Current Research in Historic Preservation

Session Three ▸ 11:00 – 11:45

GRADUATE PROGRAM IN HISTORIC PRESERVATION

CLEMSON UNIVERSITY

COLLEGE of CHARLESTON

Claire Achtyl

State Historic Preservation Conference

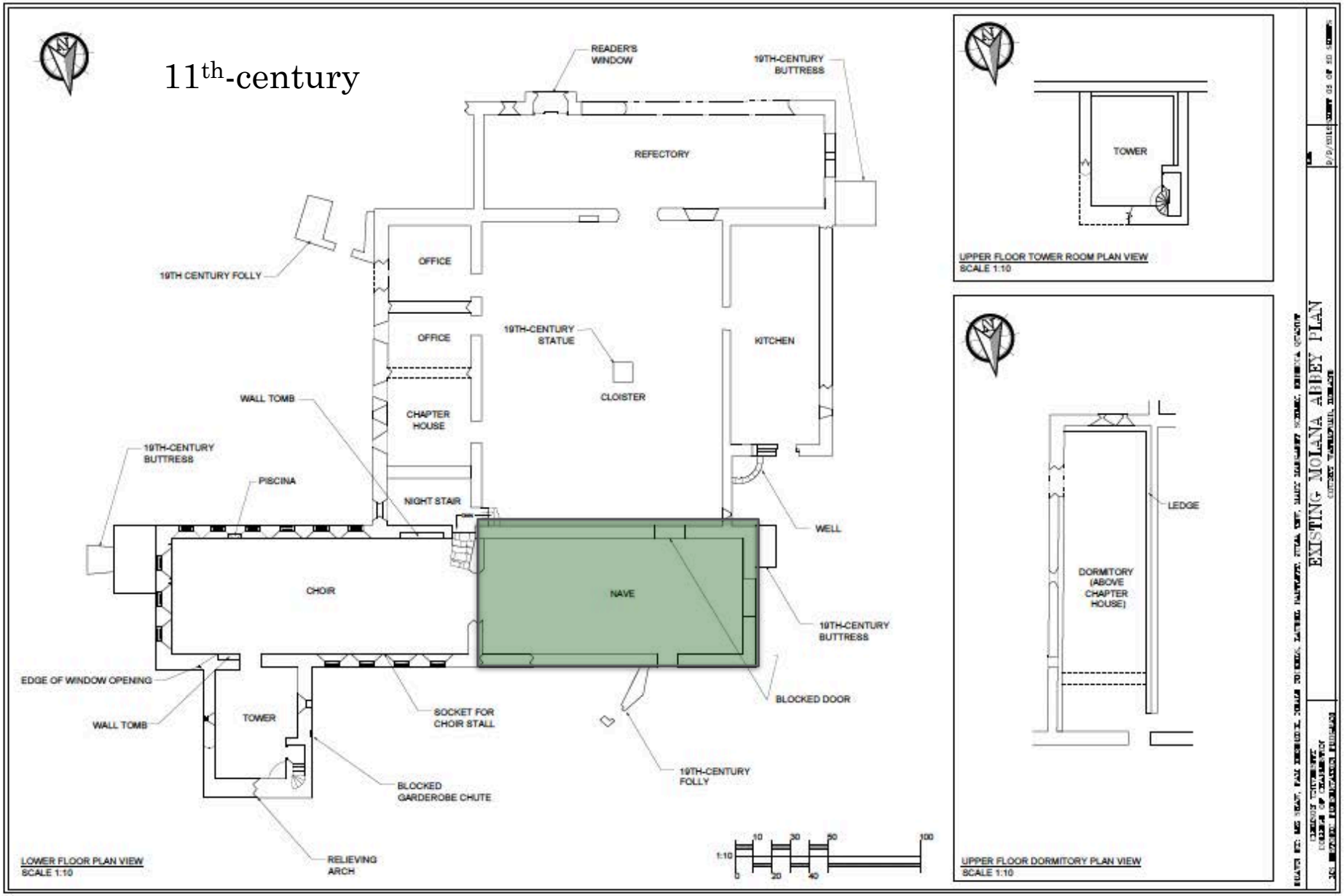
The Structural and Material Evolution of Molana Abbey, Ballynatray Demesne, County Waterford, Ireland, Site WA037-011: A Mortar Composition Comparative Study

The thesis analyzed the material composition of mortar samples taken from the surviving medieval walling and later repairs at Molana Abbey, in County Waterford, Ireland.

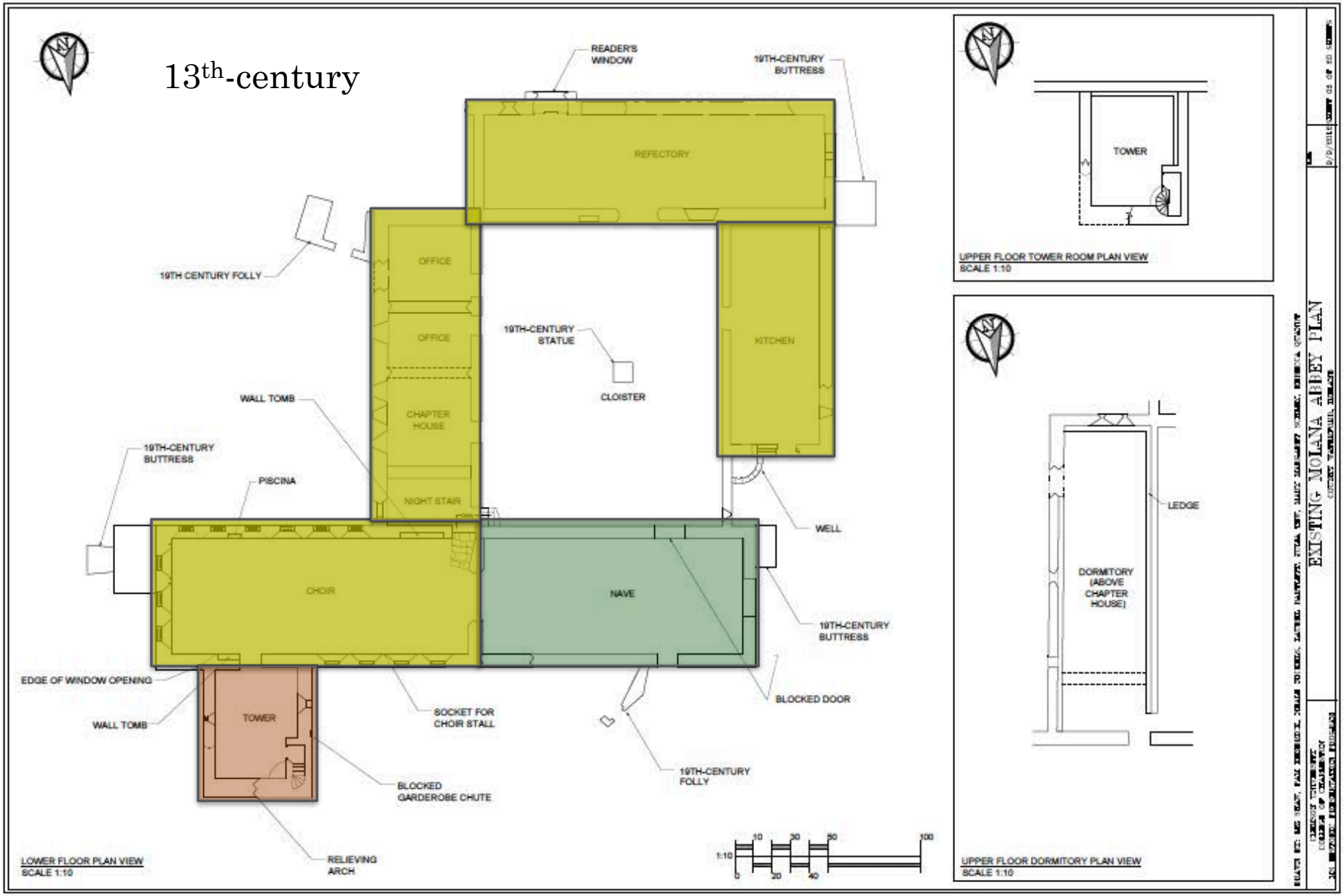
The intent of conducting mortar sample analysis is to define the building campaigns of Molana Abbey from the eleventh to the nineteenth century

