbridge also employs a technique whereby the material is impregnated with a low viscosity, blue-dyed epoxy. Anything appearing blue therefore represents some type of void space (e.g.; air voids, capillary pores, open cracks, etc.) Hydrated cement paste typically appears a light shade of brown in this view (with a blue hue when impregnated with the epoxy). With some exceptions, most aggregate materials are very light colored if not altogether white. Some particles will appear to stand out in higher relief than others. This is a function of the refractive power of different materials with respect to the mounting epoxy.

Crossed polarized light images (XPL): This imaging technique is most often employed to distinguish components or highlight textural relationships between certain components not easily distinguished in plane polarized light. Using the same thin sections, this technique places the sample between two pieces of polarizing film in order to determine the crystal structure of the materials under consideration. Isotropic materials (e.g.; hydrated cement paste, pozzolans and other glasses, many oxides, etc.) will not transmit light under crossed polars and therefore appear black. Non-isotropic crystals (e.g.; residual cement, calcium hydroxide, calcium carbonate, and most aggregate minerals) will appear colored. The colors are a function of the thickness, crystal structure, and orientation of the mineral. Many minerals will exhibit a range of colors due to their orientation in the section. For example, quartz sand in the aggregate will appear black to white and every shade of gray in between. Color difference does not necessarily indicate a material difference. When no other prompt is given in the figure caption, the reader should appeal to general shapes and morphological characteristics when considering the components being illustrated.

Chemical treatments: Many chemical techniques (etches and stains typically) are used to isolate and enhance a variety of materials and structures. These techniques will often produce strongly colored images that distinguish components or chemical conditions.



Figure 1: Photographs of the two brick samples received by Highbridge for petrographic examination.

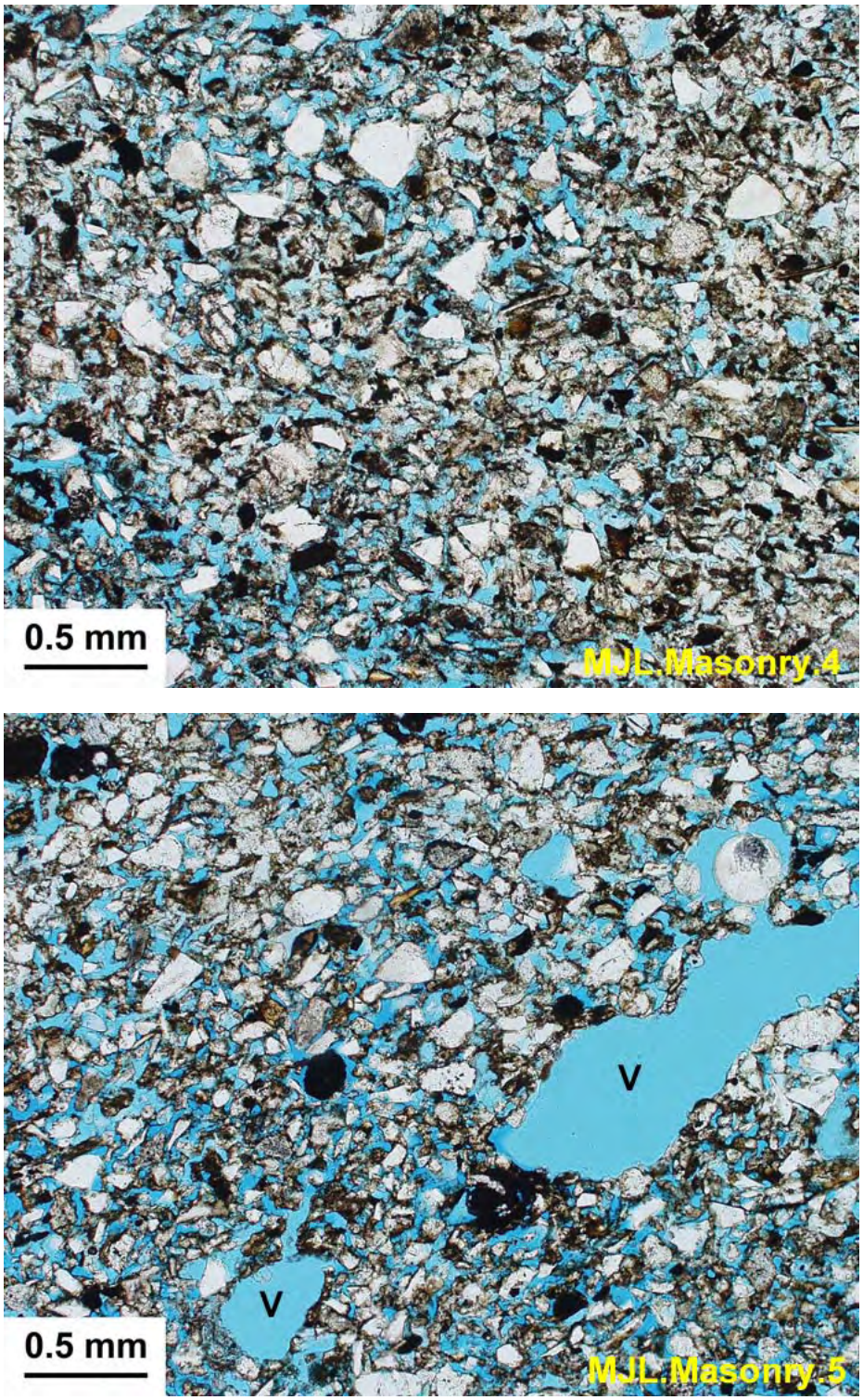


Figure 2: PPL photomicrographs illustrating the overall texture of the two brick samples. Both are impregnated with a low-viscosity, blue-dyed epoxy to highlight voids, pores, and cracks. Note the uniform distribution of fine silt appearing light-colored in both images. The two samples are interpreted to contain the same source of silty clay. The absorption of blue-dyed absorption in both images indicates a high permeability. Coarser consolidation voids (V) are shown for Sample 5.

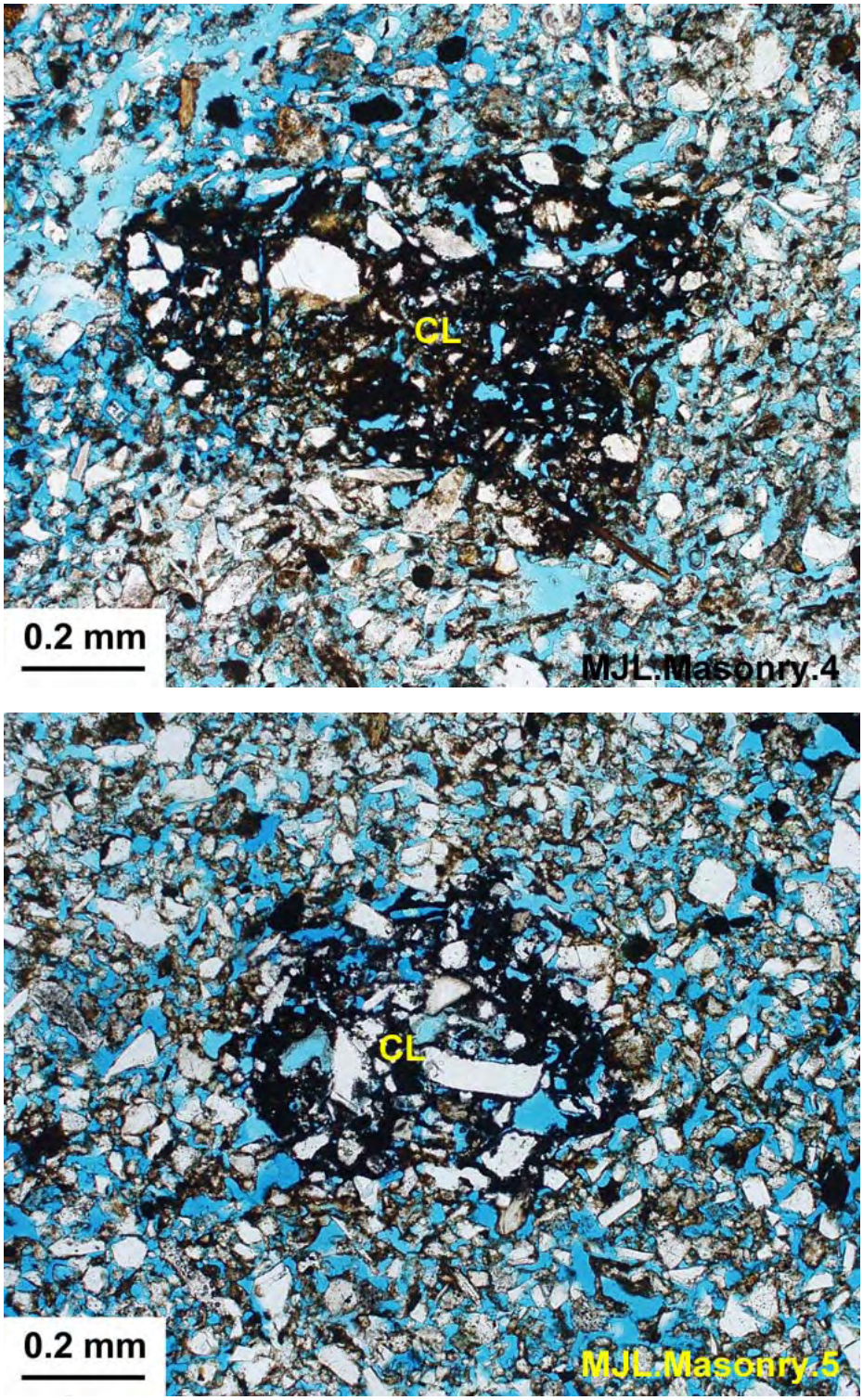


Figure 3: PPL photomicrographs. Fine, rounded clay lumps (CL) are present in both samples in relatively low abundance. These represent the only notable heterogeneities in the two materials and are responsible for the fine dark spots visible in hand sample.

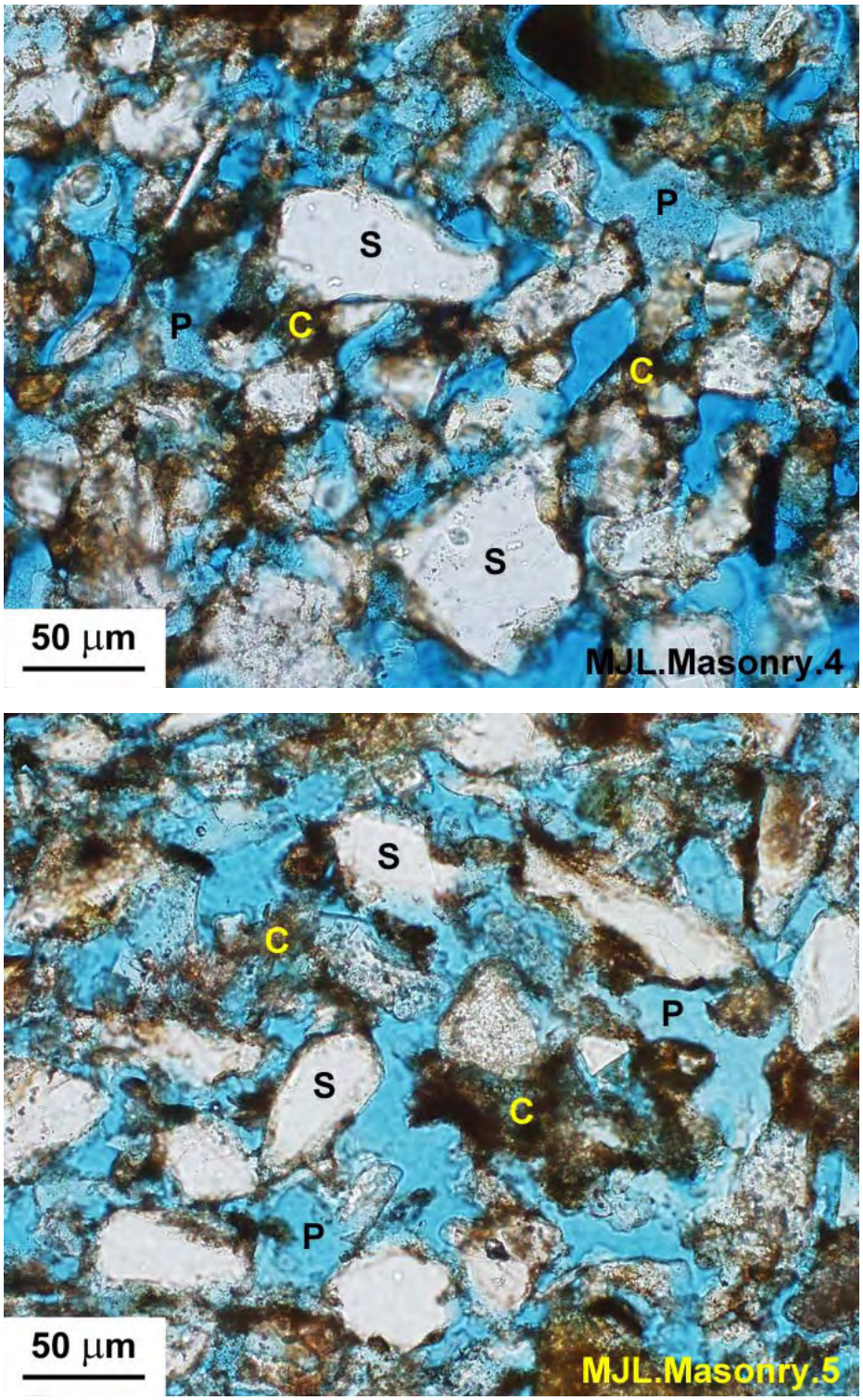


Figure 4: PPL photomicrographs illustrating the detailed microstructure of the brick samples. Silt grains (S) are angular, mostly equidimensional, and quite closely packed due to their high content in the clay source. No firing rims are detected along these quartz particles. The fired clay (C) barely coats the silt particles leaving much of the interstitial space unfilled. These unfilled pores (P) are ubiquitous and interconnected resulting in a high porosity and permeability.

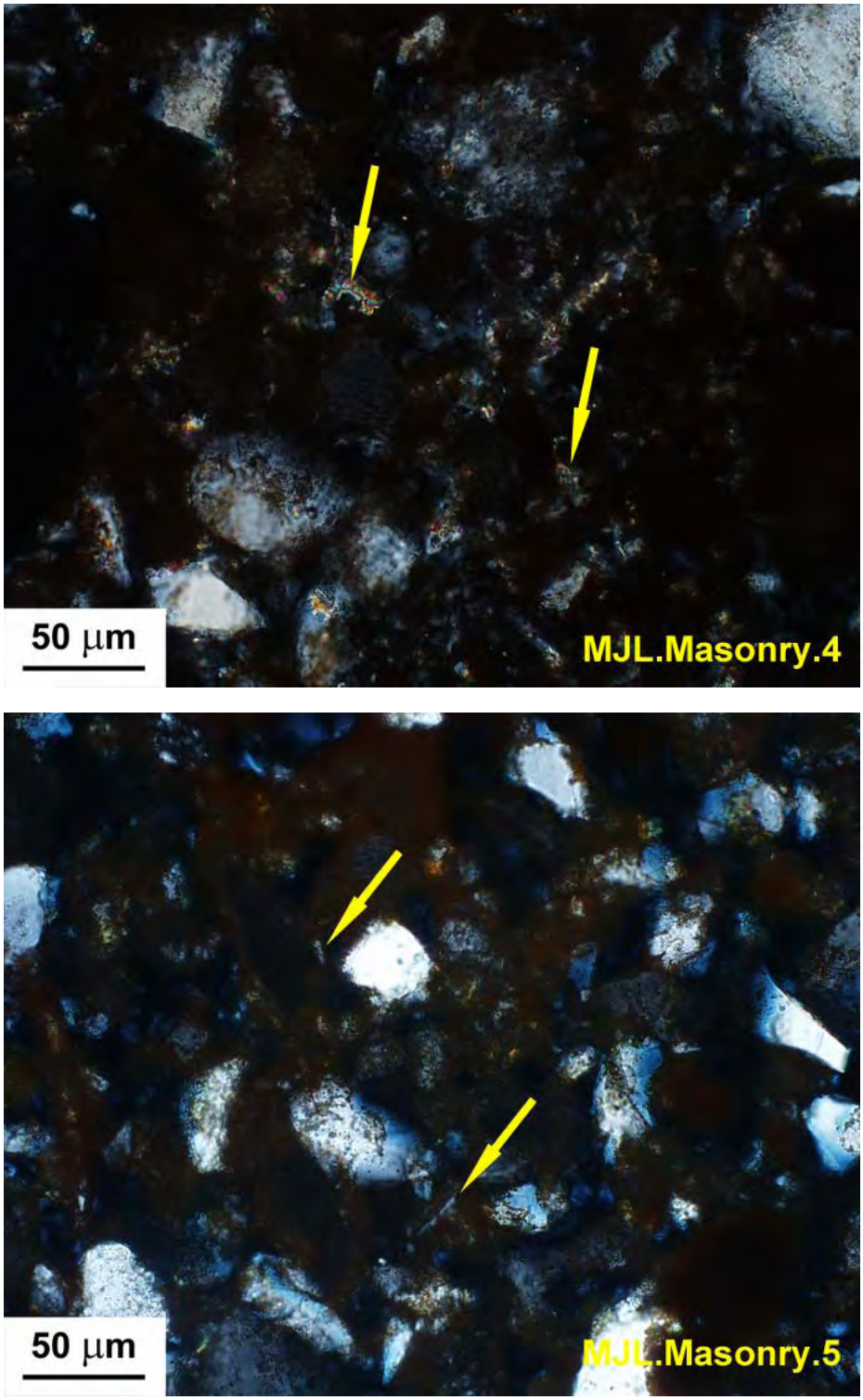


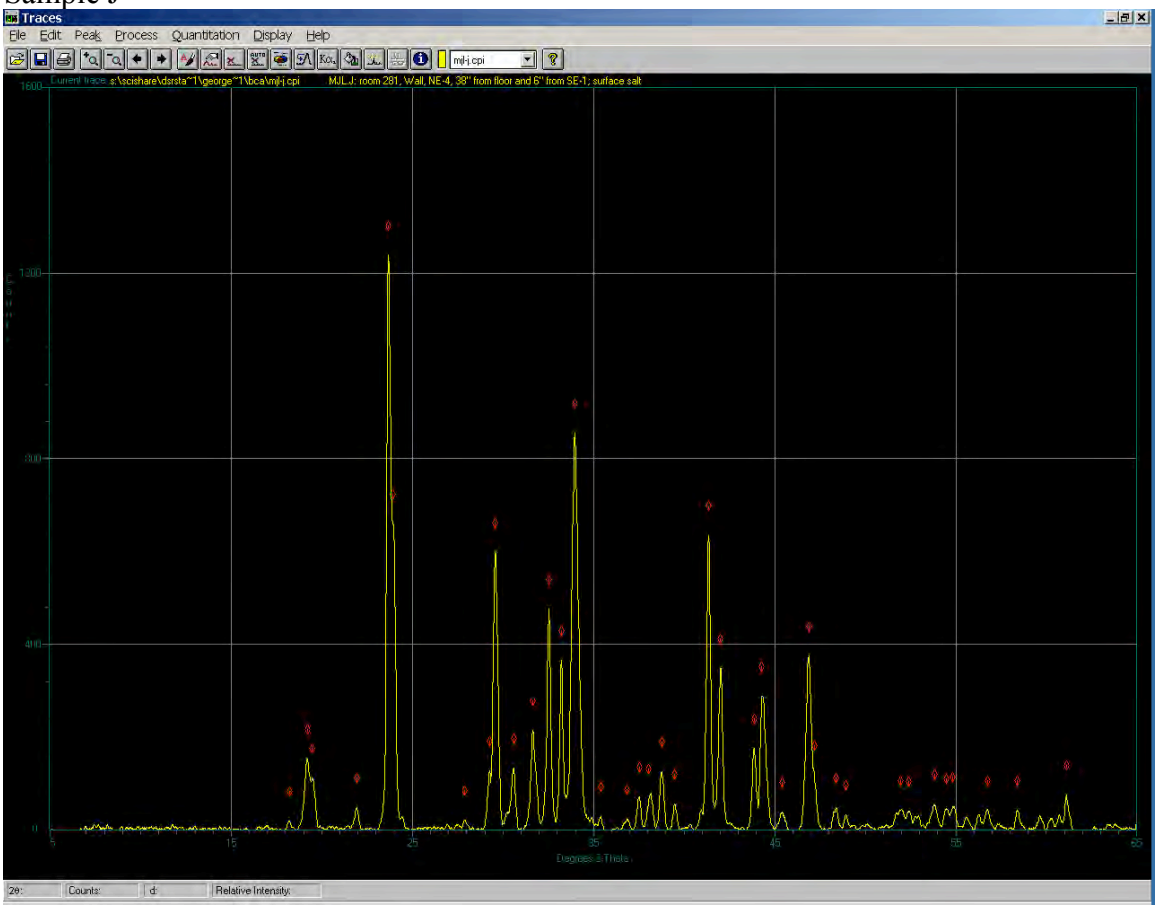
Figure 5: XPL photomicrographs illustrating minor differences in trace birefringent mineralogy in the clay body between samples. In Sample 4, the arrows indicate extremely fine grained carbonate crystals. These are absent in Sample 5. Instead, traces of birefringent clay are found (arrows).

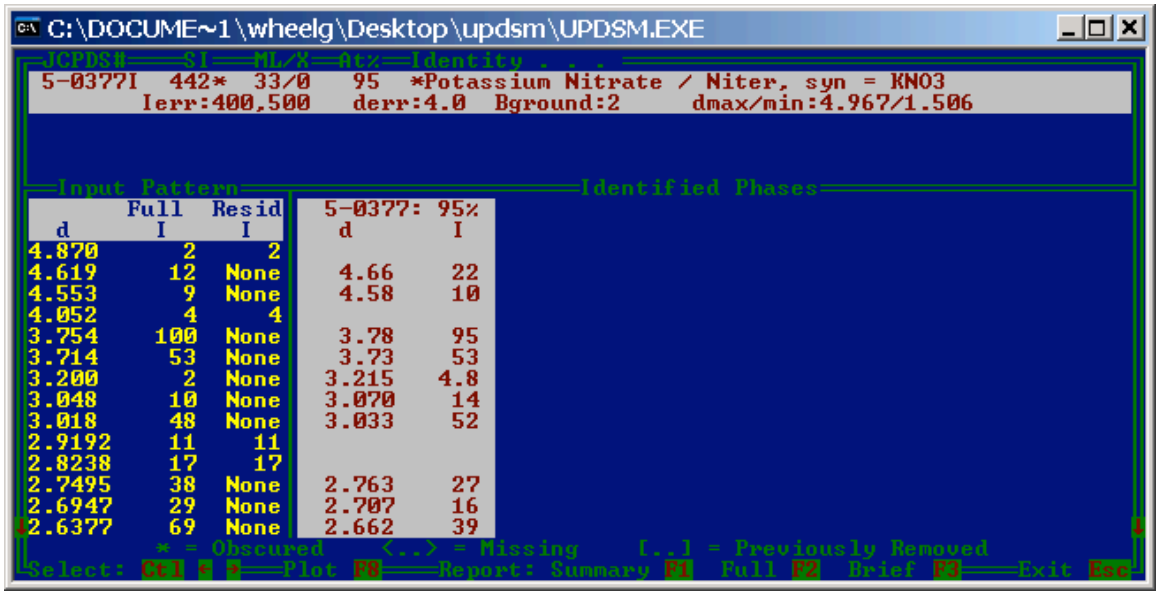
Appendix G.

X-Ray Diffraction (XRD) Spectral Data for Salt Analysis

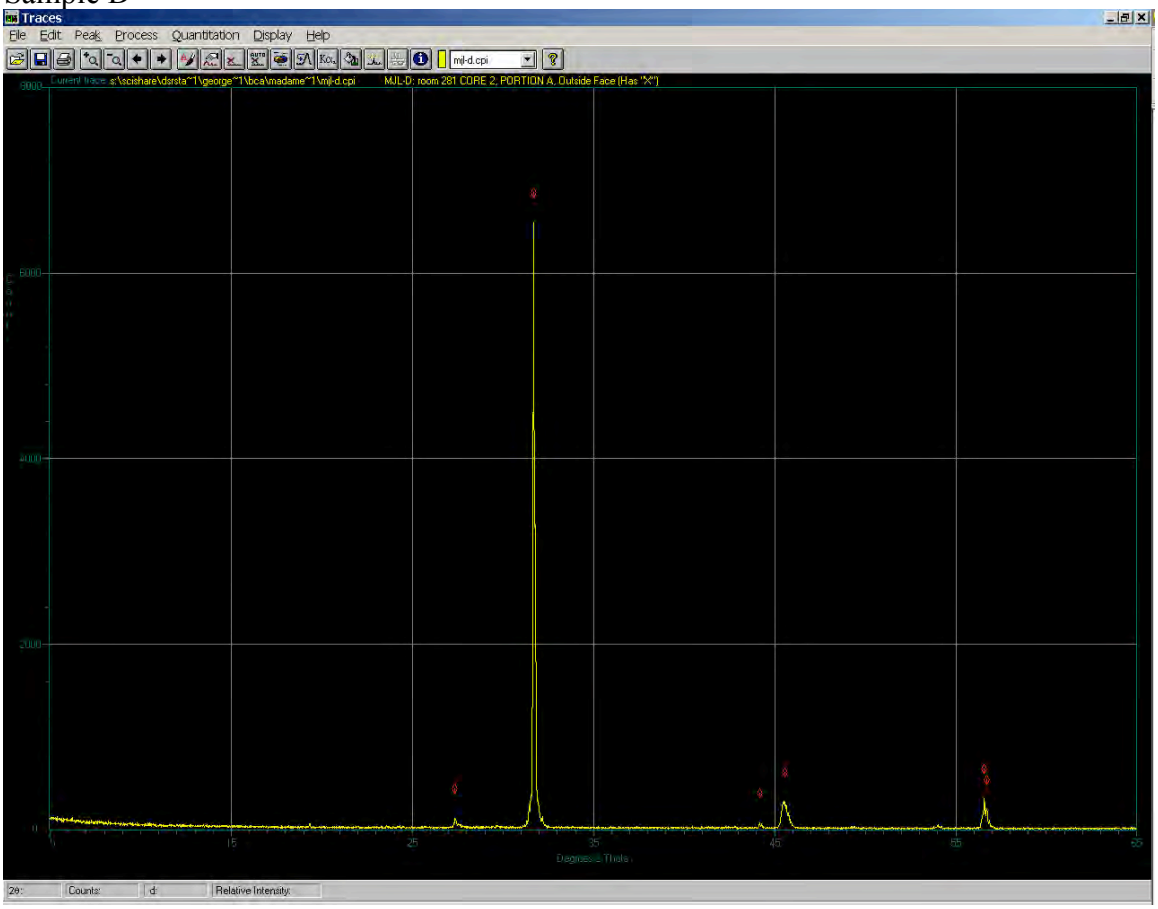
(Dr. George Wheeler)

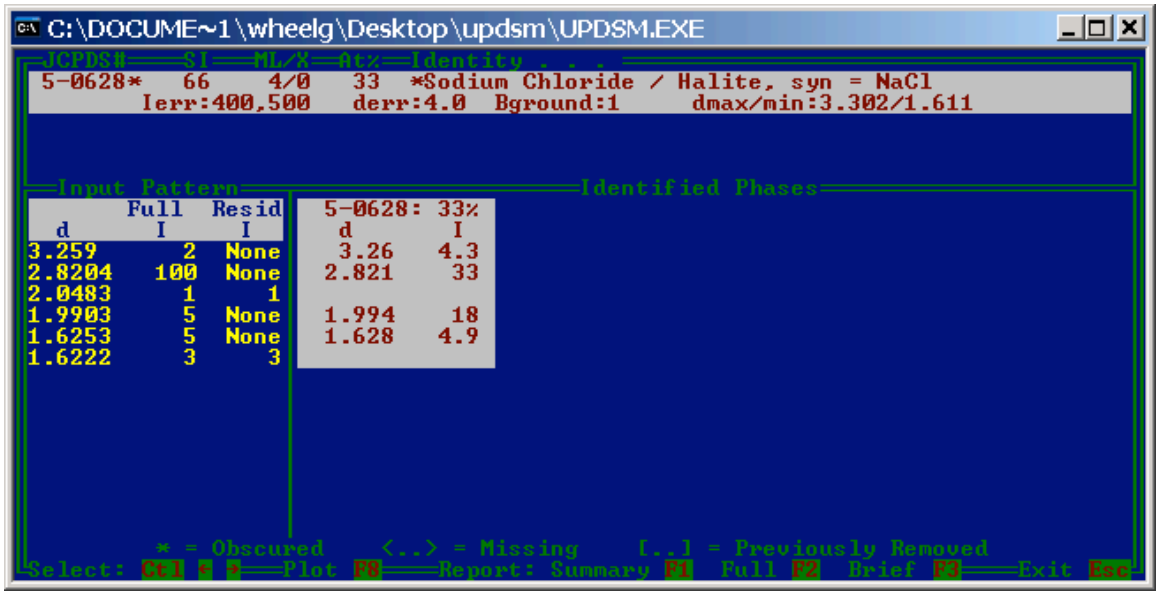
Sample J


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MJL-J: room 281, Wall, NE-4, 38" from floor and 6" from SE-1; surface salt
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1200
800
400
0
5
15
25
35
45
55
65
Degrees 2-Theta
2θ:
Counts:
d:
Relative Intensity:

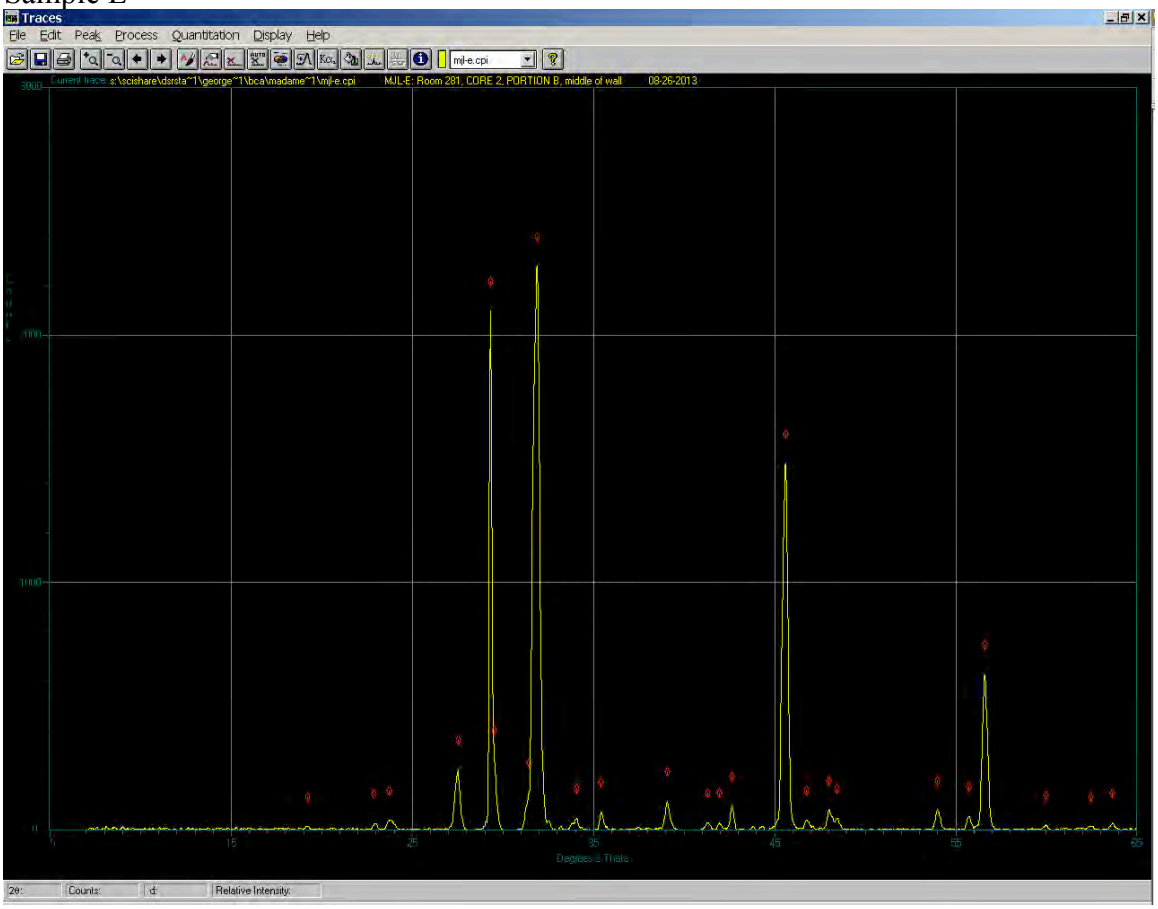

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4.553 9 None 4.58 10
4.052 4 4
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3.048 10 None 3.070 14
3.018 48 None 3.033 52
2.9192 11 11
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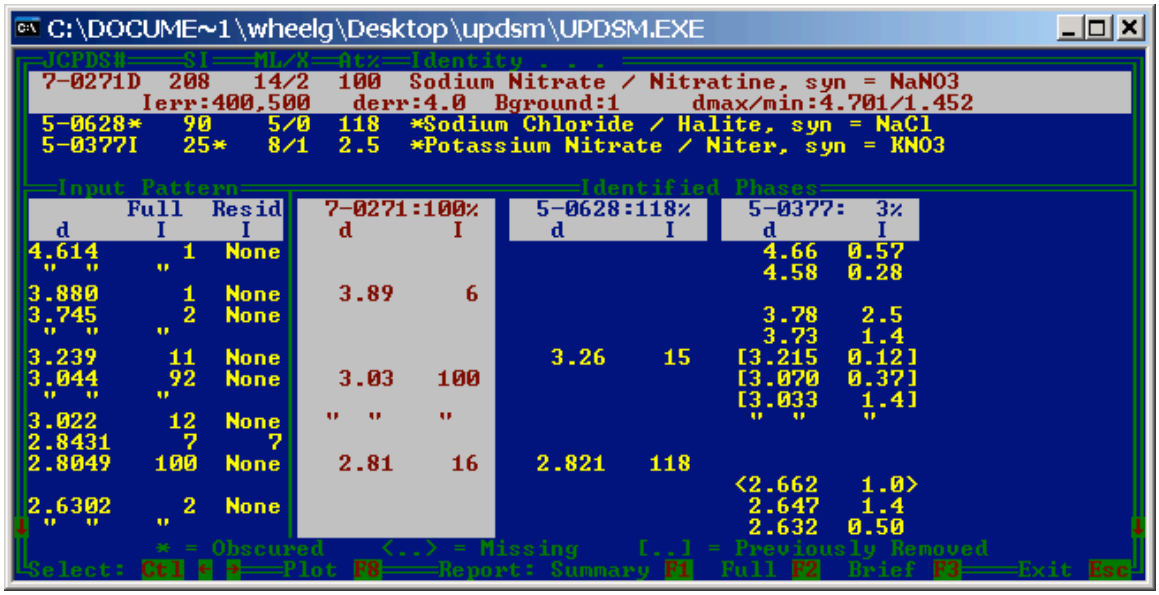
Sample D