Ireland
Irish Sea
Dublin
Muir Cheilteach
St George's Channel
Cambrian Mounta

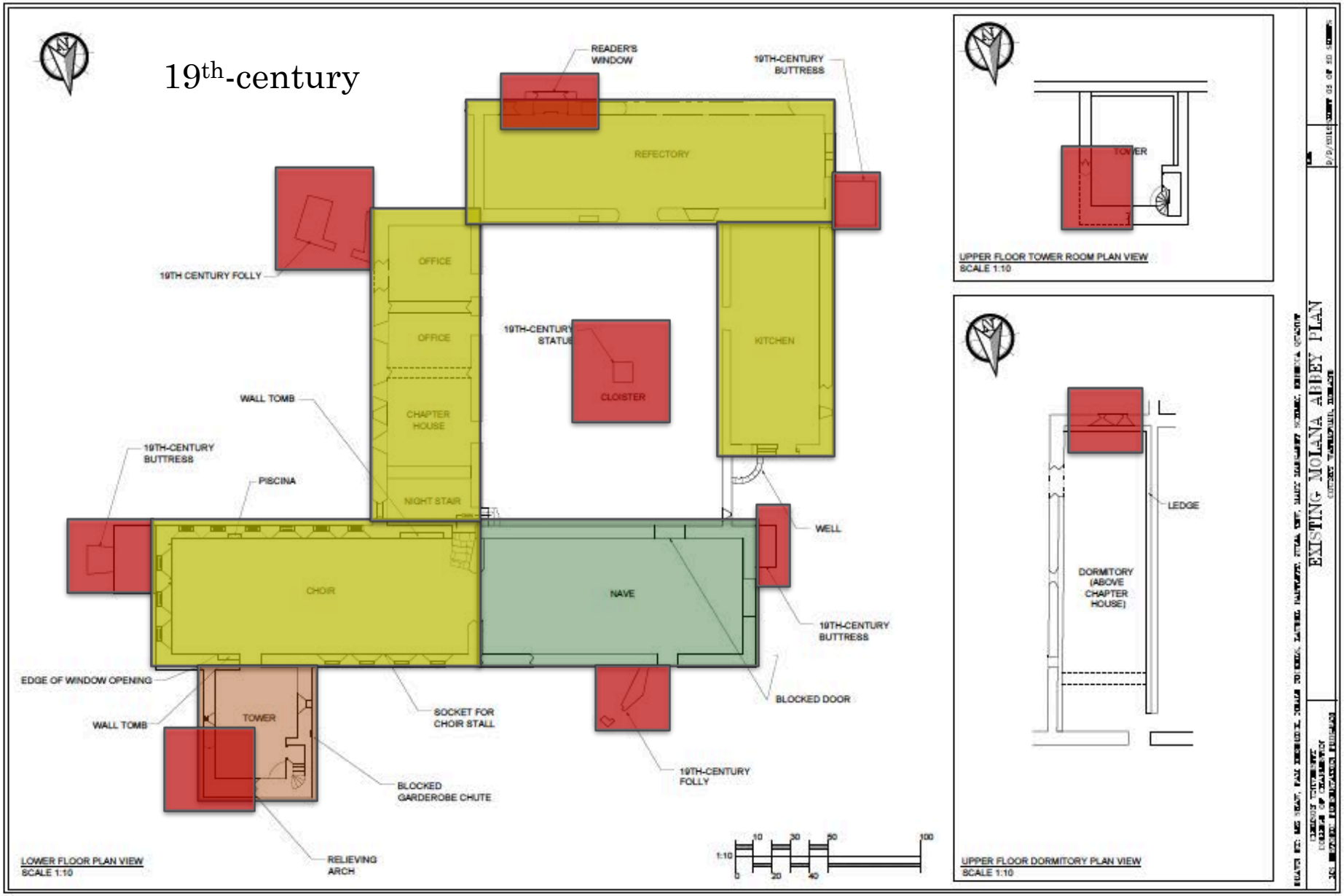
11th-century

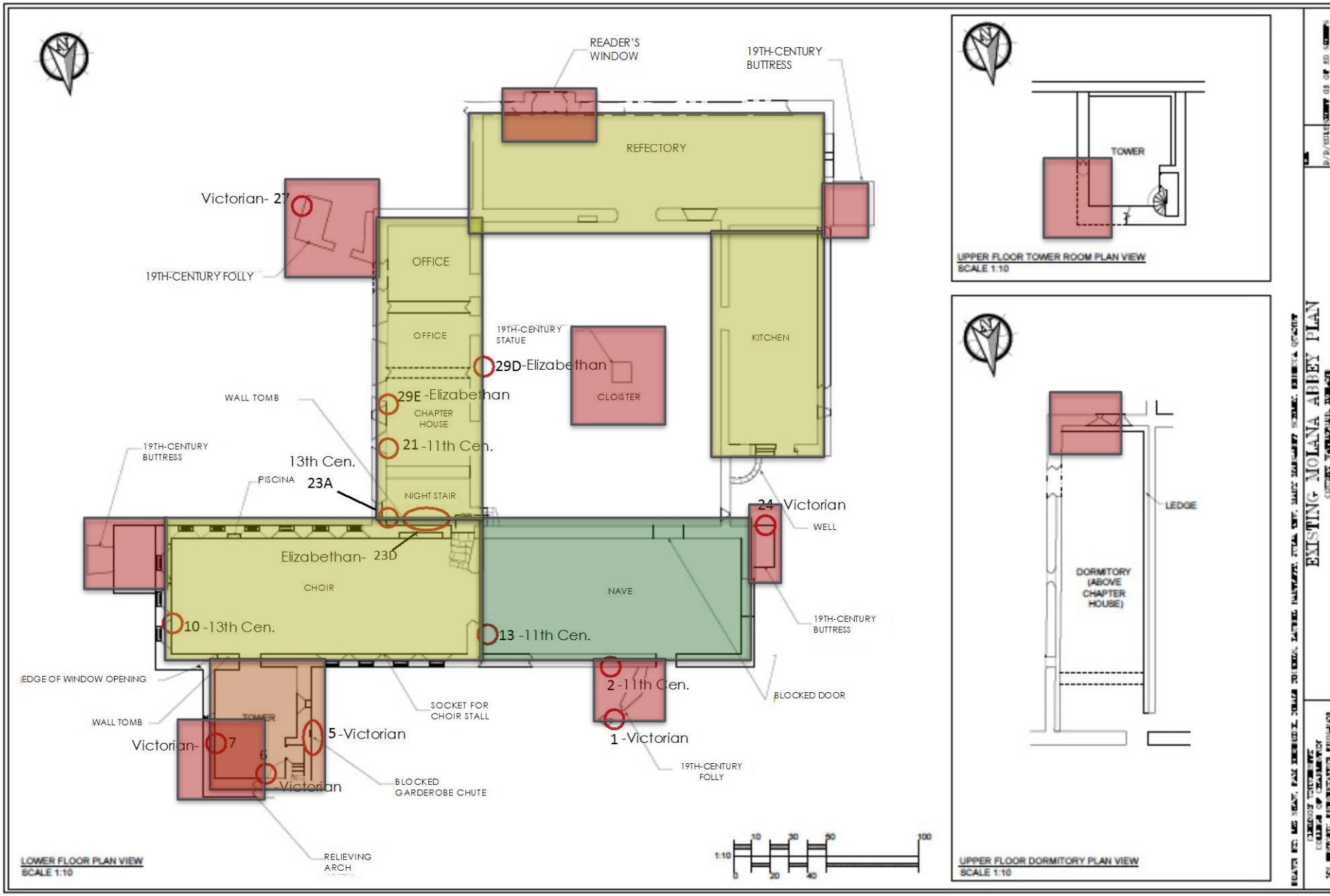


13th-century



19th-century



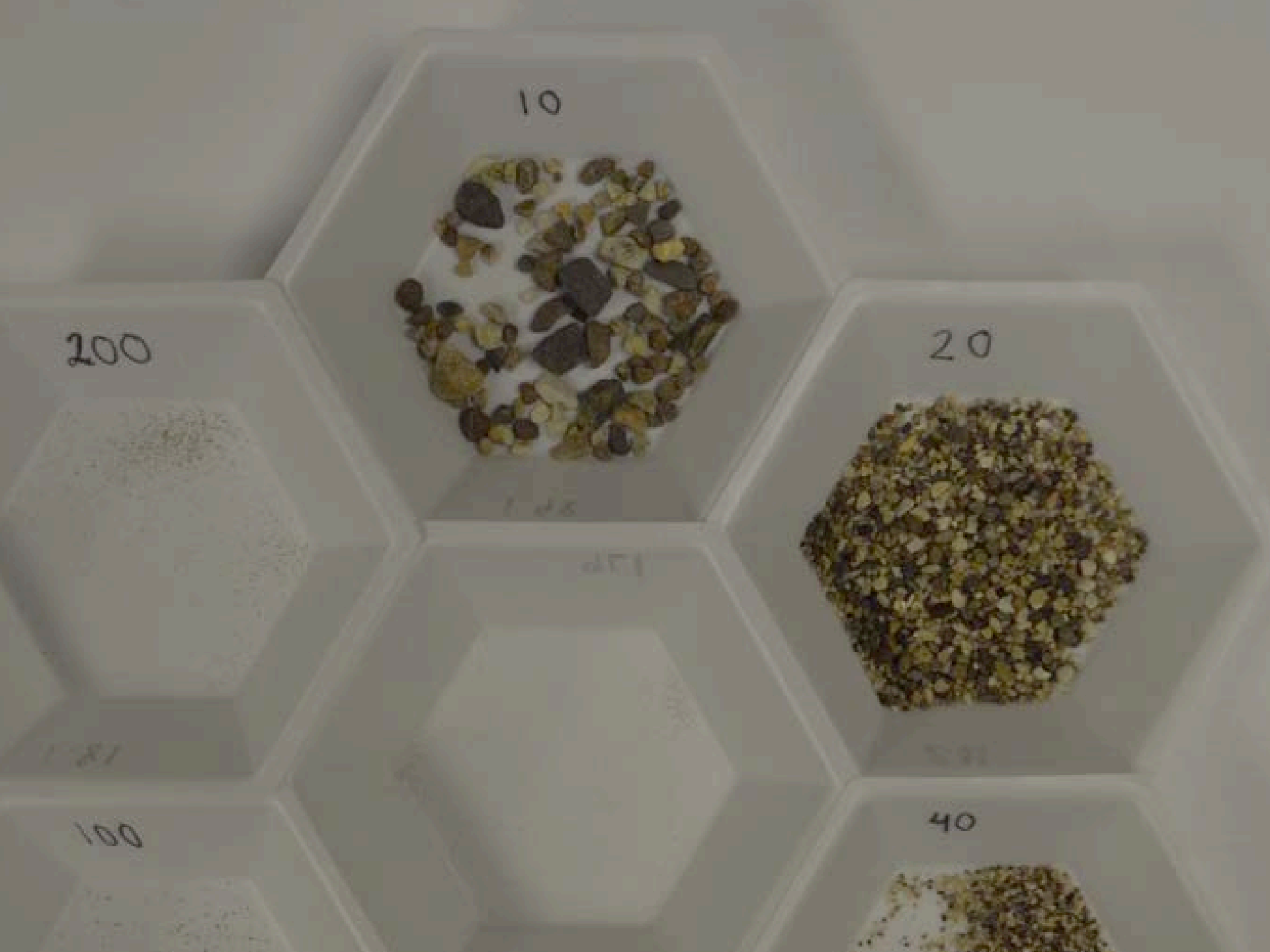

READER'S WINDOW
19TH-CENTURY BUTTRESS
REFECTORY
Victorian- 27
19TH-CENTURY FOLLY
OFFICE
OFFICE
19TH-CENTURY STATUE
29D-Elizabethan
29E -Elizabethan
CHAPTER HOUSE
CLOISTER
KITCHEN
WALL TOMB
21 -11th Cen.
19TH-CENTURY BUTTRESS
13th Cen.
PISCINA
23A
NIGHT STAIR
24 Victorian
WELL
Elizabethan- 23D
CHOIR
NAVE
10 -13th Cen.
13 -11th Cen.
19TH-CENTURY BUTTRESS
EDGE OF WINDOW OPENING
2 -11th Cen.
BLOCKED DOOR
SOCKET FOR CHOIR STALL
WALL TOMB
TOWER
5 -Victorian
Victorian- 7
6
Victorian
1 -Victorian
19TH-CENTURY FOLLY
BLOCKED GARDEROBE CHUTE
RELIEVING ARCH
LOWER FLOOR PLAN VIEW
SCALE 1:10
1:10
0 10 20 30 40 50 100
TOWER
UPPER FLOOR TOWER ROOM PLAN VIEW
SCALE 1:10
LEDGE
DORMITORY (ABOVE CHAPTER HOUSE)
UPPER FLOOR DORMITORY PLAN VIEW
SCALE 1:10
EXISTING MOLANA ABBEY PLAN

Analytical Method

- Chemical (Gravimetric)
- Microstructural (optical microscopy)
- Elemental-SEM-EDS and XRF (Scanning Electron Microscope-Energy Dispersive Spectroscopy, X-Ray Fluorescence)

From Gravimetric Analysis..

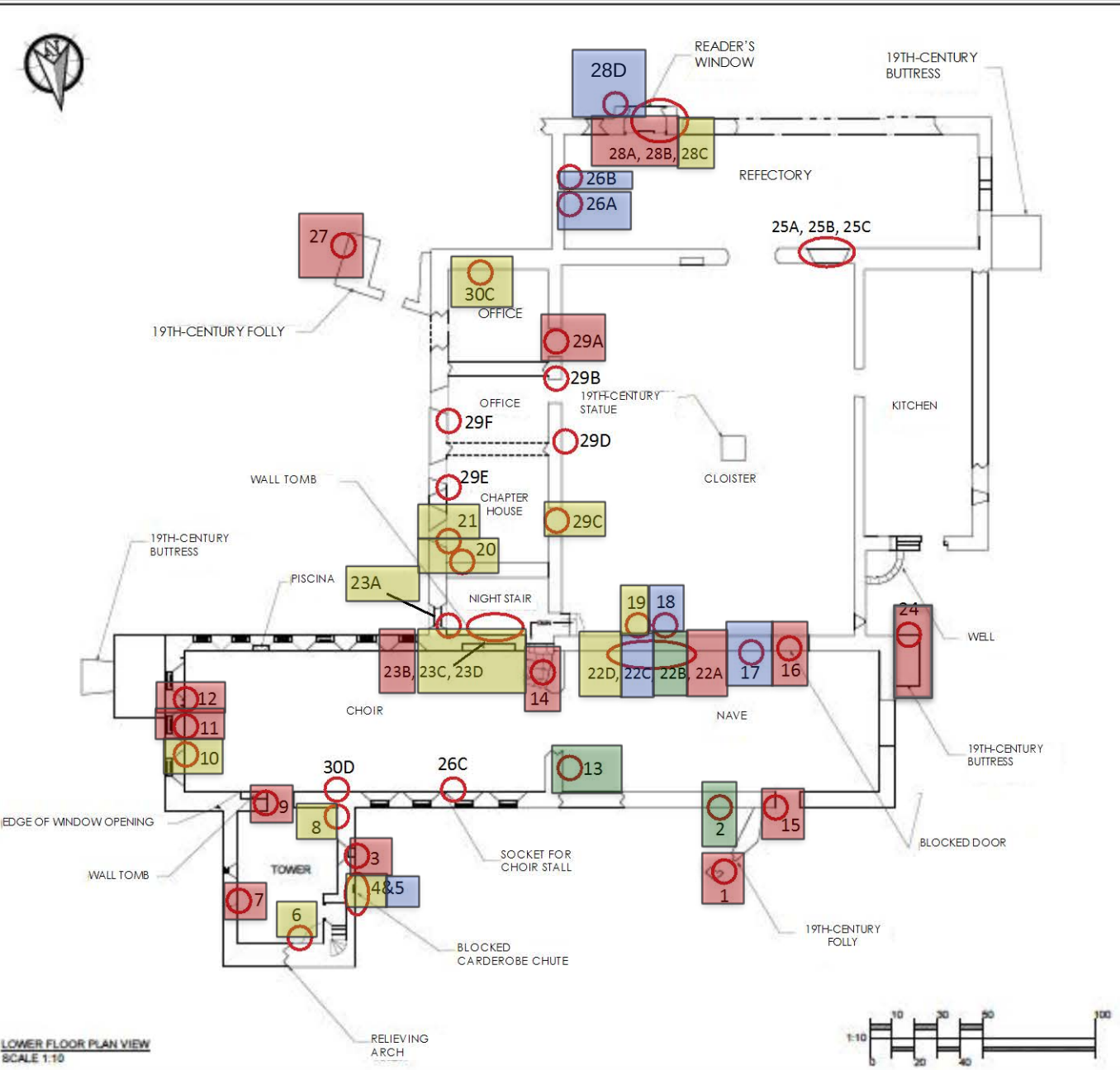
- Characteristics considered after analysis-
  - Lime Content
  - Aggregate type
  - Fines

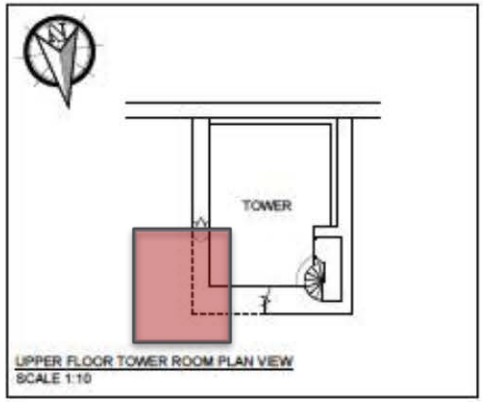

10
200
20
100
40

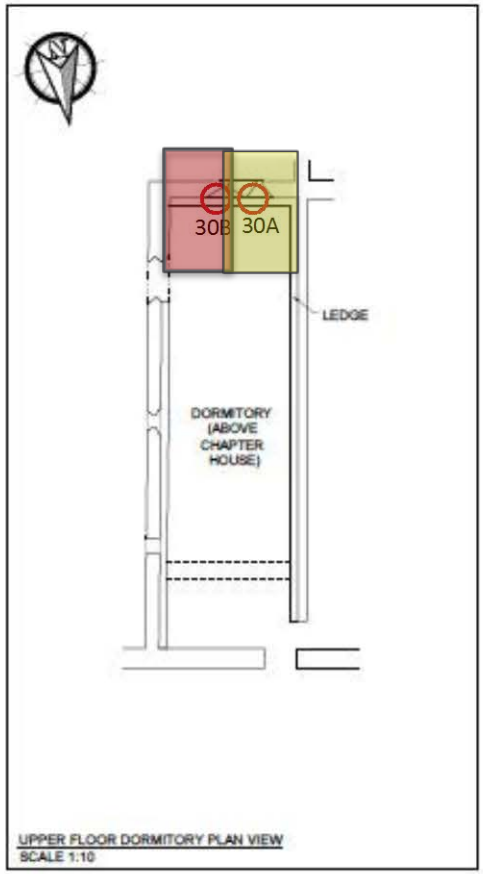
Comparative Analysis

- Lime Content
- Fine Color

Add XRF Results







EXISTING MOLANA ABBEY PLAN

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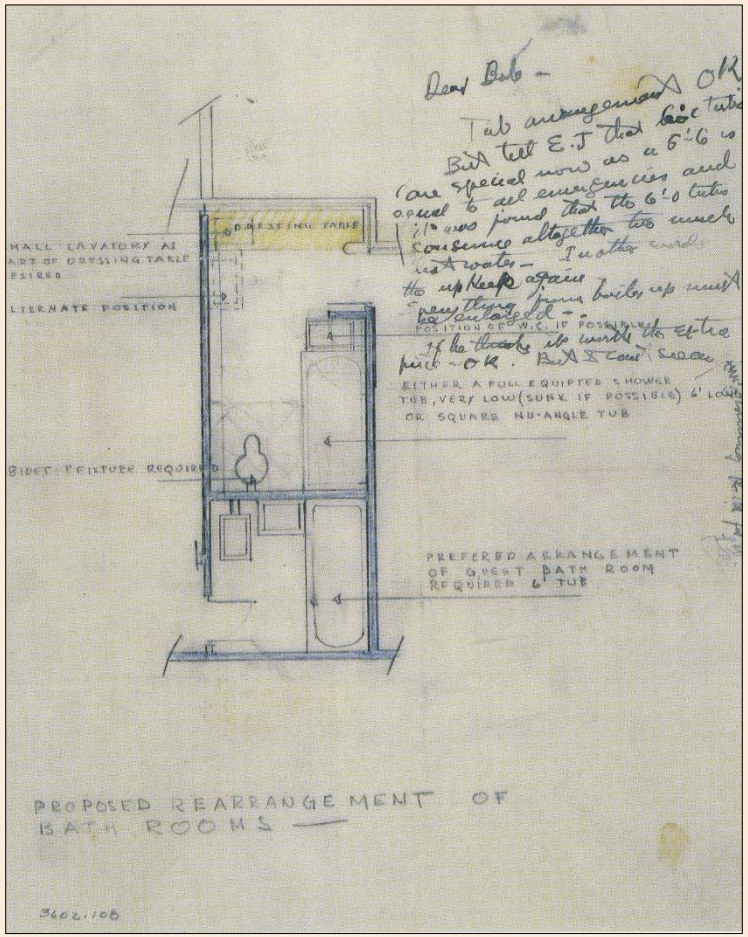
Amber Anderson