Traces
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Degrees Theta
2θ: Counts: d: Relative Intensity:

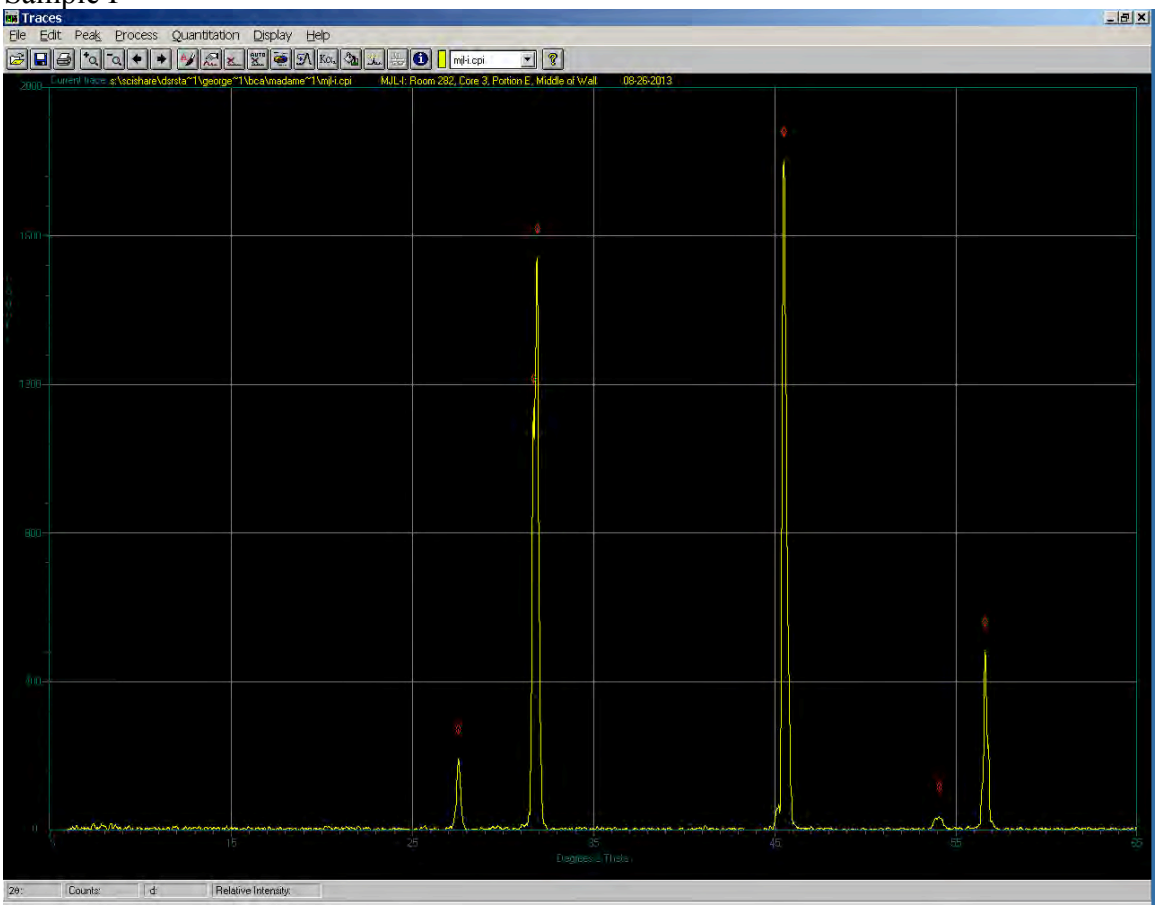

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Identified Phases
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1.9903 5 None
1.6253 5 None
1.6222 3 3
5-0628: 33%
d I
3.26 4.3
2.821 33
1.994 18
1.628 4.9
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Sample E


Traces
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mjl-e.cpi
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08-26-2013
Degrees-I Theta
2θ:
Counts:
d:
Relative Intensity:

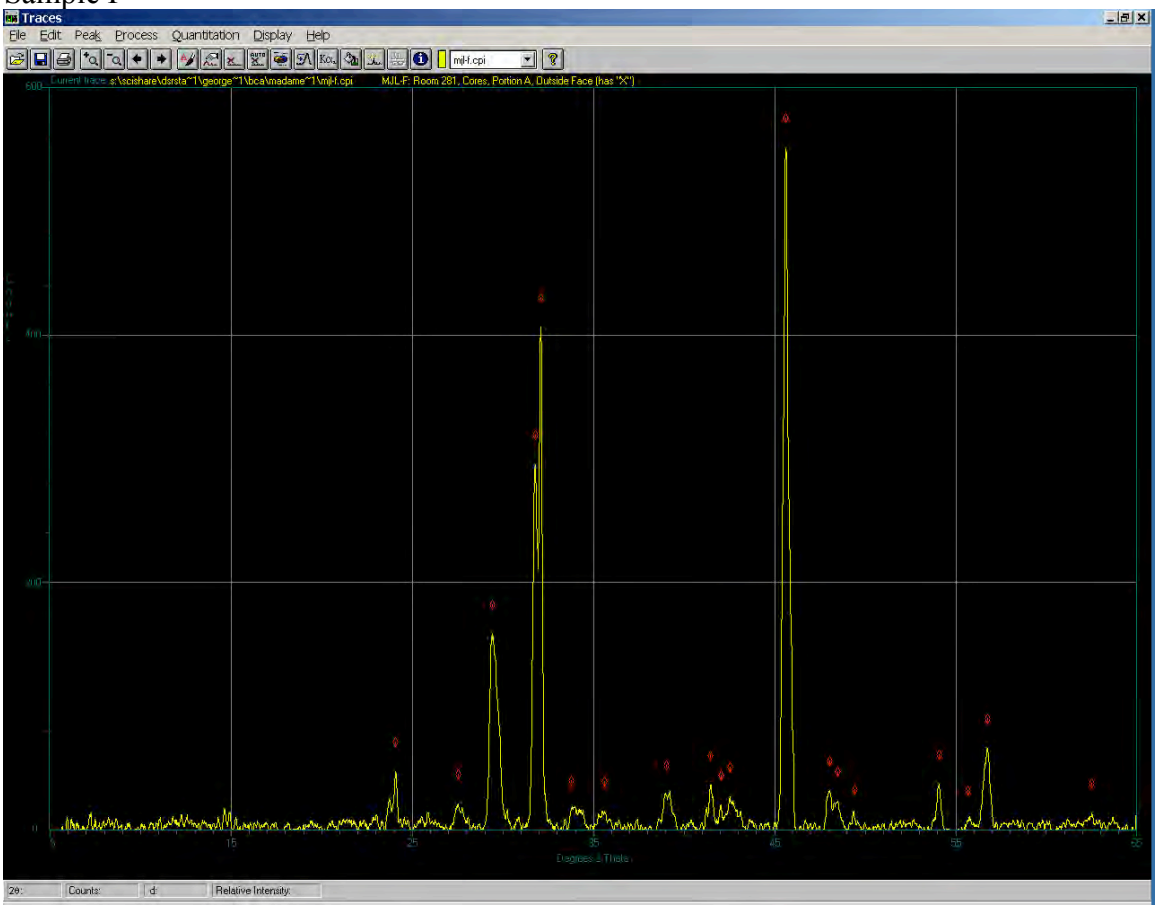

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5-0628* 90 5/0 118 *Sodium Chloride / Halite, syn = NaCl
5-0377I 25* 8/1 2.5 *Potassium Nitrate / Niter, syn = KNO3
Input Pattern
Identified Phases
d I Full I Resid I
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5-0628:118% d I
5-0377: 3% d I
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" " " 4.58 0.28
3.880 1 None 3.89 6
3.745 2 None 3.78 2.5
" " " 3.73 1.4
3.239 11 None 3.26 15 [3.215 0.12]
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" " " [3.033 1.4]
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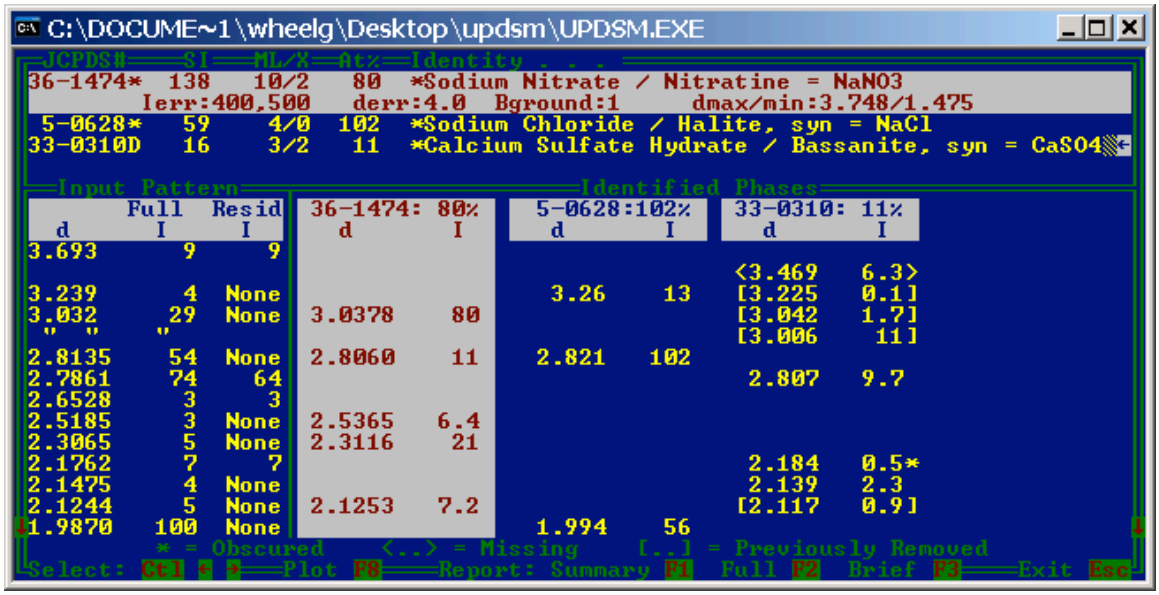
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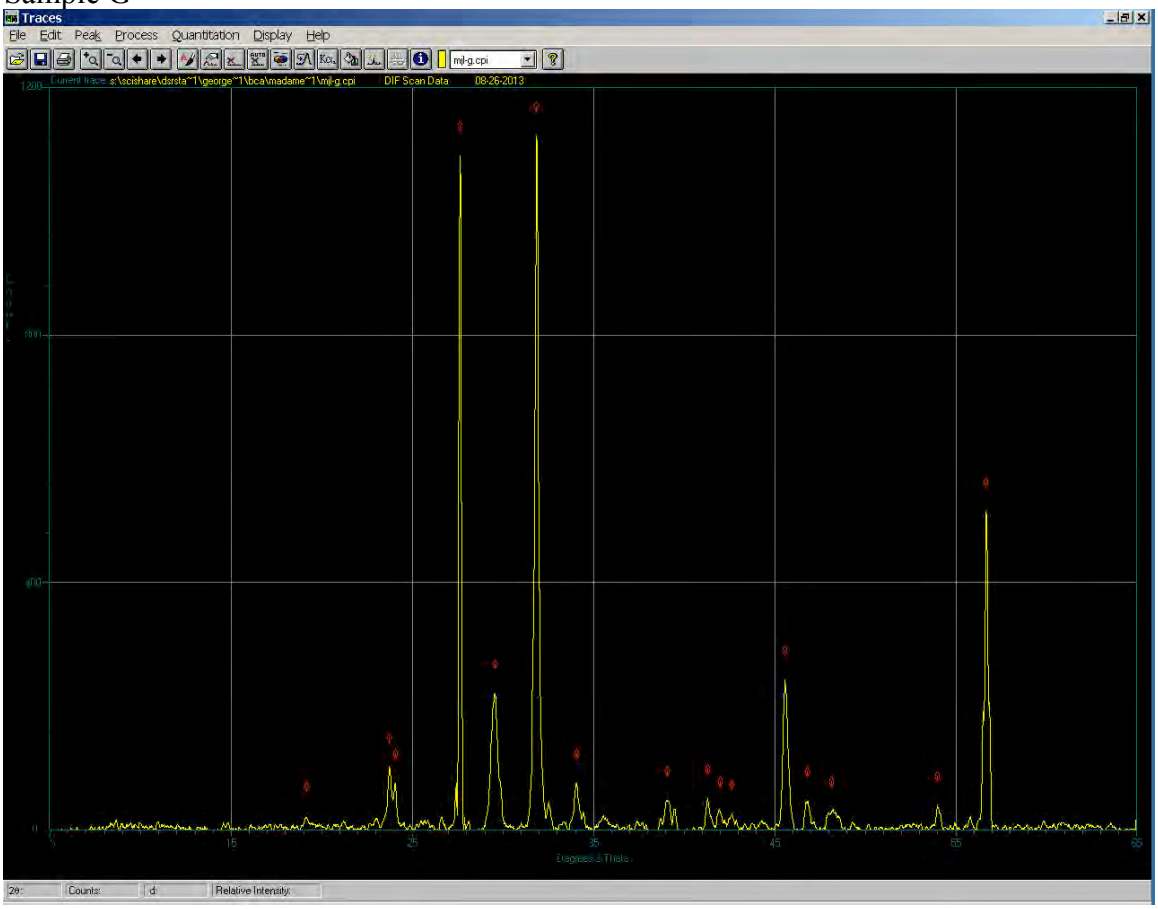
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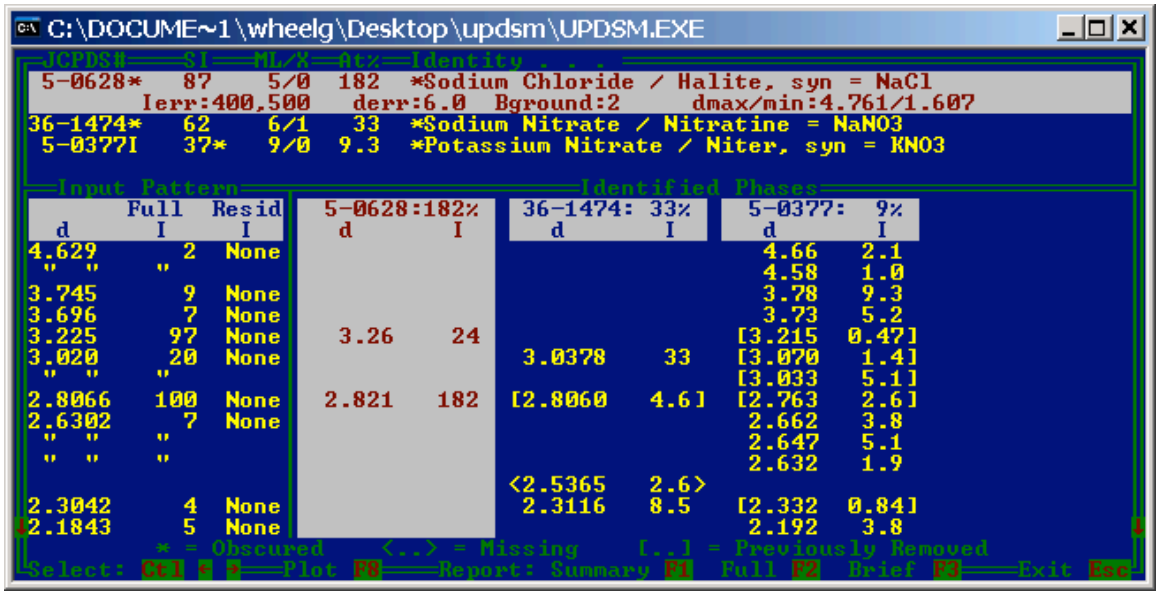
Sample F


Traces
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mjl-f.cpi
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33-0310D 16 3/2 11 *Calcium Sulfate Hydrate / Bassanite, syn = CaSO4
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2.8060 11
2.821 102
2.7861 74 64
2.807 9.7
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2.5185 3 None
2.5365 6.4
2.3065 5 None
2.3116 21
2.1762 7 7
2.184 0.5*
2.1475 4 None
2.139 2.3
2.1244 5 None
2.1253 7.2
[2.117 0.9]
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1.994 56
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Sample G


Traces
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mjl-g.cpi
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DIF Scan Data
08-26-2013
Degrees Theta
2θ:
Counts:
d:
Relative Intensity:


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JCPDS# SI ML/X At% Identity . . .
5-0628* 87 5/0 182 *Sodium Chloride / Halite, syn = NaCl
Ierr:400,500 derr:6.0 Bground:2 dmax/min:4.761/1.607
36-1474* 62 6/1 33 *Sodium Nitrate / Nitratine = NaNO3
5-0377I 37* 9/0 9.3 *Potassium Nitrate / Niter, syn = KNO3
Input Pattern
Identified Phases
d I Resid I
5-0628:182%
36-1474: 33%
5-0377: 9%
4.629 2 None 4.66 2.1
4.58 1.0
3.745 9 None 3.78 9.3
3.696 7 None 3.73 5.2
3.225 97 None 3.26 24 [3.215 0.47]
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[3.033 5.1]
2.8066 100 None 2.821 182 [2.8060 4.6] [2.763 2.6]
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Appendix H.