The Analysis of a Secondary Space:
Bathrooms at Frank Lloyd Wright's Fallingwater

Amber M. Anderson

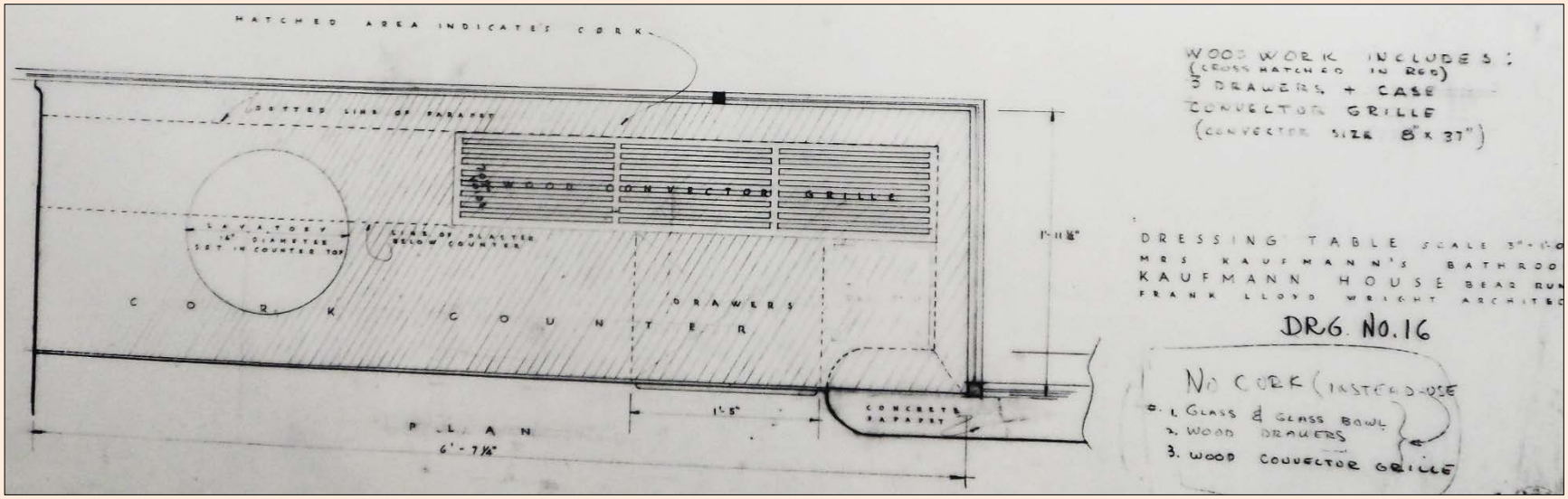
Methodology

- Thesis Question:
  - *"How does an understanding of the original conception of the secondary spaces at Fallingwater and the post-construction treatment of these spaces inform a reexamination of their significance and treatment today?"*



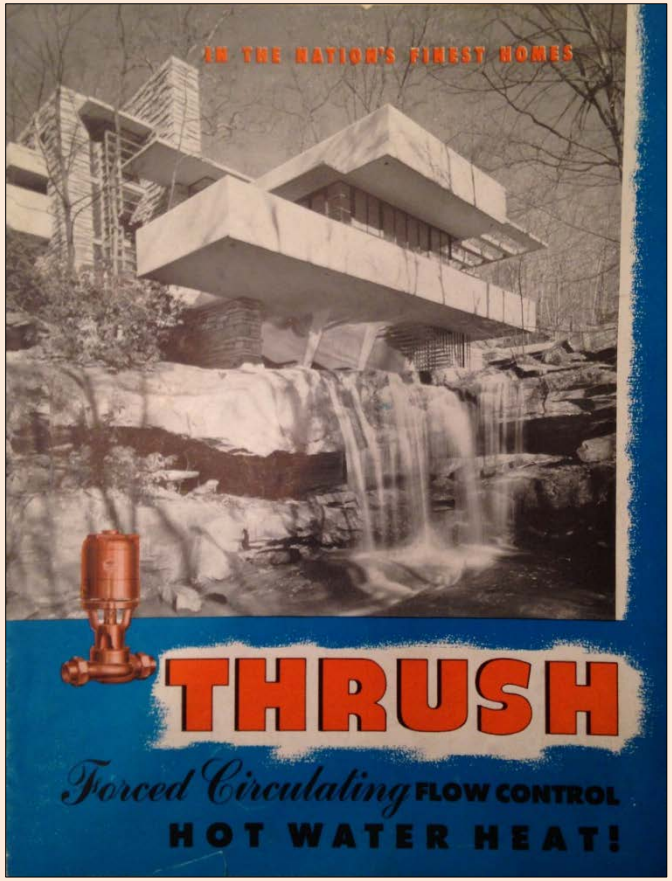
Findings: Significance

- Bathroom design largely determined by the Kaufmanns
  - Wright's flexibility & apprentices' role
  - Detailed plans & specifications
  - High number of design iterations
  - Large body of correspondence on the subject



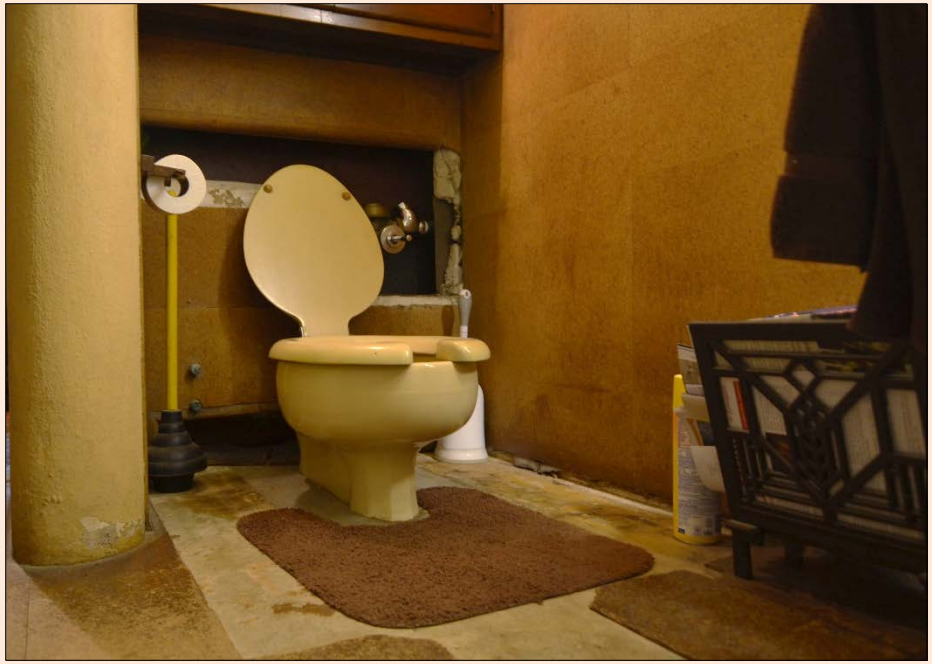
Findings: Significance

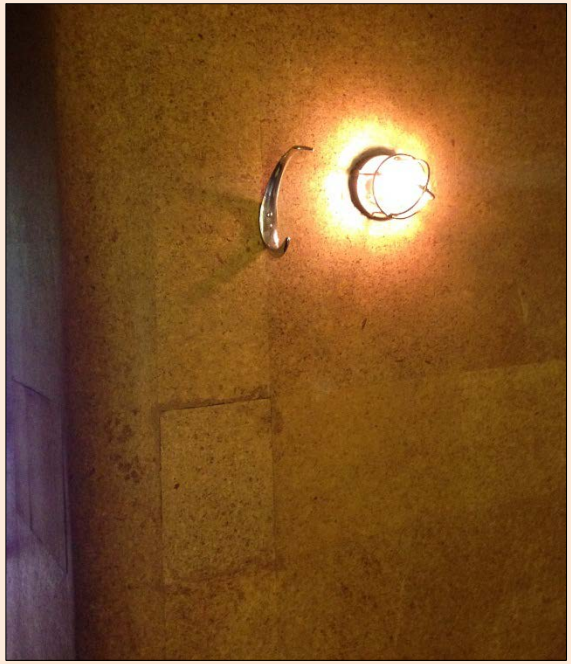
- Fallingwater's bathrooms represent early twentieth-century technological and cultural innovations and trends
  - Outward expressions of character-defining historic systems
  - Use of novel features
  - Early adopters & promoters of commercial products and name brands
  - Advocates of the Sanitation Age



Findings: Guidance & Treatment

- Lack of consistent guidance at the national level
- Lack of, or improper, guidance at the institutional level
  - Loss of historic fabric & design integrity
  - Recent shift towards best practice





Recommendations & Wider Applications

- Conduct similar assessments of significance & integrity
- Balance function & retention of fabric/design
- Consistent policies

Thank You

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Shannon Devlin

“Nine Mahogany Tables…Two Marble Slabbs and Stands…And a Cow”:

The First Generation Furniture of Drayton Hall

Shannon Devlin

The Furniture

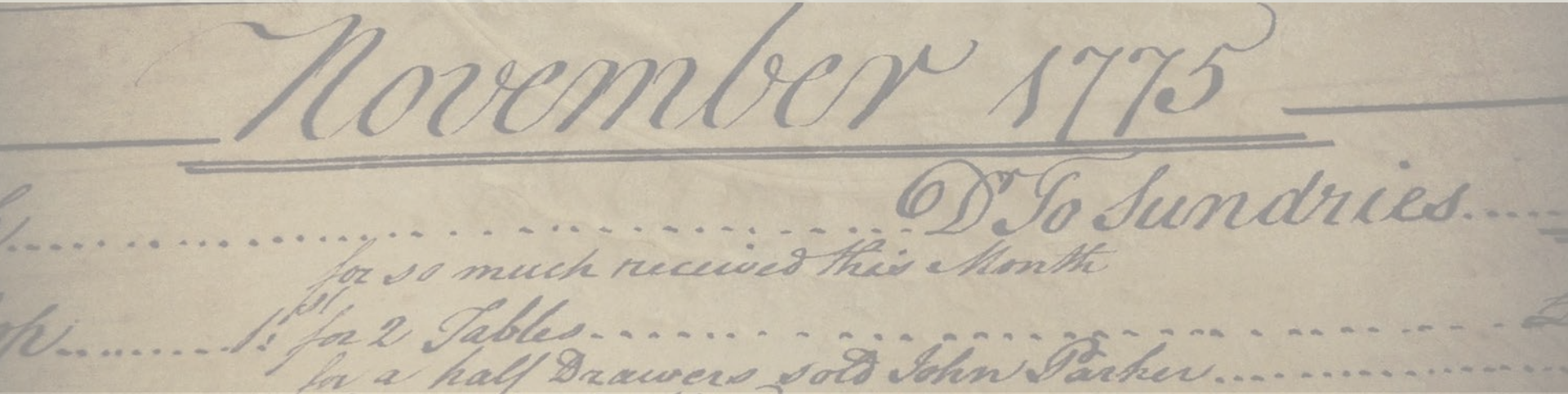
- John Drayton's taste
- Solidified spatial delineation with imported and Charleston-made furniture
- Re-decorating campaigns by John Drayton

A Refined Taste:
John Drayton's Imported Furniture

- Formally defined spaces
- Matched architecture in terms of style, quality, and fashion
- Importance of suite and early date
- Glen, Grendey, and Larch point to London

For a Breakfast Table: John Drayton's Charleston Furniture

- Less formal, family spaces
- Ordinary items
- Glimpse into other Drayton Hall furniture
- Analysis places Drayton as top Elfe customer



Significance

- Representative of the importance of collections at Drayton Hall
- Holistic public interpretation
- Reevaluate, Dedicate, Exhibit, and Acquire

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Jacqueline Don

"A Posture of Defence":

Exploring the Evolution of Charleston's Seventeenth and Eighteenth Century Walled Fortifications through Forensic Brick Analysis

Jacqueline Don

Clemson University/ College of Charleston Graduate Program in Historic Preservation

April 2015

Thesis Goals

The goal of this study was to determine if current analytical techniques used in brick sourcing could identify periods of rebuilding or repair in Charleston's seventeenth and eighteenth century walled fortifications by discerning patterns of composition in brick samples.

Some of the specific questions this thesis addressed were:

- Where were the sea wall bricks being made?
- Were bricks from different sources identified in the same location?
- Were there notable differences in bricks collected from higher than lower in the wall?
- Were the foundations of the fortifications reused after demolition?

Brick Samples and Methods

- The analytical method focuses on chemical, mineral, and physical analysis of bricks to determine a source of origin
- 9 Brick samples were collected from the walled fortifications
- 12 Brick samples were collected from local historic sites whose construction dates corresponded with time periods of the wall's use.
- Sites: Colonial Dorchester State Historic Site, Powder Magazine, and Drayton Hall
- The brick sample set was analyzed using X-ray fluorescence, X-ray diffraction, colorimetry, and water absorption

Overall Findings

- Overall, the samples appear to come from the same geologic region
- Two sub categories with one outlier could be distinguished in the analysis of both XRF and XRD results
- Two distinct color groups: orange and red and “gray”, red-brown bricks
- Porosity range is similar for almost all samples and is relatively low for historic bricks
- Results may be skewed due to the fact that not all bricks are whole samples
- One outlier: Missroon Basement
  - *Calcium, Anorthite, lower silica percent, and porosity*

Analysis

- Two major source composition patterns identified
  - *Ashley River and the Wando River*

- Correlation between sourcing and dates of samples
  - *Ashley- Pre-1740s*
  - *Wando- Post-1740s*

- Increase in economic activity and specialization in the mid-18th century along the Wando River
-
- The quality of early, Ashley River bricks varies more than later, Wando River bricks

- Missroon Basement is from a different source than the other samples

Brick Sources: Wando River and Ashley River

XRD- Group A	Dates	XRD- Group B	Dates2	Outlier
Colonial Dorchester Free School	1758-1760	43 East Bay	c. 1706	Missroon House Basement- c.1808
Colonial Dorchester Powder Magazine	1757	DH 981A	c. 1680	
Colonial Dorchester Lot 52 Foundation Wall	c. 1742	DH 985C	c. 1680	
Colonial Dorchester Lot 7 Riverside Wall	c. 1742	DH 1052B	c.1680	
DH Portico 001	c. 1742	Curtain Wall East Bay	1696-1785	
Powder Magazine N110E102	c. 1713	Half Moon Sample 3	1696-1785	
Powder Magazine N120E115	1713-1750	Granville Bastion	1696-1785	
Powder Magazine N145E110	c. 1713-1795	Parapet S Adger's Wharf	likely post 1740	
Finished Cap Parapet Redan	Likely post 1740	Sea Wall Infill Sample 1	c. 1738-1760s	
Sea Wall Brick King St-S Battery Lower Course	1768- early 19th century			
South Redan top course interior	Likely post 1740			

Conclusions

- Dates and source composition do appear to have a correlation
- Definitive conclusions cannot be made regarding differences in dates between bricks higher and lower in the walled fortifications and in the same location
- The Missroon Basement sample does not appear to be a reused brick from the fortifications
- Differences in building periods could only be generalized
- Analytical tools provided broad patterns
- Until the analytical process is further refined to narrow down provenance in a similar region, more specific rebuilding dates can not be determined
- Can aid in interpretation of a site but documented dates are critical in discerning reliable patterns

Recommendations

- Collect more sources from each area along the wall for more complete comparison of patterns occurring
- Systematic group testing of bricks from same area
- Use of petrography and SEM to identify organic matter and inclusions
- Use of a specialized filter for XRF
- Use of whole brick samples
- Characterization inventory of Charleston made bricks
- Geologic studies focused on clay sources directly related to brick making in the region

Thank You

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Alison Dunleavy

FIFTY SHADES OF BEIGE: COMPARATIVEPAINT ANALYSIS OF THREE CHARLESTON PARLORS

Alison Dunleavy

THE BIG PICTURE

The goal of this paint investigation is to identify the interior finishes of an individual room at three historic Charleston houses in order to study the evolution of each house's decorative trends. A comparative analysis of selected samples from all three buildings provides in-depth information on the pigments and binders used in the finishes and whether wealth played a role in determining the type and quality of paints used in each interior. The findings lead to increased understanding about the individual properties and allow for comparisons between buildings.