Getty Conservation Institute (GCI) Reports Regarding Madame John's Legacy Ground Floor Masonry

Madame John's Legacy: Site Visit Report

Stephen Farneth, FAIA

October 2007

A. Introduction

The following report is a summary of notes, observations, and recommendations made during an inspection/site visit on October 9-11, 2007. The site visit was scheduled to coincide with the site work of a team of conservators from the Getty Conservation Institute. The Getty conservators were on site to install test panels of different mixtures of poultices applied to the masonry basement walls to remove salts from the walls.

The purpose of my visit was to observe existing conditions and deterioration processes in the masonry walls, and outline a potential program of treatments which could remediate the masonry deterioration and conserve the masonry.

B. Background

Madame John's Legacy was constructed in 1789 after a devastating fire that destroyed a large area of the French Quarter. The site's long history has encompassed a series of different owners. The site was donated to the Louisiana State Museum in 1947. The site is managed as a house museum, open to the public.

There have been a number of rehabilitation and repair campaigns; one in 1971, and more recently in 1997.

C. Architectural Description

The property consists of three structures: the main house, fronting on Dumaine Street and two smaller structures, a kitchen and garconniere constructed behind the main house around an el-shaped interior courtyard.

All of the structures are two stories high with masonry walls and timber framed floor and roof structure. The structural system for the upper level of the main house is referred to as colombage construction, and consists of a heavy timber frame with brick masonry infill between the posts. This system is built above a series of masonry walls on the ground floor which originally served as a raised basement space. The building was apparently constructed on the foundations of the structure which existed prior to the fire.

The main house has a painted cement plaster exterior finish applied over the brick masonry of the lower level walls, and painted wood siding exterior finish over the upper level walls. The roof is a steeply sloped hipped roof with two projecting dormer vents on each side of the ridge. The roofing material is slate, fairly recently installed with copper gutters and downspouts.

The garconniere's masonry exterior walls are exposed brick with a cantilevered second floor wood porch. The building has a slate shed roof which pitches toward the courtyard, with copper gutters and downspouts.

The kitchen building walls are finished with painted cement plaster, with a cantilevered wood porch at the second floor, and a slate shed roof which pitches toward the courtyard. It also has a system of copper gutters and downspouts.

All of the buildings are fully air conditioned, served by a chiller located adjacent to the kitchen building. A large and fairly old air handler is located in the attic of the main house and serves the upper floor of the main house. A more recent fan coil unit located in the first floor western rest room area serves the lower level.

The brick masonry walls of the lower level of the main house are 4-wythes wide (approximately 18") for perimeter and primary bearing walls and 3-wythes wide (approximately 13") for other interior walls. The original masonry consists of soft and very porous brick with earliest mortars consisting of lime, sand, and earth. There are remnants of these mortars and rendering over the masonry still extant on the chimneys in the attic. The masonry of the lower level shows many generations of repairs and repointing. All of the repointing observed is with a fairly dense Portland cement mortar. Recently rebuilt piers and support walls utilized a more modern brick.

In addition to the reworking of the brick walls, the brick floor of the lower level is a recent installation. It consists of bricks set on a mortar setting bed over a 5 mil polyethylene moisture barrier.

D. Site Observations

Overall, the site and structures appear to be well maintained and are generally in good condition. The exterior finishes of the buildings appear to be in good condition. No significant roof leaking was observed in the main house.

Water intrusion is occurring in the second floor office of the kitchen building and is evaporating on the inside surfaces of the wall creating extensive salts and paint failure all around the window and along the adjacent wall. The specific source of the leak needs further evaluation, but water appears to be entering the masonry wall from the porch floor, and/or window sill area.

Numerous areas of site drainage problems were observed including:

- Clogged drains at the street, both east and west drainage outlets to the sidewalk were stopped with debris and dirt.

- Roof downspouts discharge water directly onto the courtyard brick paving which is intended to slope to site drains and surface gutters. There are a number of low areas where water collects, causing ponding and biological growth, and directing water into the walls of the building. This is most evident in the southeast corner of the courtyard and all along the eastern property line gutter.

- The sidewalk along Dumaine Street slopes back toward the building, depositing storm water under the front porch. Drains which were added in this area appear to be ineffective.

The masonry deterioration at the ground level of the main house is extensive and ongoing. It occurs consistently on the inside surfaces of all of the original masonry walls. The only exceptions to this deterioration are the cement plaster exterior finishes of the main house which are in good condition, and the recently-installed piers and pilasters in the lower level, constructed with a denser brick and mortar, which are also in relatively good condition. Also, the exposed masonry exterior walls of the garconniere appear to be in relatively good condition.

The walls of the lower level all have salts deposition on their surfaces. The masonry is flaking and powdering in the area where these salts evaporate from the surface. The zone of deterioration varies throughout the lower level, but exists mostly in a range from 2'-6" above the floor to 5'-6" above the floor. This seems to vary depending on local factors, such as wall thickness and area available for evaporation such as proximity to wall edges. The outside wall of the area below the front porch has the highest zone of deterioration, possibly because this wall surface is exposed to the humid exterior air and the evaporation from the wall occurs more slowly.

E. Diagnosis of Deterioration Processes

The deterioration observed in the brick is caused by the migration of salt-laden moisture through capillary action up the walls, evaporating on or just below the surface of the brick. The resulting salts crystallization breaks down the surface of the brick causing flaking and spalling of the brick. According to the Getty analysis, these salts are sodium sulphate which is particularly destructive, as it has a large volume increase as it crystallizes, causing destruction of the surrounding material.

This process has undoubtedly existed for a long time, however, it is greatly exacerbated by a number of recently imposed conditions:

- Repointing of the brick, with a dense Portland cement mortar has directed all of the evaporation to occur in the bricks themselves causing their rapid deterioration.

In the original wall construction, this evaporation would have occurred in the mortar joint (causing deterioration of the mortar, but preserving the brick) .

- Installation of the air conditioning system in the lower level. This system lowers the relative humidity of the spaces and greatly accelerates the evaporation of moisture from the wall, essentially sucking more moisture up the wall and evaporating it into the drier air, crystallizing more salts etc.
- Installation of the brick floor over a polyethylene moisture barrier. This barrier prevents the ground from breathing, thus forcing all of the ground moisture up through the walls.
- Problems with site drainage and storm water. Water is not effectively carried off site, creating more dampness in the ground, which provides dampness to the walls. (This may not be the only source of water to the walls, high water table, and/or water or sewer line leaks are also possible sources)

F. Potential Treatments / Recommendations

There are four general strategies for remediating the problem. They are not mutually exclusive:

- Reduce the sources and amount of ground water.
- Improve the walls' ability to evaporate moisture without damage.
- Reduce the walls' ability to absorb and transmit ground water.
- Reduce the evaporative "demand" on the wall.

These general strategies can be developed into a series of recommendations:

1. Improve the site drainage system:
    - Survey and upgrade the site drainage system to assure positive slopes to drains, including re-sloping the sidewalk along Dumaine Street
    - Create piped site drainage from the roof downspouts directly to the street.
    - Develop on-going maintenance procedures to assure drains are discharging into the street drainage system.
2. Restore the original wall integrity:
    - Remove all Portland cement mortar from the lower level walls. Repoint throughout with a weaker sacrificial lime mortar.

- Repair damaged brick walls where surface loss is extensive, using appropriate matching replacement bricks.

- Poultice all walls to remove as much of the existing salts as possible.

- Consider installation of a salts-absorbing sacrificial rendering on the surface of the masonry. This recommendation has obvious issues related to interpretation, appearance and maintenance and will require further discussion. (It would be interesting to know if these walls were originally rendered, and if the rendering material was the same as that found on the attic chimney surfaces.)

3. Reduce the walls' ability to absorb and transmit ground water:

    - Install a damp-proof course at the base of all of the walls. This could either be a physical damp proof course or a chemical one. For both cost and historic fabric preservation, a chemical damp-proof course would be the recommendation. The installation would involve drilling a series of closely spaced holes for injection ports all along the base of all of the walls and injecting, through low pressure or gravity, a water-repellant chemical into the masonry. The chemical is absorbed into the base of the wall, essentially creating a moisture barrier across the base of the wall, limiting absorption of ground water and stopping the process of capillary water migration up the wall. The chemicals used must be carefully selected for the existing conditions. Typically used chemicals include aluminum stearates, sodium or potassium siliconates, and alkyl siloxanes. The specific material for this project will need further evaluation.

    - Consideration might be given to removing the existing water proof membrane which is installed under the brick floor. This would allow the floor to breathe and reduce the amount of water directed into the walls. This action would probably cause a considerable increase in the humidity of the space. If the damp-proof course recommended above is successful, this proposal would not be necessary.

4. Reduce the evaporative "demand" on the wall:

    - Stop air conditioning the lower level of the building and return the lower level to equilibrium with the outside temperature and humidity. This will greatly reduce the speed of evaporation from the walls and will slow down the deterioration process.

    - This recommendation has obvious programmatic and comfort implications for the use of the space and will require further discussion. It may be that recommendations 1-3 above will be sufficient to solve or greatly reduce the problem.

G. Next Steps:

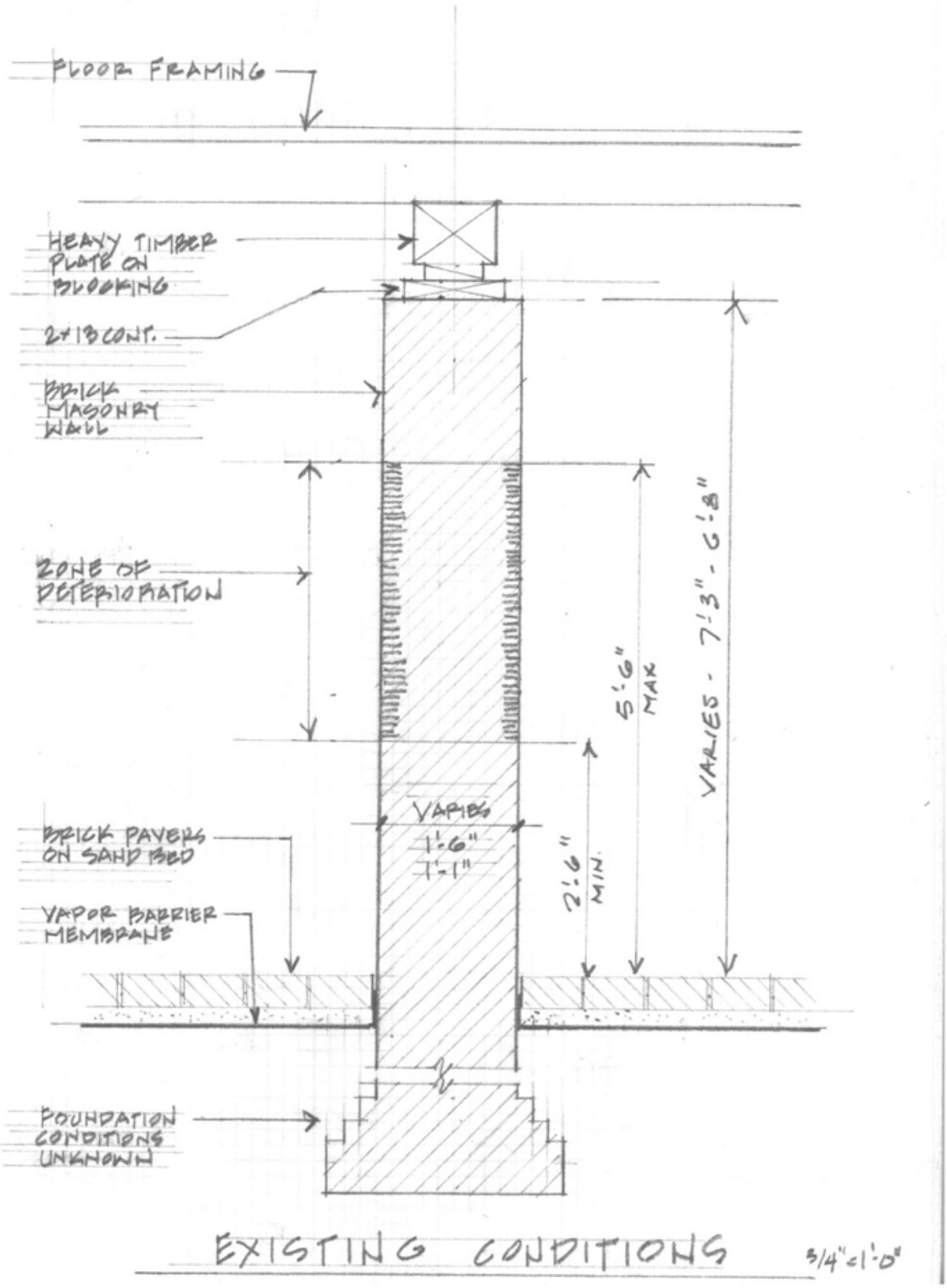
The following tasks are suggested to move the project forward:

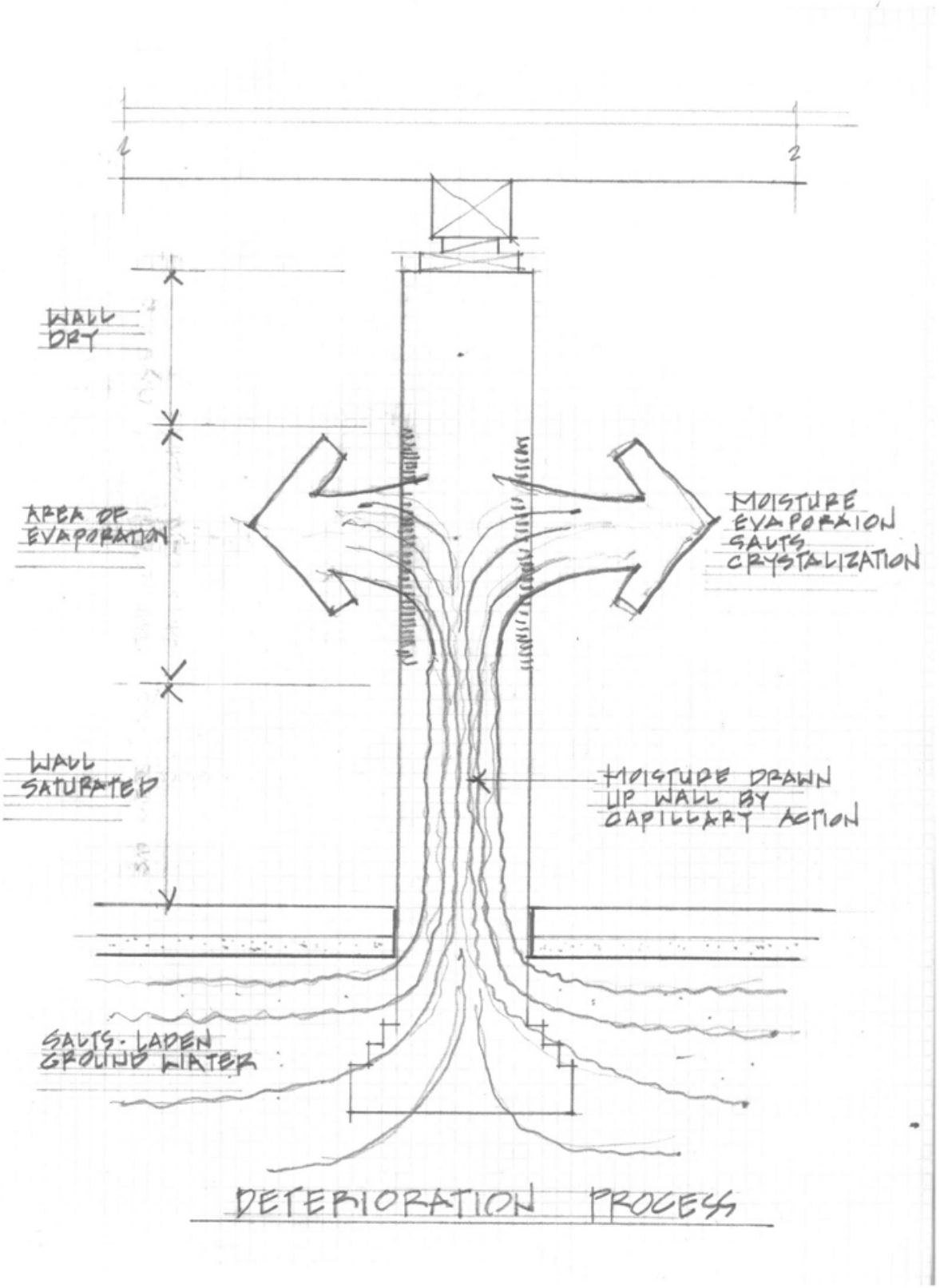
1. Review the above recommendations with Louisiana State Museum staff and Getty conservators.