THE PARLORS

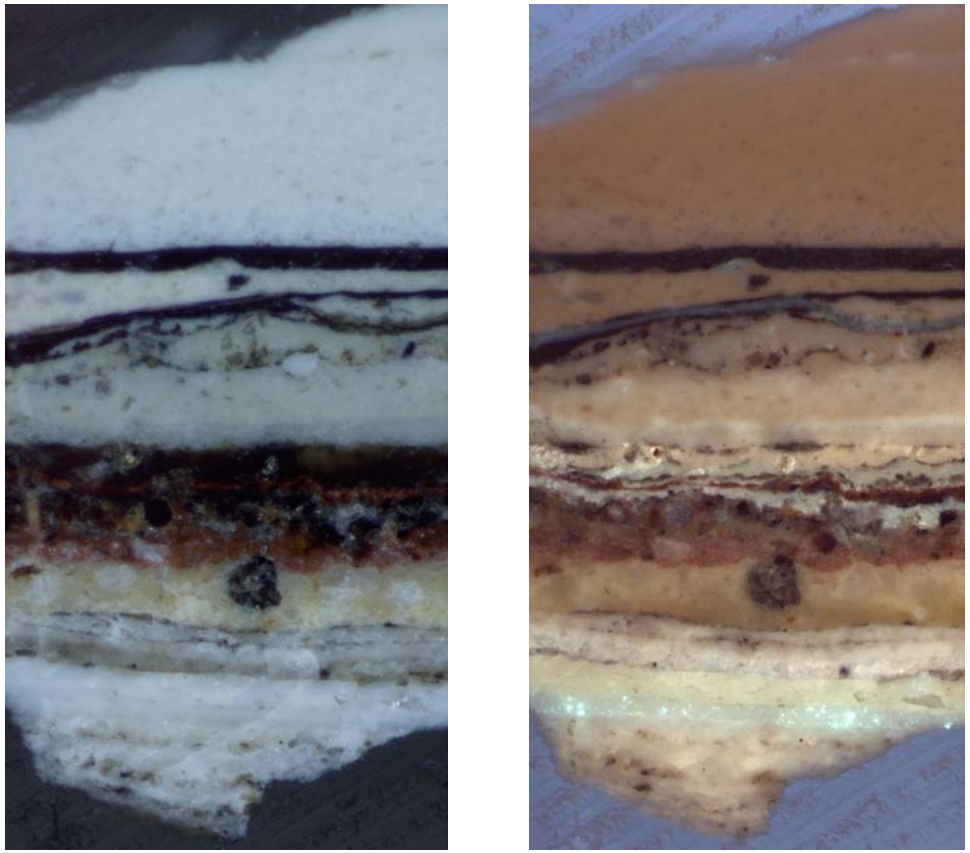
35 Legare Street, ca. 1790

18 Bull Street, ca. 1800

61-63 Smith Street, ca. 1823-24

ANALYTICAL TECHNIQUES

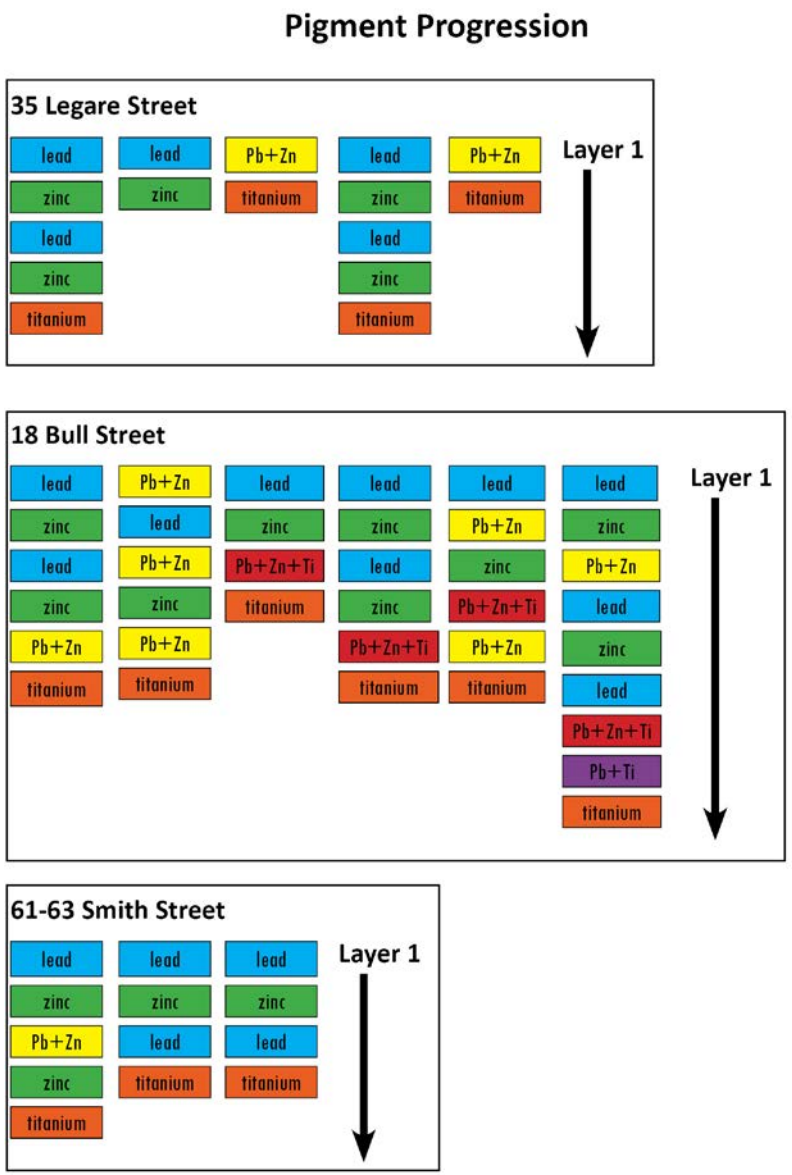
- Cross section microscopy: reflected and ultraviolet light
- Fluorescence microscopy: fluorochrome staining
- Scanning Electron Microscopy: elemental mapping



Baseboard, 61-63 Smith Street, reflected and UV light, 10x

FINDINGS: COMPARATIVE ANALYSIS

- Almost all original finishes were lead-based off white or beige oil paint
- Large difference in average number of layers, number of samples with 20 or more layers, pigment progression
  - 35 Legare street average number of layers per sample: 18
  - 18 Bull Street average number of layers per sample: 23
  - 61-63 Smith Street average number of layers per sample: 11
- Decorative trends share some similarities:
  - 61-63 Smith Street, 18 Bull Street baseboards
  - 35 Legare Street, 61-63 Smith Street window and door surrounds
  - Crown molding in all parlors



CONCLUSIONS

- Unexpected results
  - No distemper, no clear progression
- Characteristics of paint in each parlor evolved simultaneously
  - Pigments, binders, particle size
- Decorative trends: white, off white, beige
- Wealth did not affect quality of paint
- Wealth influenced other aspects of interior finishes
  - Frequency of repainting
  - Surface preparation

Recommendations:

- Widen the survey
- Focus on certain features
- Research on importation of pigments

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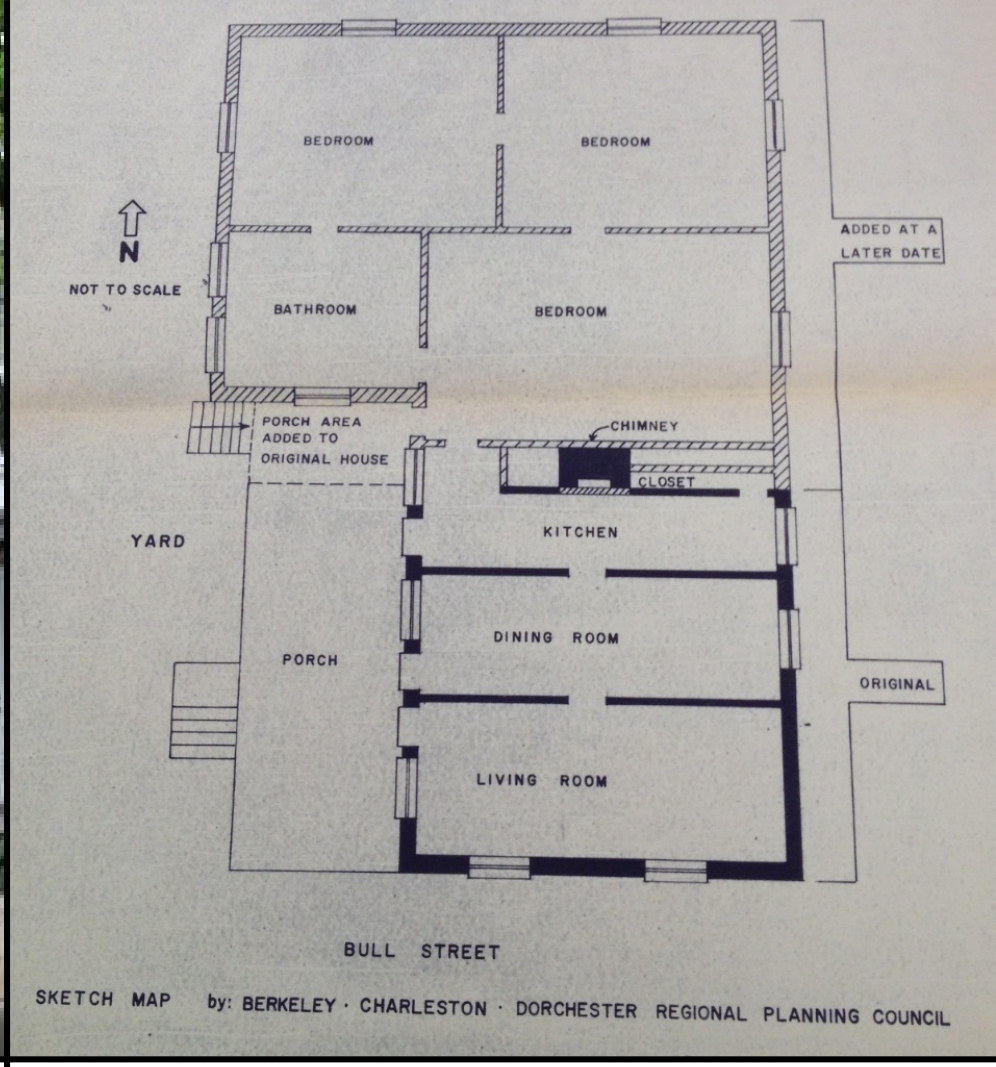
Katie Dykens

Commemoration and Controversy:
The Memorialization of Denmark Vesey in Charleston, South Carolina

Katie Dykens

There are four major commemorative objects devoted to Denmark Vesey in Charleston. I have studied these four instances of memorialization in an effort to shed light on how the memorialization of a contested figure such as Vesey is navigated. Additionally, an analysis of these memorials provides a lens through which to examine the arc of racial understanding in Charleston.