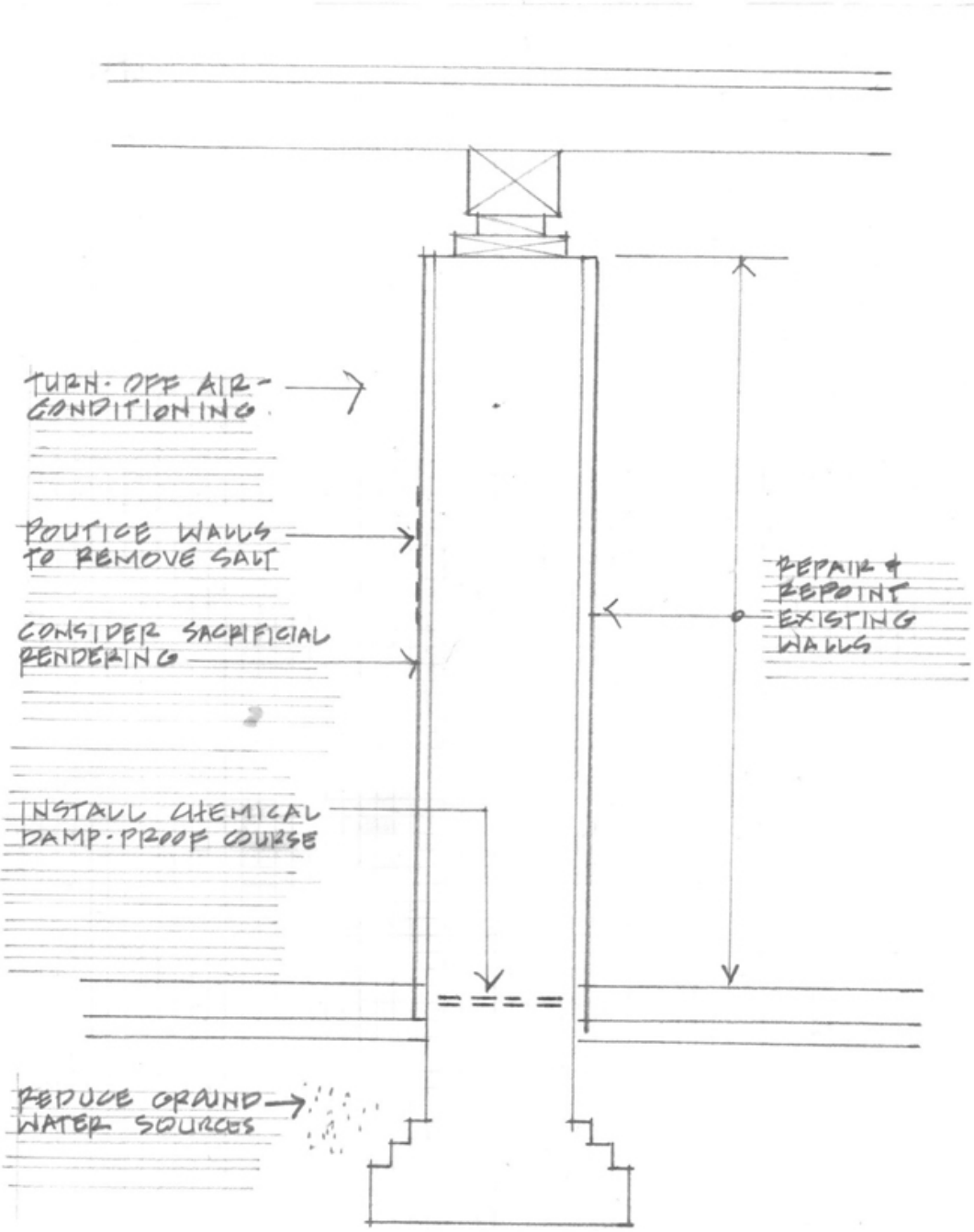
2. Based on the discussion and comments, prepare a more detailed proposed scope of work and cost estimate for the project.

3. Develop outline specifications for the brick, mortar, and damp-proof course work, then select a section of wall and construct a sample test of all proposed wall repair systems. Test alternative damp-proof course materials.

4. Based on the findings, prepare plans and specifications for the project.


FLOOR FRAMING
HEAVY TIMBER PLATE ON BLOCKING
2x13 CONT.
BRICK MASONRY WALL
ZONE OF DETERIORATION
5'-6" MAX
VARIES - 7'3" - 6'8"
VARIES 1'-6" 1'-1"
2'-6" MIN.
BRICK PAVERS ON SAND BED
VAPOR BARRIER MEMBRANE
FOUNDATION CONDITIONS UNKNOWN
EXISTING CONDITIONS
3/4"=1'-0"


1
2
WALL DRY
AREA OF EVAPORATION
WALL SATURATED
MOISTURE EVAPORATION SALTS CRYSTALIZATION
MOISTURE DRAWN UP WALL BY CAPILLARY ACTION
SALTS-LADEN GROUND WATER
DETERIORATION PROCESS



TREATMENT RECOMMENDATIONS



Main House Dumaine Street Facade



Main House Courtyard Facade



Kitchen Building Courtyard Facade



Garconniere Courtyard Facade



Drainspout/Drain Detail



Drain at Northeast



Interior Wall Elevation



Interior Wall Elevation



Brick Deterioration Detail



Brick Deterioration Detail



Brick Deterioration Detail

Proc. 11th Int. Cong. on Deterioration and Conservation of Stone, Torun, Sept. 15-20, 2008

EVALUATION OF POULTICE DESALINATION PROCESS AT MADAME JOHNS' LEGACY, NEW ORLEANS

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Abstract

Within the framework of the EU project "Desalination", Madame John's Legacy in the French Quarter of New Orleans was selected as a field site to evaluate the effectiveness of four desalination poultices under warm and humid environmental conditions. The poultices were applied to salt-laden brick walls in a sheltered exterior environment and in an air-conditioned ground floor. Effectiveness was defined to take into account the percentage of salts removed as well as the depth of desalination. Preliminary results from the investigation demonstrate the importance of environmental conditions, shrinkage, adhesion and drying rates in poultice effectiveness. Desalinating masonry in a humid environment led to leaving the poultice on for months instead of weeks, resulting in a significant reduction in salt content of well over 90% for two poultices.

Keywords: poultice desalination, salt reduction, rising damp, masonry conservation.

1. Introduction

Optimizing the removal of soluble salts from contaminated building materials is an important topic in the treatment of history masonry and wall paintings (Leitner, 2006; Vergès-Belmin and Siedel, 2005). There have been a number of meetings dedicated to the problem of salts and desalination (Petzet, 1996; SFIIC, 1996; Simon and Drdacky, 2006) which have helped to illustrate some of the problems associated with large scale desalination efforts. These problems include unexpected mobilization of salts by excess water, poor extraction of salts from some materials, and rapid re-appearance of salts after some treatments.

One method of salt reduction commonly used by stone conservators is simply to apply a poultice, analogous to blotting a stain on a piece of clothing. One of the advantages of poultice treatments is that the material remains 'retreatable' after the intervention, as no new material is permanently introduced to the substrate other than water.

The poultice is typically a porous, hydrophilic mixture of materials that is wetted to a consistency where it can be applied and adhere to vertical surfaces such as sculpture and walls. When applied to a porous, salt-contaminated substrate, some of the moisture is transferred from the poultice to the substrate and then--in theory--back to the poultice

along with some of the dissolved salts (Terheiden and Kaps, 2003). Poultices often shrink as they dry and may detach from the wall, at which point they cease to extract moisture and salts (Verges-Belmin, 2006).

There are several ways to improve removal of salts with poultices such as: 1) Optimize the pore characteristics and structure of the poultice relative to the substrate--finer pores for suction, coarser pores for water and later salt storage, with a structure that minimizes shrinkage. 2) Optimize the amount and rate of moisture introduced. Standard poultices are a byproduct of cleaning methods and recent work shows that their application in some cases results in the rearrangement of salts rather than in their reduction (Lombardo and Simon, 2006). 3) Improve the interface and application/removal process. The detachment of the poultice layer due to drying and cycling is clearly important, however it is not well understood. 4) Better understand the effect of environment and relative humidity on drying rates and poultice effectiveness (for example, transport of salts by advection vs. diffusion). Field tests are needed to begin to evaluate these processes, examining both the efficiency and effectiveness of poulticing in reducing rates of salt weathering as well as the recurrence of salts. If conservators can more efficiently remove salts, poulticing may receive greater use as an element of routine maintenance.

To test some of these processes, and as part of a larger EU project on guidelines for desalination (DESALINATION, 2008), the site of Madame John's Legacy was selected as a case study of poultice desalination. One of the oldest buildings in Louisiana, dating to 1789, it is an important example of Creole architecture (Riegel et al., 2005)(Fig. 1). The brick masonry at the site contains significant soluble salts after a 1998 restoration effort to help deal with termite issues and enable the ground floor to be used as museum display space (Fig. 2). The high humidity of Louisiana was expected to result in drying of poultices slower than in some other sites where comparative studies are taking place.



Figure 1. Madame John's Legacy, a 1789 brick and wood building in the French Quarter of New Orleans which is affected by soluble salts.

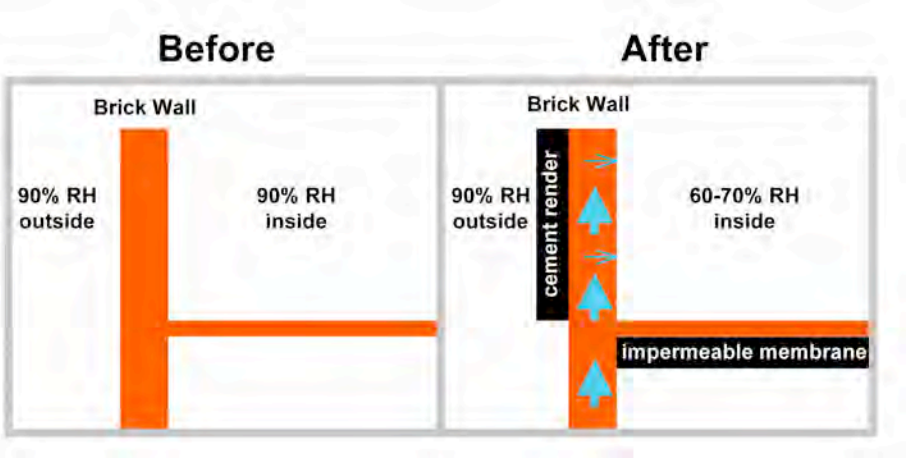


Figure 2. Cross section diagram of brick wall at Madame John's Legacy showing the situation before and after a 1998 renovation added a cement render to the exterior, an impermeable membrane to the floor and air conditioning to the ground floor (not to scale). Salt weathering of the interior brick was a notable problem starting in 2002 with the likely path of moisture transport outlined with blue arrows.

2. Materials and Methods

The condition of the walls was documented photographically on three occasions before poulticing, which aided in the selection of areas where both active damage was taking place and concentrations of salts were noted. The salts in the walls were characterized using ESEM-EDS, XRD and ion chromatography before and after poulticing in three areas: two interior spaces and one sheltered exterior space. Four poultices using commonly available materials and recipes were tested, namely a commercial poultice, one paper pulp poultice, one paper pulp/clay poultice and one clay/sand poultice (Tab. 1). The sand fraction used was from 0.5 to 1.0 mm. Details can be found in Bourges and Verges-Belmin (2008). The poultices tested have a 16-fold range in water content and it was found that the base of the poultice was wet while the upper section was significantly dryer due to differences in moisture uptake. Two drying conditions were tested: a sheltered exterior site and an air-conditioned ground floor.

Table 1. Desalination poultices tested at Madame Johns Legacy.

Panel A: Arbocell BW40/BC1000 mixture, Outdoor	Panel B: Commercial Poultice 1, Indoor	Panel C: Arbocell BW40/BC1000 mixture, Indoor
Panel X: Commercial Poultice 1, Outdoor	Panel Y: Cellulose/Sepiolite mixture, Outdoor	Panel Z: Bentonite/sand mixture, Outdoor

2.1 Sampling Procedure

Small samples of powdered brick were acquired at four depths (0-1, 1-2, 2-4, 4-6 cm) and four heights from the floor (0.1, 0.5, 1, 1.5 and 2 meters) to characterize the salt distribution in the wall before and after the poulticing. A 3 mm ceramic drill bit was used with a variable-speed, battery-powered drill operated at low speed to reduce the effects of heating on the powders. The powders were dried in a 40 C oven until their weight was stable and ~0.06 g was dissolved in 10 ml of ultra-pure water (18.2 megaOhms) for three days (agitated) and then filtered before ion chromatography analysis. The longer dissolution time was undertaken in an effort to dissolve more of the gypsum present in the samples. The poultice samples were extracted from the surface with a scalpel as 5 x 5 cm pieces, which were subsequently homogenized and aliquots prepared for ion chromatography. The poultices were applied October 10-11th, 2007 and removed April 2nd, 2008.

3. Results and Discussion

Salts identified by XRD and ESEM include mirabilite, thenardite, sodium chloride, gypsum and sodium nitrate, with the first three salts predominating. The distribution of the salts follows a pattern influenced by the use of hydrophobic agents at the base of the wall. Also, salts of somewhat lower solubility, such as sulfates, occur lower on the wall and more soluble nitrates and chlorides occur higher up on the wall. This separation of salts based on solubility is a common phenomenon. Photographs of the drying patterns show that in two cases, the poultice dried from the top and bottom, leaving the middle of the poultice area (with the highest salt concentrations) to dry last. Before poulticing, salts were observed deliquescing in the middle of the wall.

3.1 Ion Chromatography results from wall before and after poulticing

Representative anion and cation concentrations profiles from the bricks before and after poulticing are reviewed for poultice panel A in figures 3 and 4 (Arbocell BW40-BC1000 50/50 mix). The results for panel A show high concentrations of sodium chloride and sodium sulfate before poulticing and low concentrations after poulticing. An increase in gypsum concentration (calcium and sulfate) could be a sampling issue or a result of the removal of the more soluble fraction. The solubility of gypsum may be influenced by the presence of other salts (He et al., 1994). Initial sulfate levels are significantly higher at the 50 cm height (Fig. 4) than at the 100 cm height (Fig. 3), while chloride levels are lower at the 50 cm level than the 100 cm level.

3.2 Ion Chromatography analysis of poultice

Salt concentrations in the poultice evaluated by ion chromatography (Fig. 5-6) show results consistent with the wall profiles with up to 2200 mEq of chloride per gram of poultice extracted. The results confirm that the majority of the salts removed were from the middle of the wall, and relatively little salt was removed from the base of the wall.

This was expected, since the bases of the walls were treated at in the early 1990s with a hydrophobic treatment (Eugene Cizek, personal communication).

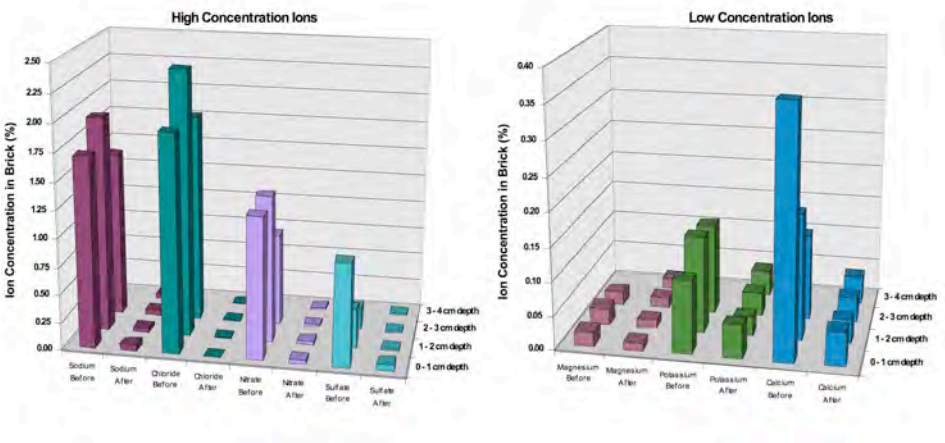


Figure 3. Depth profiles in brick showing changing ion concentrations in masonry wall at 100 cm wall height before and after poulticing with paper pulp mixture, panel A.

The results from the poultice generally mirror the brick profiles, with substantial chloride, nitrate and sulfate salts removed. The efficiency of desalination can be evaluated by considering the percentage of salts removed (Domaslowski and Kesy-Lewandowska, 1998). Several elements in the poultice A data show greater than 90% removal efficiency, which is high compared to that achieved by Domaslowski. This efficiency is likely tied to the extended length of the treatment (months vs. weeks) and the good adhesion of the poultice to the brick surface during drying.

4. Conclusions

The poulticing of salts under humid conditions was not expected to result in efficient removal due to the slow drying conditions and anticipated limited mobilization. Instead, efficiencies well over 90% were achieved due to the extended time the poultice was left on the walls. Also, the limited shrinkage of the poultice in the humid conditions apparently led to less poultice detachment than is often the case. Typical results for poultice efficiency are on the order of 50-70% (Domaslowski and Kesy-Lewandowska, 1998). The results acquired in this study support the common practice of many conservators in Mediterranean regions of sheltering poultices from drying too rapidly. Additional analyses are needed to evaluate the question if better desalination results can be obtained by designing poultices that have a lower shrinkage factor and if extending the time of poulticing may be a useful strategy for conservators.