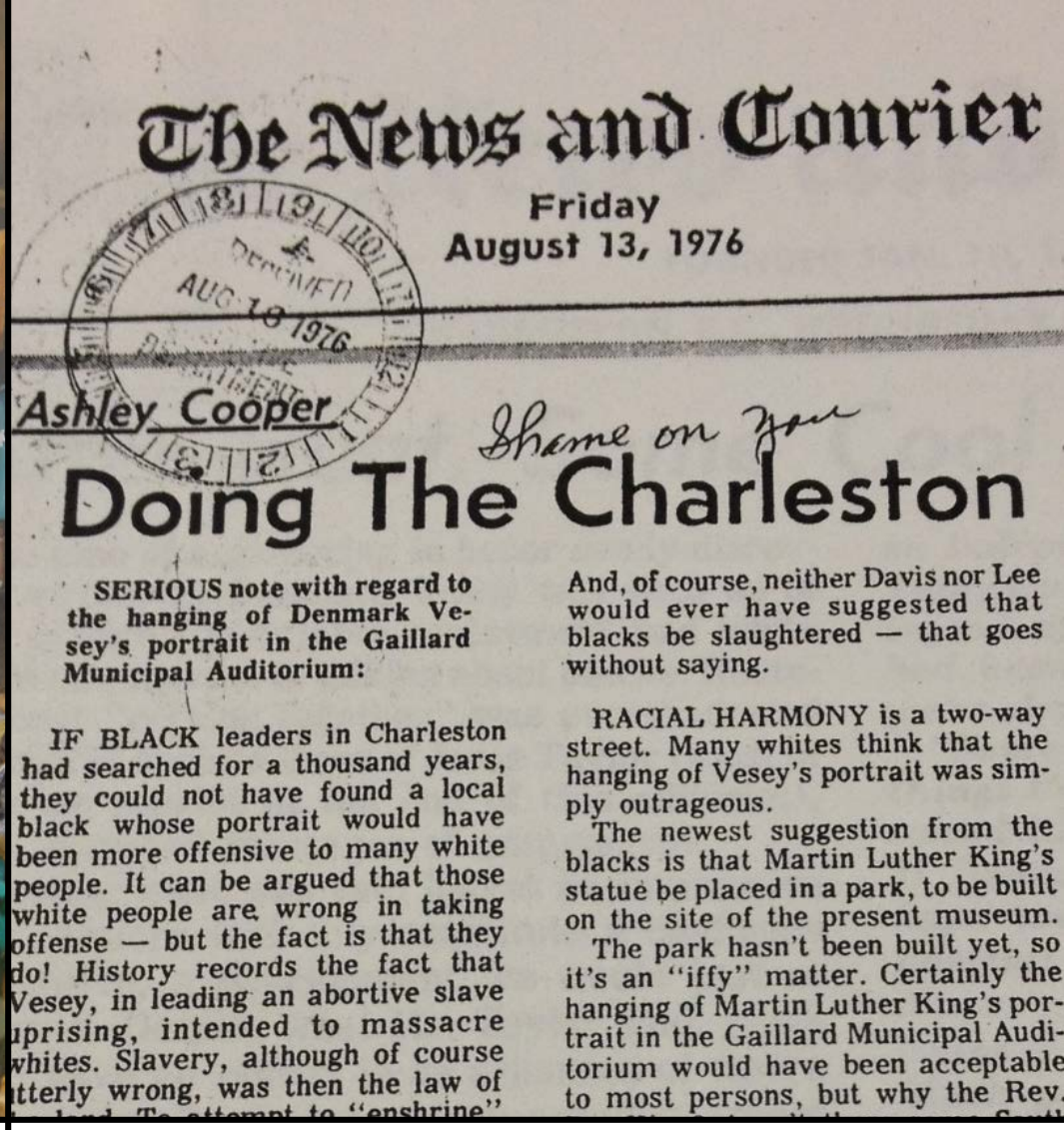
These insights will benefit preservationists interested in supporting a more well-balanced and diverse historic narrative as well as anyone who is interested in studying the commemoration of complex historic figures.



Denmark Vesey House
National Historic Landmark

1976

Painting in Gaillard Auditorium
Dorothy B. Wright



The News and Courier

Friday
August 13, 1976

RECEIVED AUG 18 1976

Ashley Cooper

Shame on You

Doing The Charleston

SERIOUS note with regard to the hanging of Denmark Vesey's portrait in the Gaillard Municipal Auditorium:

IF BLACK leaders in Charleston had searched for a thousand years, they could not have found a local black whose portrait would have been more offensive to many white people. It can be argued that those white people are wrong in taking offense — but the fact is that they do! History records the fact that Vesey, in leading an abortive slave uprising, intended to massacre whites. Slavery, although of course utterly wrong, was then the law of

And, of course, neither Davis nor Lee would ever have suggested that blacks be slaughtered — that goes without saying.

RACIAL HARMONY is a two-way street. Many whites think that the hanging of Vesey's portrait was simply outrageous.

The newest suggestion from the blacks is that Martin Luther King's statue be placed in a park, to be built on the site of the present museum.

The park hasn't been built yet, so it's an "iffy" matter. Certainly the hanging of Martin Luther King's portrait in the Gaillard Municipal Auditorium would have been acceptable to most persons, but why the Rev.

1976

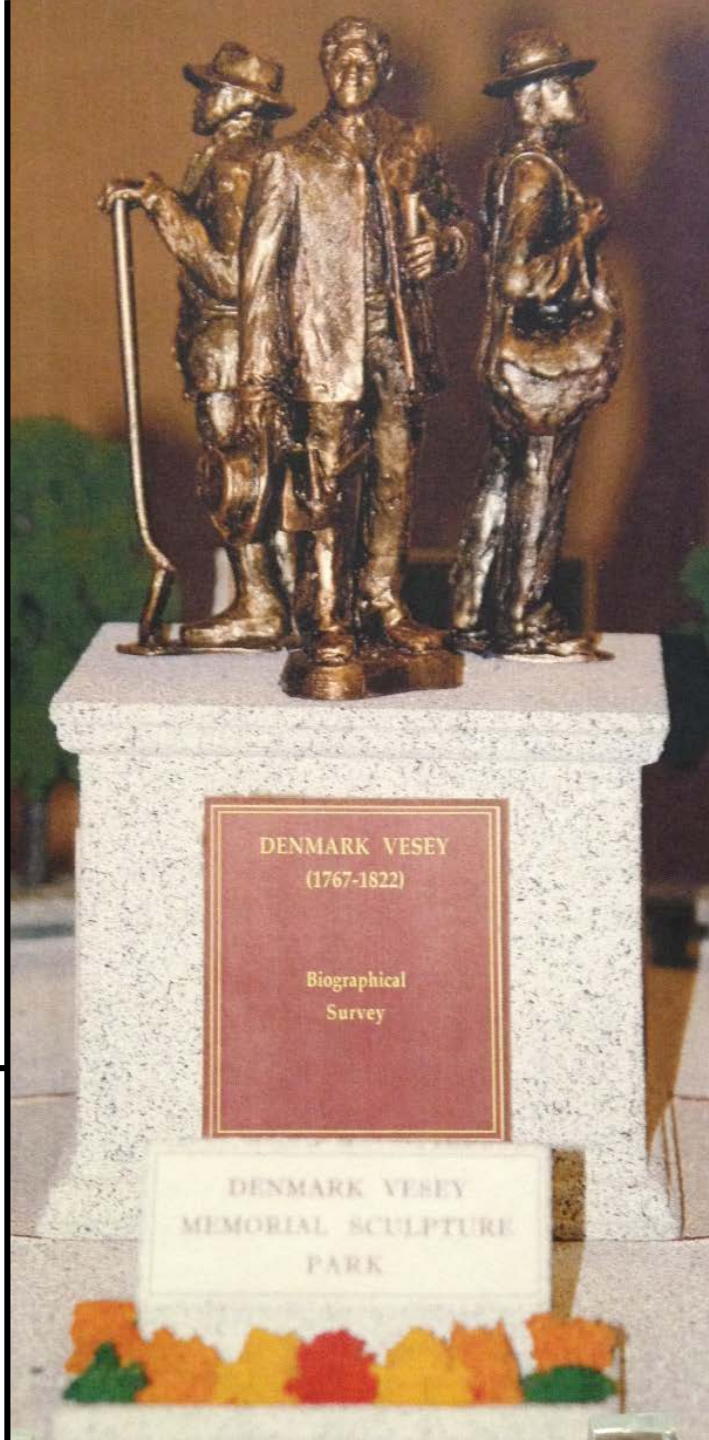
Sculpture in Emanuel A.M.E. Church
Ronald Jones

1991

Denmark Vesey Monument

Ed Dwight

2014



Greater Impacts

- Charleston as a model for other communities with similarly contested figures
  - Nat Turner in Virginia
  - Fred Hampton in Chicago

- Provides a detailed study of the "Charleston model"
- Shows that controversy at the time of installation does not necessarily result in a continually divisive memorial
  - Negates the "don't rock the boat" argument
- Shows that past failures do not preclude future successes
- Shows that a under-represented demographic group can present their heroes on their terms and provide benefits to the community as a whole

sdykens@g.clemson.edu

Thank you!