5. Acknowledgements

This work was undertaken within the frame of a collaboration between the Louisiana State Museum and The Getty Conservation Institute as part of a larger EU project: Desalination (022714). Funding for this research came from the Getty Conservation Institute. We acknowledge the support and advice of Jeanne Marie Teutonico, Stephen Farneth, David Kahn and our European partners in this research. We acknowledge Veronique Verges-Belmin for her good advice and assistance in the field. Shin Maekawa and Vincent Beltran analyzed and advised on environmental monitoring data. The assistance of Cecily Grzywacz, David Carson, and Joy Mazurek with ion chromatography is much appreciated. Special thanks are due to the Tulane University conservation students who volunteered their time to aid our research: Katie Ashwill, Steve Wallace, Emily Levings, Erin Edwards, Mara Saxer, Emett Luty and Candace Crawford.

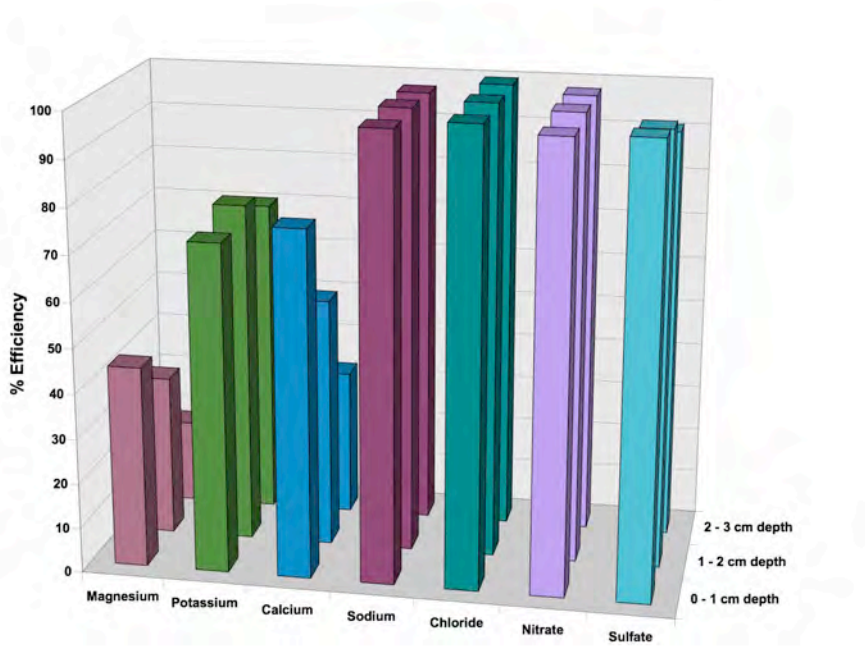


Figure 4. Efficiency profiles versus depth in panel A for soluble ions. Note abundant ions show no change in removal efficiency with depth while less common ions show a trend of decreasing efficiency of removal with depth (see fig 3).

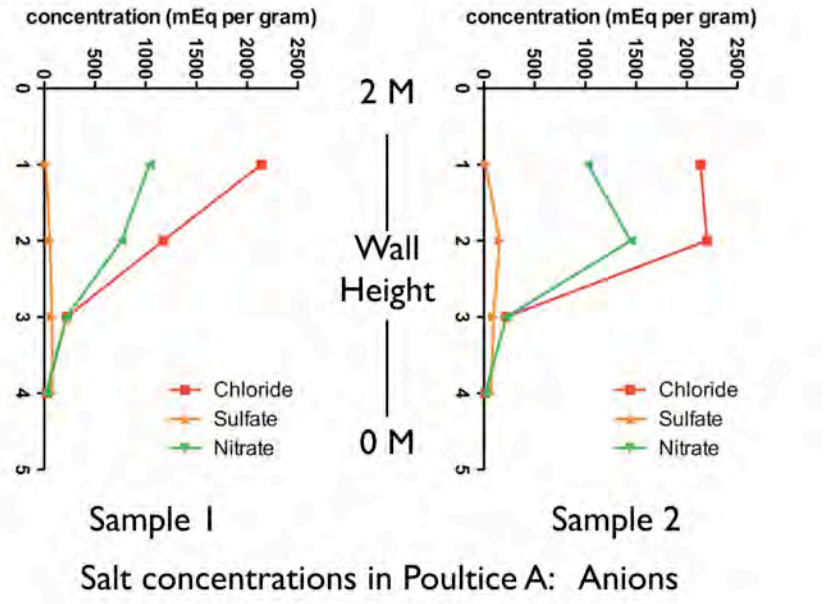


Figure 5. Height profiles showing ion concentrations in paper pulp poultice in two replicate samples. Note similar profiles and low concentrations at the base of the wall.

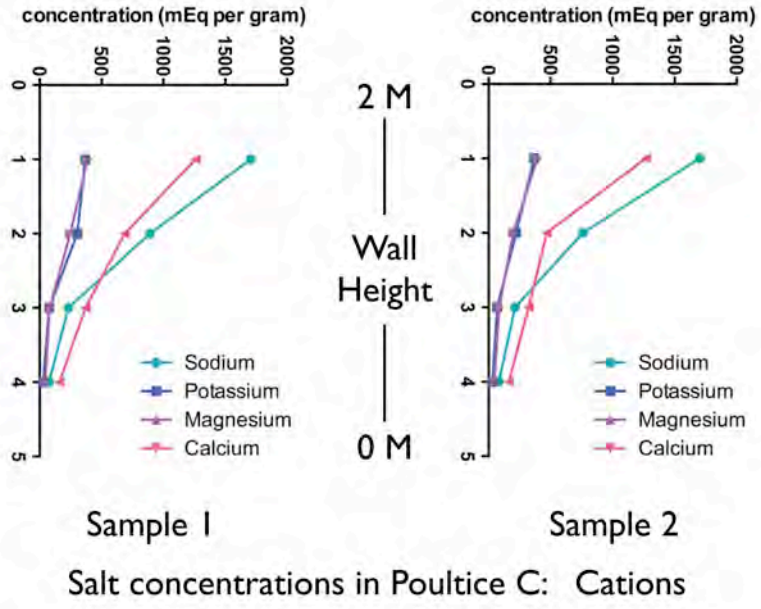


Figure 6. Height profiles showing ion concentrations in paper pulp poultice in two replicate samples. Note similar profiles and low concentrations at the base of the wall.

6. References

Bourges, A. and V. Verges Belmin, 2008. Comparison and optimization of five desalination systems on inner walls of Saint Philibert Church in Dijon, France. Proc. of Salt Weathering on Buildings and Stone Sculpture, Ed. Judith Selk Albertsen. Technical University of Denmark, Copenhagen.

DESALINATION, 2008. Assessment of desalination mortars and poultices for historic masonry: EU Project Desalination; http://www.bk.tudelft.nl/desalination, Delft, TNO.

Domaslowski, W. and M. Kesy-Lewandowska, 1998. Wplyw warunkuw odsalania kamieni na efektywnosc usuwania soli [The influence of desalination conditions on the effectiveness of removing salts]. Zabytkoznawstwo i konserwatorstwo 30, 59-71.

He, S., J.E. Oddo and M.B. Tomson, 1994. The nucleation kinetics of calcium sulfate dihydrate in NaCl solutions up to 6 M and 90 °C. J. Colloid Interf. Sci. 162, 297–303.

Leitner, H., 2006. The Treatment of Salt Effected Wall Paintings as Interdisciplinary Task, Seen from the View of a Conservator Ariadne 13, Problems of salts in masonry - SALTeXPERT, ARCCHIP Centre of Excellence Workshop and The Getty Conservation Institute, 301-314 City.

Lombardo, T. and S. Simon, 2006. Laboratory Study on Desalination by Poultices Ariadne 13, Problems of salts in masonry - SALTeXPERT, ARCCHIP Centre of Excellence Workshop and The Getty Conservation Institute, 275-286. City.

Petzet, M., ed., 1996. Salzschäden an Wandmalereien, 78. München, Arbeithefte des Bayerischen Landesamtes für Denkmalpflege, 222 p.

Riegel, C., M. Gilberg, E. Freytag*, et al.*, 2005. Long-term protection of madame John's legacy house from subterranean termites using hexaflumuron. Stud. Conserv. 50, 267-274.

SFIIC, 1996. Les Dessalement des Matériaux Poreux. Congrès SFIIC. Section Française de I'lnstitut International de Conservation (SFIIC). Paris.

Simon, S. and M. Drdacky, eds., 2006. European Research on Cultural Heritage (State of the Art Studies, 5): Problems of salts in masonry–SALTeXPERT: Ariadne 13. Prague, ITAM Institute of Theoretical an d Applied Mechanics, 368 p.

Terheiden, K. and C. Kaps, 2003. Compression desalination. Effective ion transport processes and their limitations. GDCh-Monographie 25, 148-150.

Verges-Belmin, V., 2006. Desalination of Porous Building Materials: a Review Ariadne 13, Problems of salts in masonry - SALTeXPERT, ARCCHIP Centre of Excellence Workshop and The Getty Conservation Institute, 249-274. City.

Vergès-Belmin, V. and H. Siedel, 2005. Desalination of Masonries and Monumental Sculptures by Poulticing: A Review. Restoration of Buildings and Monuments = Bauinstandsetzen und Baudenkmalpflege 11, 1–18.

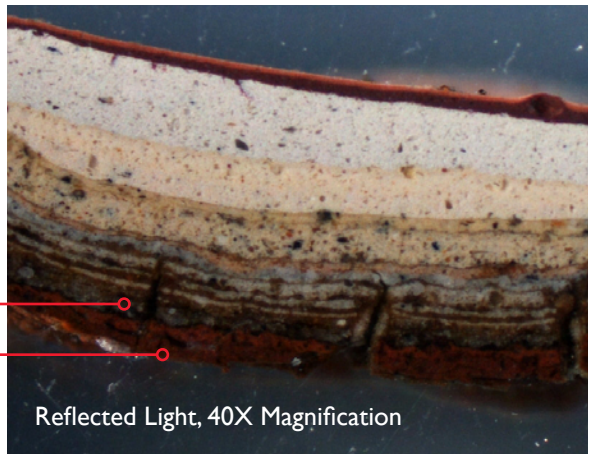
Appendix I.

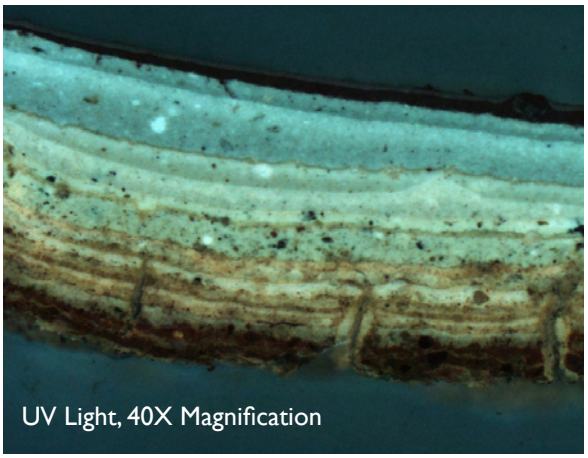
Paint Stratigraphies and Photomicrographs

(Building Conservation Associates, Inc.)



SAMPLE ID: MJL-1
SAMPLE LOCATION: Lakeside elevation, clapboard at top of wall under roof between front two windows - from protected area under eave.



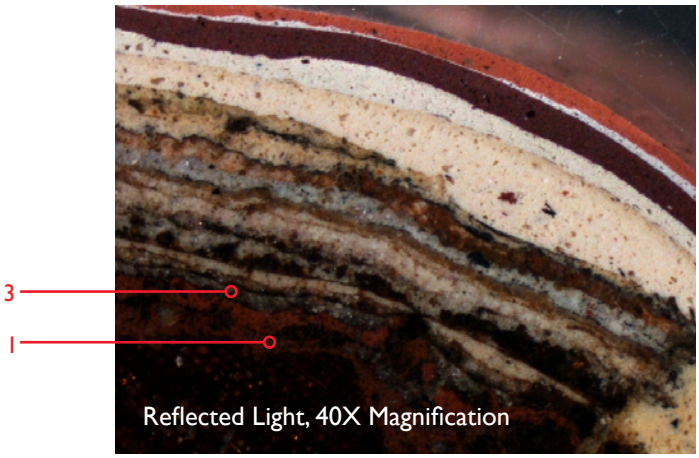


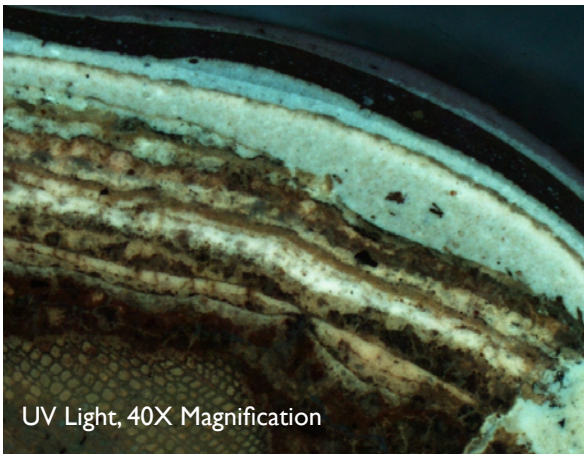
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Red-brown	Black	Earliest existing
2	Red-brown	Black	
3	Gray-green	Green-blue	1st unified campaign
4	Brown	Yellow	
5	Cream	Yellow	
6	Brown	Yellow	
7	Light Gray	White-blue	
8	White/cream	White-blue	
9	Light blue	White-blue	
10	Pink	Yellow-pink	
11	Tan	Blue-green	
12	Tan	Green-tan	
13	Yellow-cream	White-blue	
14	Yellow-cream	White-blue	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	Yellow-cream	White-blue	
16	White	Blue	
17	White	Blue	
18	Red-brown	Black	
19	Red	Gray	Current color



SAMPLE ID: MJL-2
SAMPLE LOCATION: Lakeside elevation, clapboard, fourth from top of wall above front window - from protected area under eave.



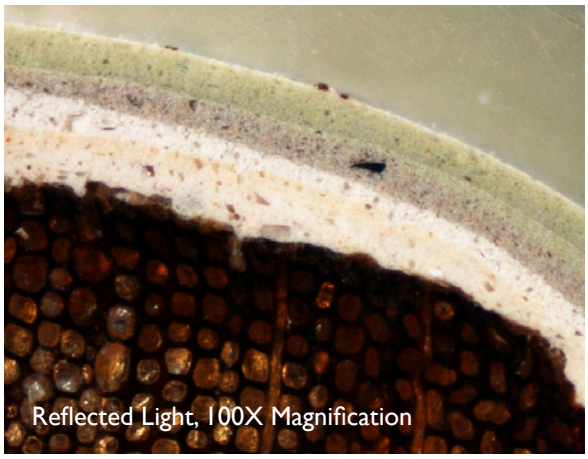


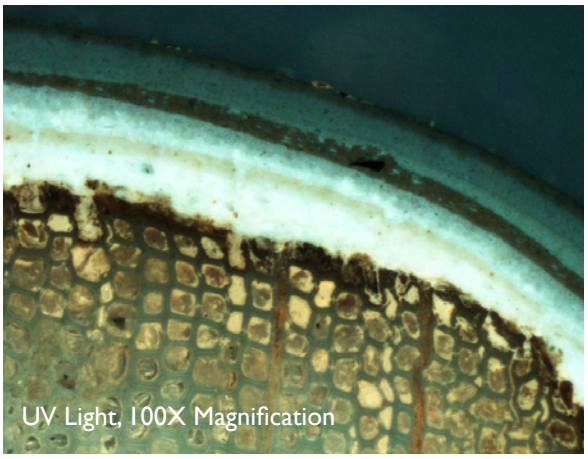
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Red-brown	Black	Earliest existing
2	Red-brown	Black	
3	Gray-green	Black	1st unified campaign
4	Brown	Brown	
5	Cream	Yellow	
6	Brown	Brown	
7	Gray-cream	Yellow	
8	Cream	Yellow	
9	Cream	Yellow	
10	Gold-brown	Brown	
11	Gray-white	Yellow	
12	Pink-cream	Brown	
13	Yellow-cream	Brown	
14	Yellow-cream	Blue-white	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	Cream	Blue-white	
16	Cream	Brown	
17	White	Blue-white	
18	White	Blue-white	
19	Dark red	Black	
20	White	Blue-white	
21	Red-orange	Gray	Current color



SAMPLE ID: MJL-4
SAMPLE LOCATION: Rear porch, second floor level, top clapboard just under ceiling


Reflected Light, 100X Magnification

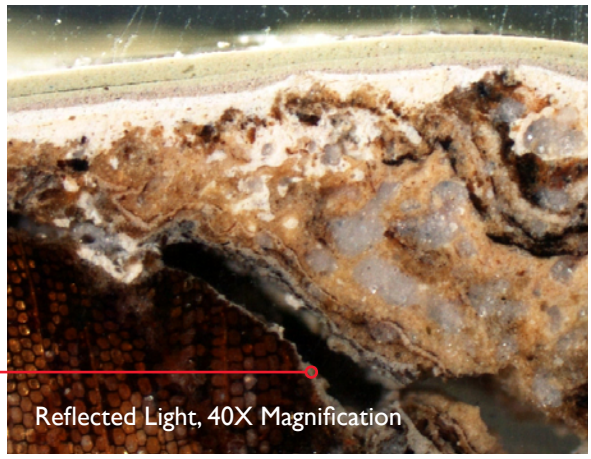

UV Light, 100X Magnification

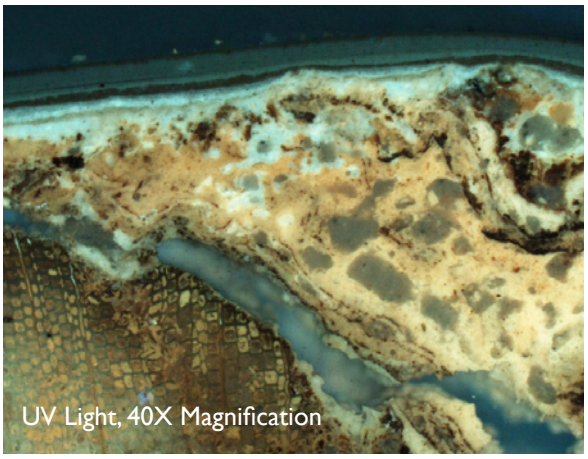
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Yellow-cream	White	20th Century
2	Yellow-cream	Yellow	
3	White	Blue-white	
4	White	Blue-white	
5	Purple-gray	Blue-white	
7	Purple-gray	Green-brown	
7	Lt green	Blue-white	
8	Lt green	Blue-white	
9	Lt green	Black	Current color

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES



SAMPLE ID: MJL-5
SAMPLE LOCATION: Rear porch, second floor level, top clapboard just under ceiling



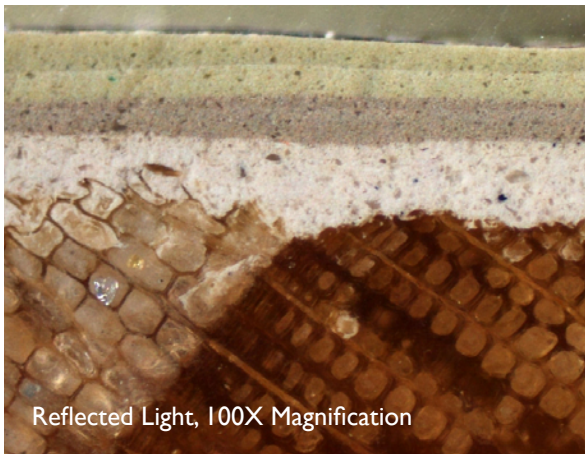


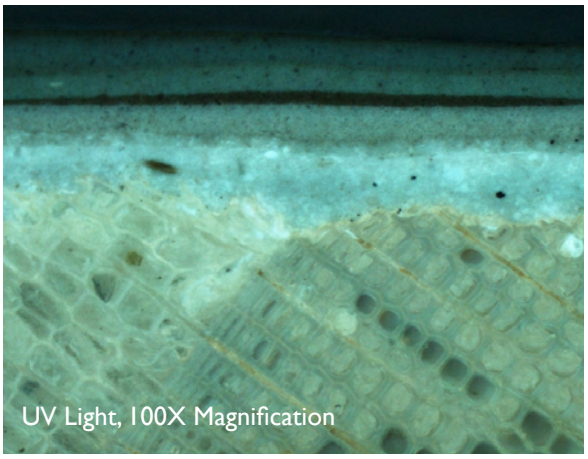
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Gray-green	Yellow	Earliest existing
2	Brown	Yellow	Partial layer
3	Golden brown	Yellow	Partial layer
4	Tan	Yellow	Partial layer
5	Tan	Yellow	Partial layer
6	Brown	Yellow-brown	Partial layer
7	Lt Yellow-cream	Blue-white	
8	White	Blue-white	
9	Purple-gray	Black	
10	Light green	Blue-white	
11	Light green	Blue-white	Current color

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES



SAMPLE ID: MJL-6
SAMPLE LOCATION: Rear porch, second floor level, 1970s clapboards/infill.


Reflected Light, 100X Magnification

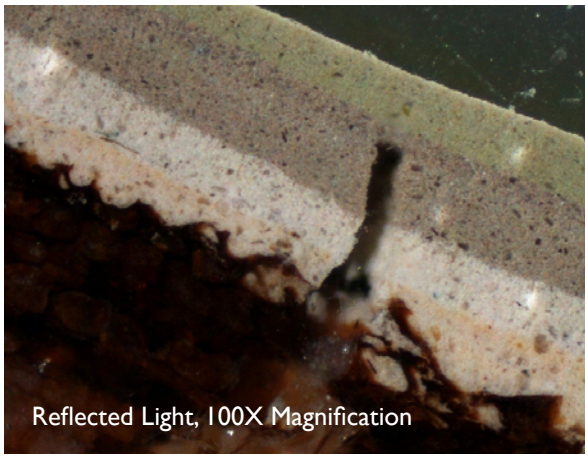

UV Light, 100X Magnification

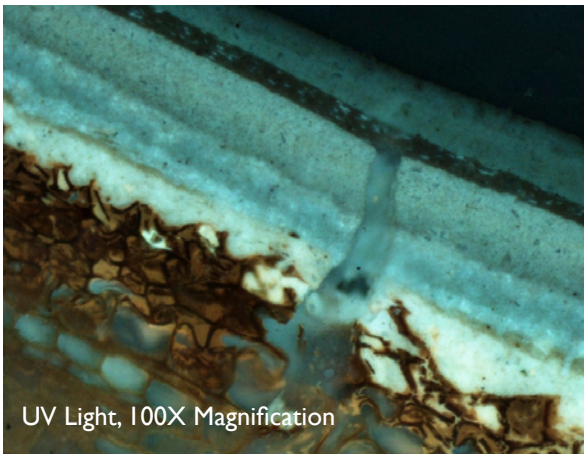
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	White	Blue-white	20th Century
2	Gray	Blue-green	
3	Gray	Blue-white	
4	Purple-gray	Black	
5	Light green	Blue-green	
6	Light green	Blue-green	Current color

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES



SAMPLE ID: MJL-9
SAMPLE LOCATION: Rear porch, second floor level, door frame (river side of door).


Reflected Light, 100X Magnification

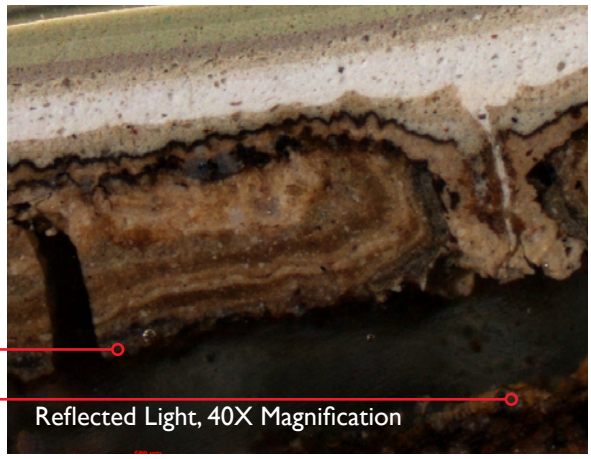

UV Light, 100X Magnification

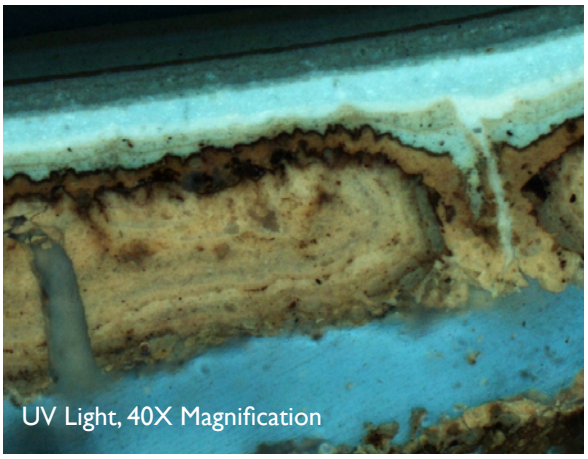
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Light yellow-cream	White-green	20th Century
2	Yellow-cream	Green	
3	White	Blue-white	
4	White	Blue-white	
5	Gray	Blue-white	
6	Gray	Blue-white	
7	Purple-gray	Black	
8	Light green	Blue-white	
9	Light green	Blue-white	Current color

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES



SAMPLE ID: MJL-10
SAMPLE LOCATION: Rear porch, second floor level, ceiling board.



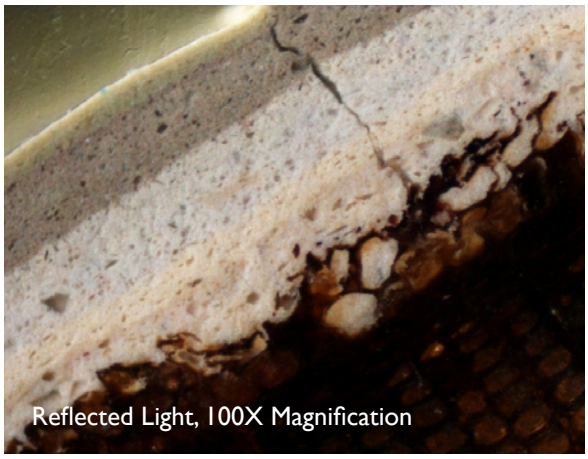


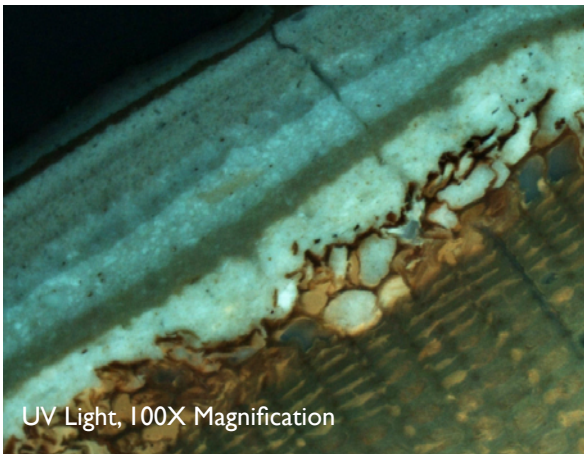
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Cream	Yellow	Earliest existing
2	Gray-green	Blue-yellow	
3	Tan	Yellow	
4	Gold-brown	Yellow	
5	Tan	Yellow	
6	Tan	Yellow	
7	Gold-brown	Yellow	
8	Gray-brown	Yellow	
9	Gold-brown	Yellow	
10	Warm tan	Yellow	
11	Tan	Yellow	
12	Gray-cream	Blue-green	
13	Gray-cream	Yellow	
14	White	White-blue	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	White	Blue-white	
17	Lt Gray	Blue	
18	Gray-tan	Blue	
19	Purple-gray	Blue	
20	Purple-gray	Black	
21	Lt green	Blue	
22	Lt green	Blue	
23	Lt green	Blue	Current color



SAMPLE ID: MJL-11
SAMPLE LOCATION: Rear porch, second floor level, window on the lake side of door, frame.


Reflected Light, 100X Magnification

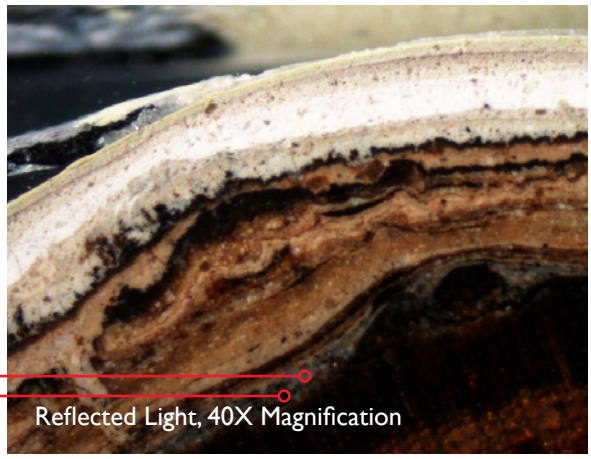

UV Light, 100X Magnification

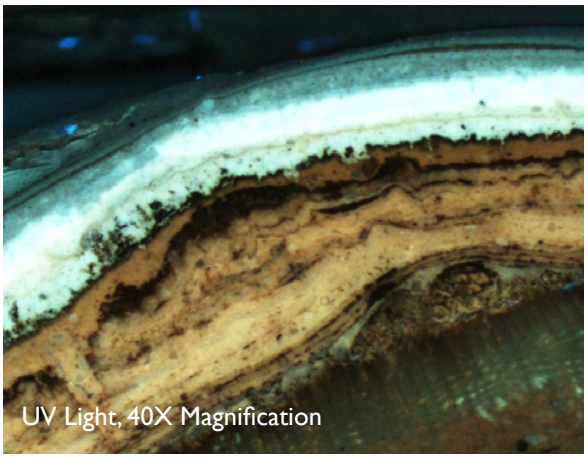
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Cream	Blue-white	20th Century
2	Yellow-cream	Green	
3	Gray-white	Blue-white	
4	Gray-white	Blue-white	
5	Warm gray	Blue-white	
6	Gray	Blue-white	
7	Purple-gray	Black	
8	Light green	Blue-white	
9	Light green	Blue-white	Current color

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES



SAMPLE ID: MJL-12
SAMPLE LOCATION: Rear porch, ceiling joist.



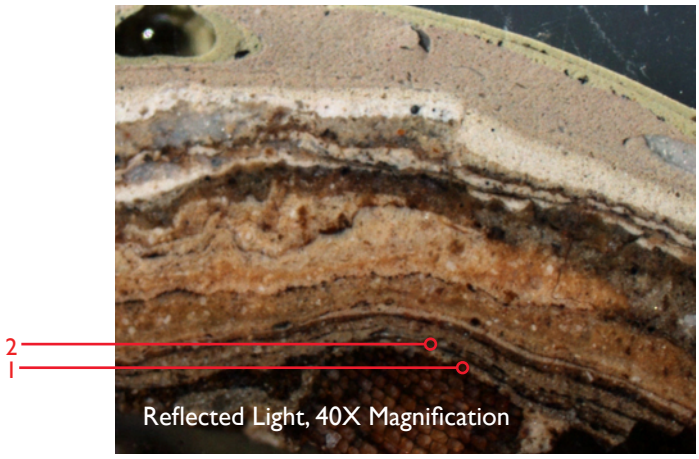


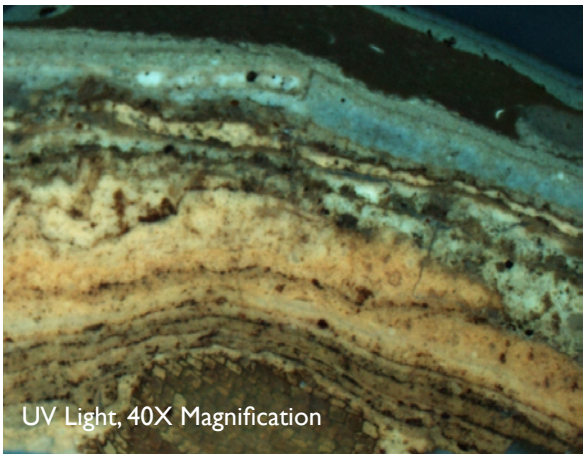
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Cream	Yellow	Earliest existing
2	Gray-green	Blue-yellow	1st unified campaign
3	Tan	Yellow	
4	Cream	Yellow	
5	Brown	Yellow	
6	Cream	Yellow	
7	Tan	Yellow	
8	Brown	Yellow	
9	Tan	Yellow	
10	Gold-brown	Yellow	
11	Cream	Yellow	
12	Cream	Yellow	
13	Gold-brown	Yellow	
14	Tan	Blue-green	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	Cream	Blue-green	
16	Cream	White-blue	
17	White	White-blue	
18	Cream	White-blue	
19	Gray	Blue-gray	
20	Purple-gray	Blue-gray	
21	Gray	Blue-gray	
22	White	Blue-gray	
23	Light green	Blue-gray	
24	Light green	Blue-gray	Current color



SAMPLE ID: MJL-13
SAMPLE LOCATION: Front porch, second floor level, rafter above bracket at river end of porch.



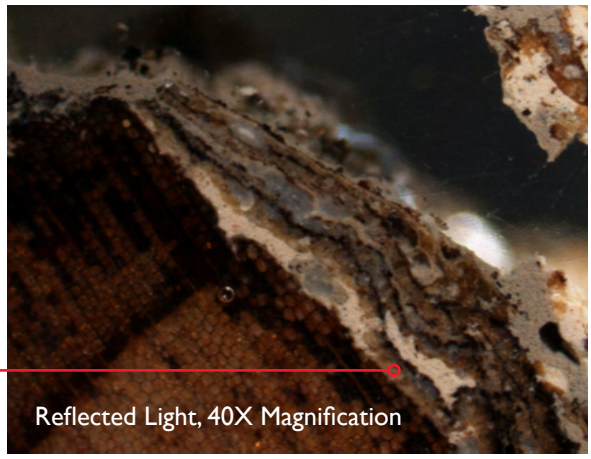


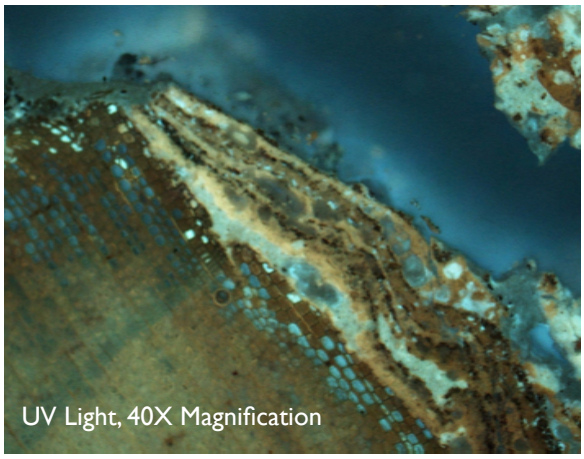
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Cream	Yellow	Earliest existing
2	Gray-green	Yellow-gray	1st unified campaign
3	Brown	Yellow	
4	Brown-cream	Yellow	
5	Brown-tan	Yellow	
6	Cream	Yellow	
7	Gold-brown	Yellow	
8	Gold-brown	Yellow	
9	Cream	Yellow	
10	Gold	Yellow	
11	Cream	Yellow	
12	Tan	Yellow	
13	Dark tan	Yellow	
14	Cream	Yellow	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	Gray	Yellow	
16	White	Yellow	
17	Tan	Blue-white	
18	Gray	Blue-white	
19	Cream	Yellow	
20	Gray-tan	Blue	
21	Gray	Blue	
22	Cream-white	Blue	
23	Yellow-tan	Blue	
24	Gray-purple	Black	
25	Gray-purple	Black	
26	Light green	Blue	
27	Light green	Blue	Current color



SAMPLE ID: MJL-14
SAMPLE LOCATION: Front porch, second floor level, river side window, frame.



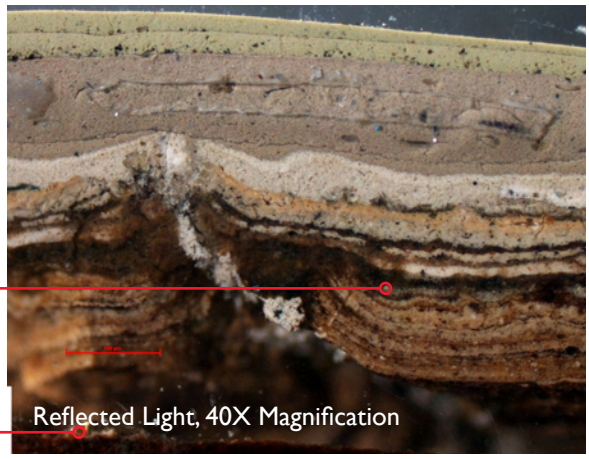


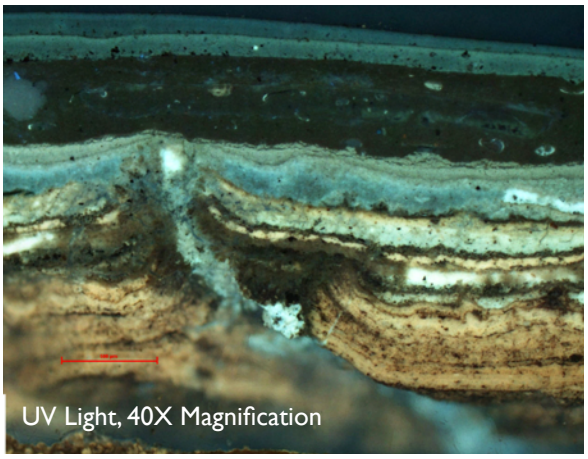
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Gray-green	Brown	Earliest existing
2	Cream	Blue-white	
3	Gold	Yellow	
4	Light gray	Brown	
5	Gray-cream	Brown	
6	Gray-cream	Yellow	
7	Cream	Yellow	
8	Cream	Yellow	
9	Gray-cream	Yellow	
10	Gold-brown	Yellow	
11	Yellow-cream	Blue-white	
12	Yellow	Blue-white	
13	Light Yellow	Blue-white	
14	Yellow-tan	Blue-white	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	Gray-white	Blue-white	
16	Lt warm gray	Blue-white	
17	Lt warm gray	Blue-white	
18	Purple-gray	Black	
19	Purple-gray	Blue-white	
20	Light green	Blue-white	
21	Light green	Blue-white	
22	Light green	Gray	



SAMPLE ID: MJL-15
SAMPLE LOCATION: Front porch, second floor level, bracket at river end of porch.



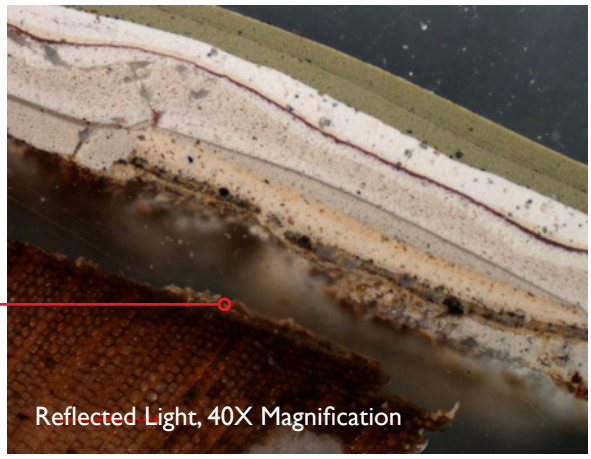


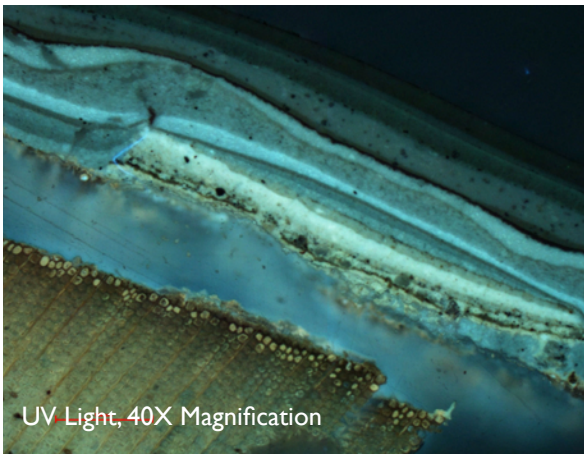
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Brown	Brown	Earliest existing
2	Gold-brown	Yellow	
3	Cream	Yellow	
4	Gold-brown	Yellow	
5	Gold-brown	Yellow	
6	Cream	Yellow	
7	Gray-cream	Yellow	
8	Cream	Yellow	
9	Gold-brown	Yellow	
10	Cream	Yellow	
11	Cream	Yellow	
12	Cream	Yellow	
13	Yellow-cream	Yellow	
14	Cream	Yellow	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	Gold-brown	Yellow	
16	Cream	Yellow	
17	Gray-green	Blue-white	1st unified campaign
18	Gray	Blue-white	
19	White	Yellow	
20	Lt gray	Blue-white	
21	Lt yellow	Yellow-grn	
22	Lt gray	Blue	
23	White	Blue	
24	Gray	Blue	
25	Gray	Blue	
26	Gray	Black	
27	Gray	Black	
28	Lt green	Blue	
29	Lt green	Blue	Current color



SAMPLE ID: MJL-16
SAMPLE LOCATION: Front porch, second floor level, top of third clapboard from ceiling, adjacent to river side window.



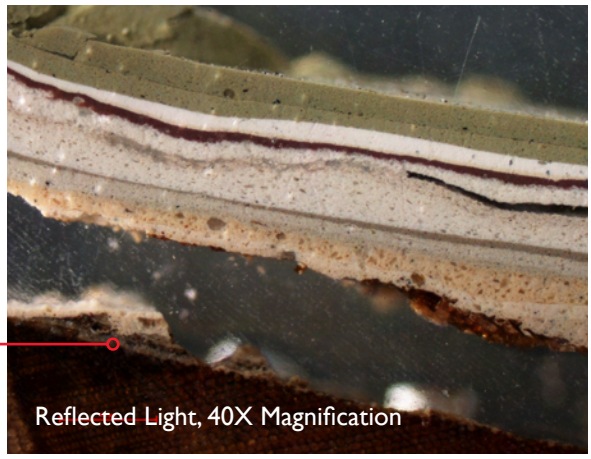


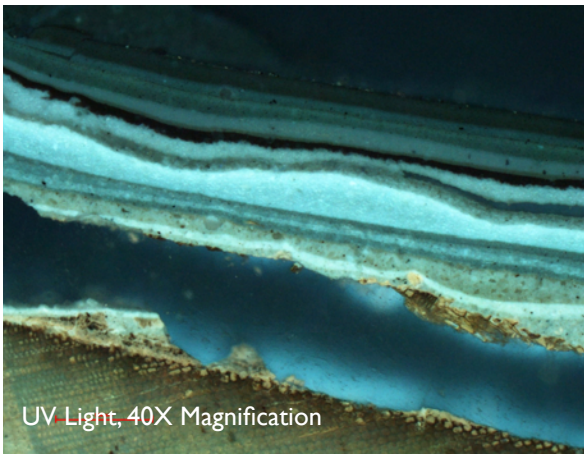
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Gray-green	Brown	Earliest existing
2	Red-brown	Yellow	
3	Yellow-cream	Blue-green	
4	Gray-tan	Blue-green	
5	Cream	Blue-green	
6	Light yellow	Blue-green	
7	Light gray	Blue-white	
8	Warm lt gray	Blue-white	
9	Dk gray	Blue-white	
10	White	Blue-white	
11	Gray-cream	Blue-white	
12	White	Blue-white	
13	Cool red	Blue-white	
14	Yellow	Blue-white	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	White	Blue-white	
16	Lt green	Blue-white	
17	Lt green	Gray	
18	Lt green	Gray	Current color



SAMPLE ID: MJL-17
SAMPLE LOCATION: Front porch, second floor level, river end clapboard below ledger that supports joist.



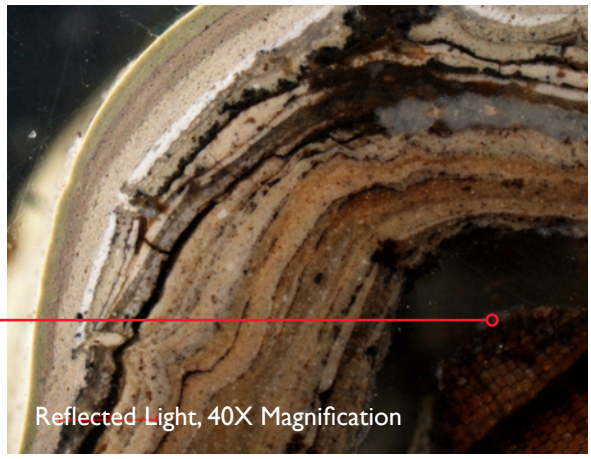


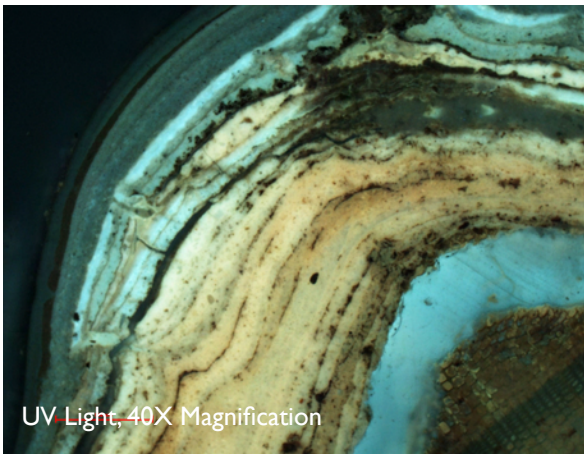
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Gray-green	Blue-green	Earliest existing, partial
2	Dark-gray	Blue-white	Partial
3	Cream	Blue-green	Partial
4	Gray	Blue-green	Partial
5	Yellow-cream	Blue-green	
6	Cream	Blue-green	
7	Yellow	Blue-green	
8	Gray	Blue	
9	Light gray	Blue-white	
10	Gray	Blue	
11	Purple-gray	Blue	
12	White-gray	Blue	
13	Gray	Blue-white	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
14	Red	Black	
15	Lt yellow	Gray	
16	White	Blue	
17	Lt green	Blue	
18	Lt green	Gray	Current color



SAMPLE ID: MJL-18
SAMPLE LOCATION: Front porch, second floor level, ceiling board near river end of porch.



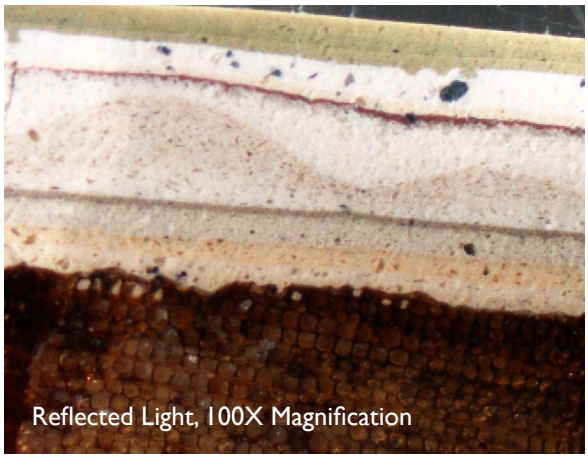


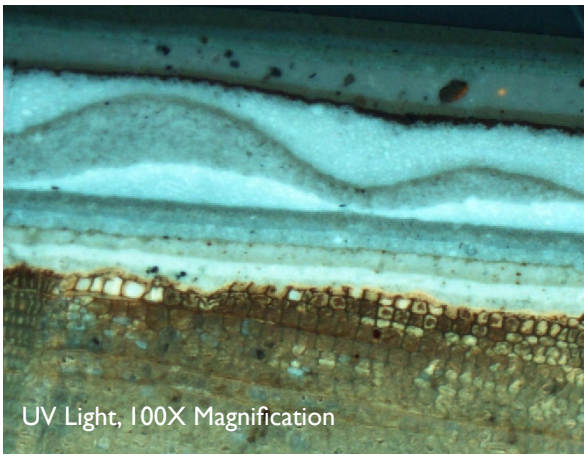
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Gray-green	Yellow	Earliest existing
2	Cream	Yellow	
3	Gray	Yellow	
4	Gray	Yellow	
5	Cream	Yellow	
6	Cream	Yellow	
7	Yellow-cream	Yellow	
8	Yellow-cream	Yellow	
9	Tan	Yellow	
10	Cream	Yellow	
11	Yellow	Yellow	
12	Yellow-cream	Yellow	
13	White-gray	Yellow	
14	Cream	Yellow	

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
15	White	Blue-white	
16	White-gray	Yellow	
17	Cream	Yellow	
18	Cream	Blue-white	
19	White	Blue-white	
20	Gray	Blue-white	
21	Gray	Blue-white	
22	White	Blue-white	
23	Lt gray	Blue-white	
24	Gray	Blue-white	
25	Purple-gray	Blue-white	
26	Lt green	Blue-white	
27	Lt green	Blue-white	Current color



SAMPLE ID: MJL-19
SAMPLE LOCATION: Front porch, second floor level, clapboard under joist ledger.


Reflected Light, 100X Magnification

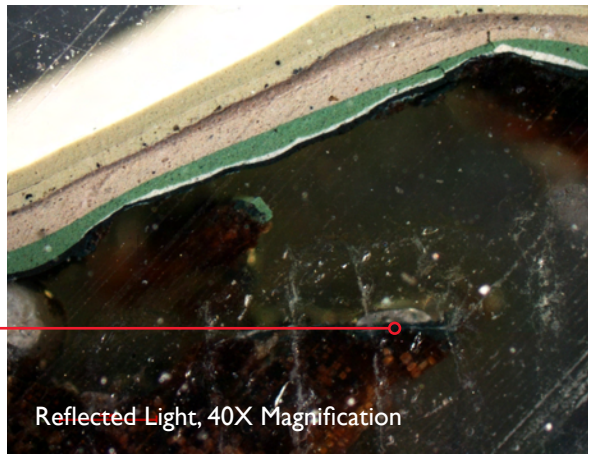

UV Light, 100X Magnification

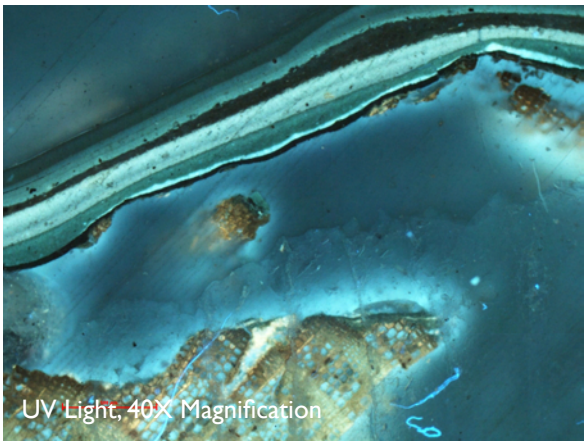
LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Yellow-cream	Yellow-white	20th Century
2	Yellow-cream	Yellow-white	
3	Yellow-cream	Yellow-white	
4	Off-white	Blue-green	
5	Gray	Blue-green	
6	Off-white	Blue-green	
7	Light gray	Blue-green	
8	White	Blue-green	
9	Red	Black	
10	Yellow-cream	Blue-green	
11	White	Blue-green	
12	Light green	Blue-green	
13	Light green	Gray	
14	Light green	Gray	Current color

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES



SAMPLE ID: MJL-20
SAMPLE LOCATION: Front porch, second floor level, window shutter at river end.





LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES
WOOD			
1	Dark green	Blue-green	Earliest existing
2	White	Blue-white	
3	Dark green	Black	
4	White	Blue-white	
5	Green	Blue-green	
6	Green	Blue-green	
7	Tan	Blue-white	
8	Tan	Blue-white	
9	Gray	Blue-white	
10	Dark gray	Black	
11	Light green	Blue-white	
12	Light green	Blue-white	
13	Light green	Blue-white	Current color

LAYER	REFLECTED LIGHT COLOR	AUTO-FLORESCENCE	NOTES