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Lauren Hoopes

On the Periphery:
A Survey of Nineteenth-Century Asylums in the United States

Lauren Hoopes

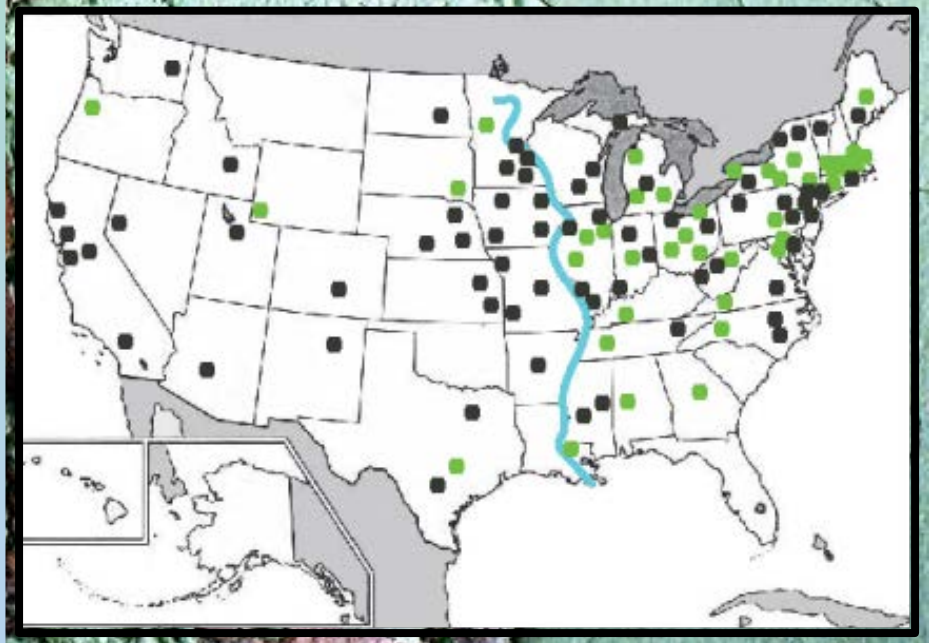
MSHP Class 2015

Narrative of Thesis

Comparative survey of government-operated purpose-built mental health hospitals built between 1835-1900 throughout the continental United States. The survey revealed differences between asylums designated to the NRHP and NHL programs and those without designation as well as highlighted patterns found within the asylum typology.

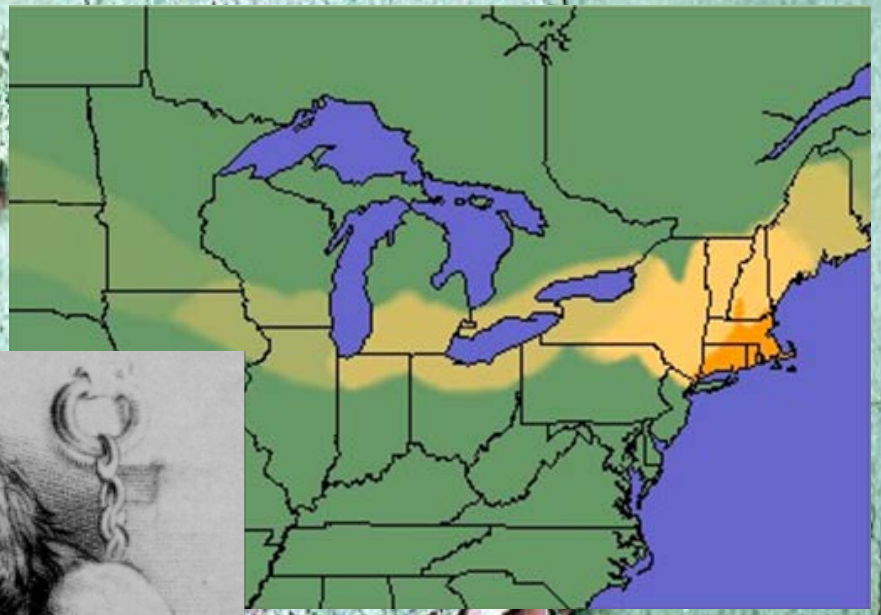
Findings

- 109 Asylums – 41 NRHP – 6 NHL
- Influence of Historical Events
  - Gold Rush
  - Civil War and the freeing of slaves
  - General population growth
- Building plan
  - 56% Kirkbride echelon (NRHP (73%) and NHL (67%)).
  - 28% Cottage plan (NRHP (~20%) and NHL (16%)).



Typology-Wide Patterns

- Population growth->National growth
- Changing roles of the government
- Humane treatment



Conclusions

- Mitigation
  - Continued loss of the typology
  - Documentation efforts
  - Increased representation west of the Mississippi River

Significance

- Why should we care?
  - Nineteenth century was a time of great change, and asylums are a physical manifestation of those changes.
- Thesis contributes a never-before undertaken survey of nineteenth-century government asylums in US

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Taylor Johnston

The Challenge of Balance: A Study of the Recent History of the Board of Architecture Review & its Design Standards on the Calhoun Street Corridor in Charleston, South Carolina

A Thesis Presented to
the Graduate Schools of
Clemson University and College of Charleston

Taylor Johnston

Spring 2015

Why is this relevant?

- Hoped to make sense of a confusing and opinion-dominated subject
- Charleston's future relies on successful urban planning and use of good design
- Personal questions:
  - Is the BAR the villain everyone makes it out to be?
  - How much does their design review affect new construction?
  - How has the city handled a key corridor in the city that connects so many aspects of the community?

Calhoun Street Corridor & the BAR

- Focused on the “artery of the city”
- Analyzed 13 “case study” commercial buildings constructed or heavily renovated between 1975-2015
- Used public resources, newspapers, preservation organization notes and personal statements, and BAR documents for conclusions

Calhoun Street Conclusions

- The BAR has had minimal effect on the corridor
- The BAR tended to focus on secondary architectural features rather than significant overall design alterations

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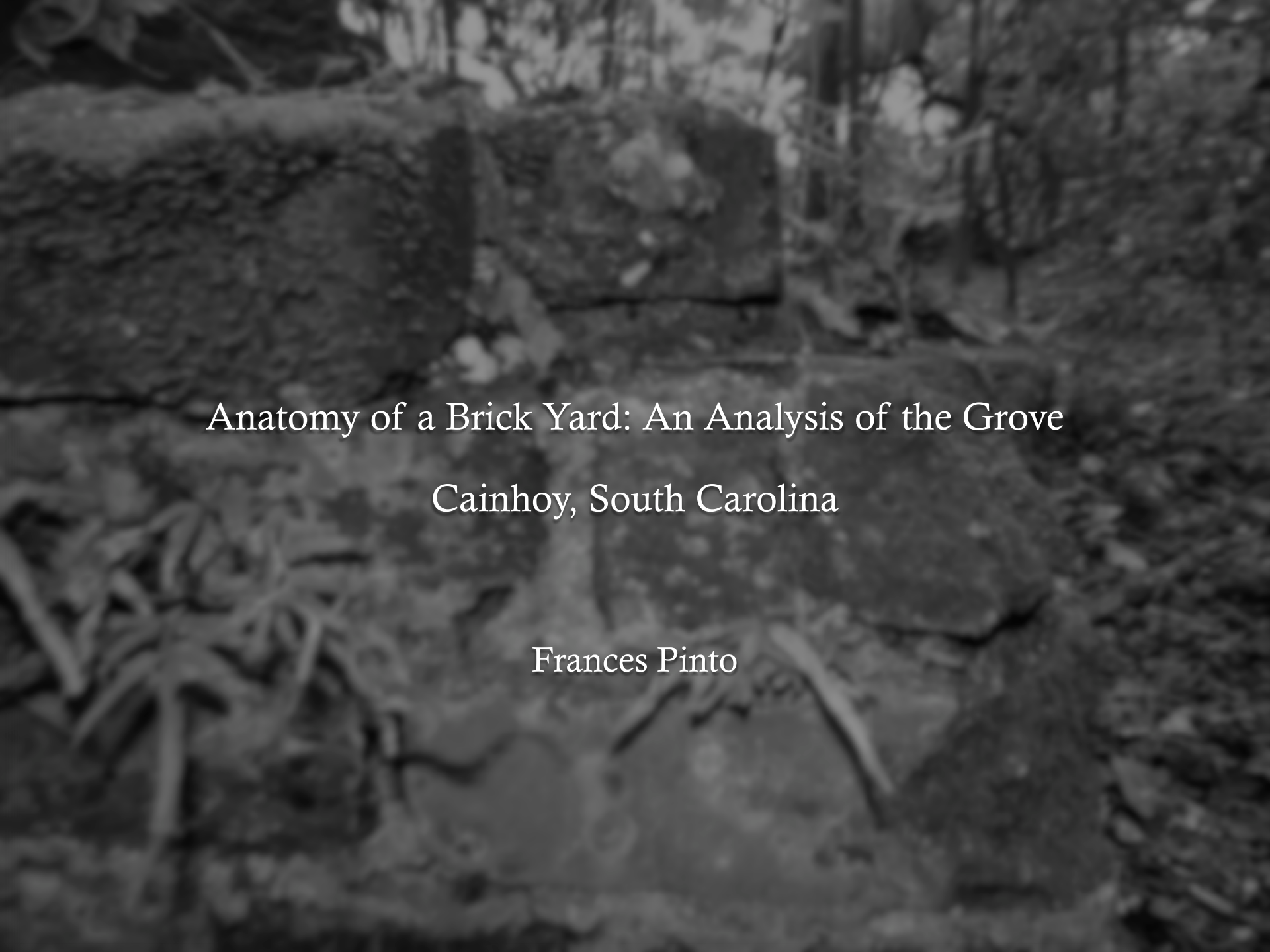
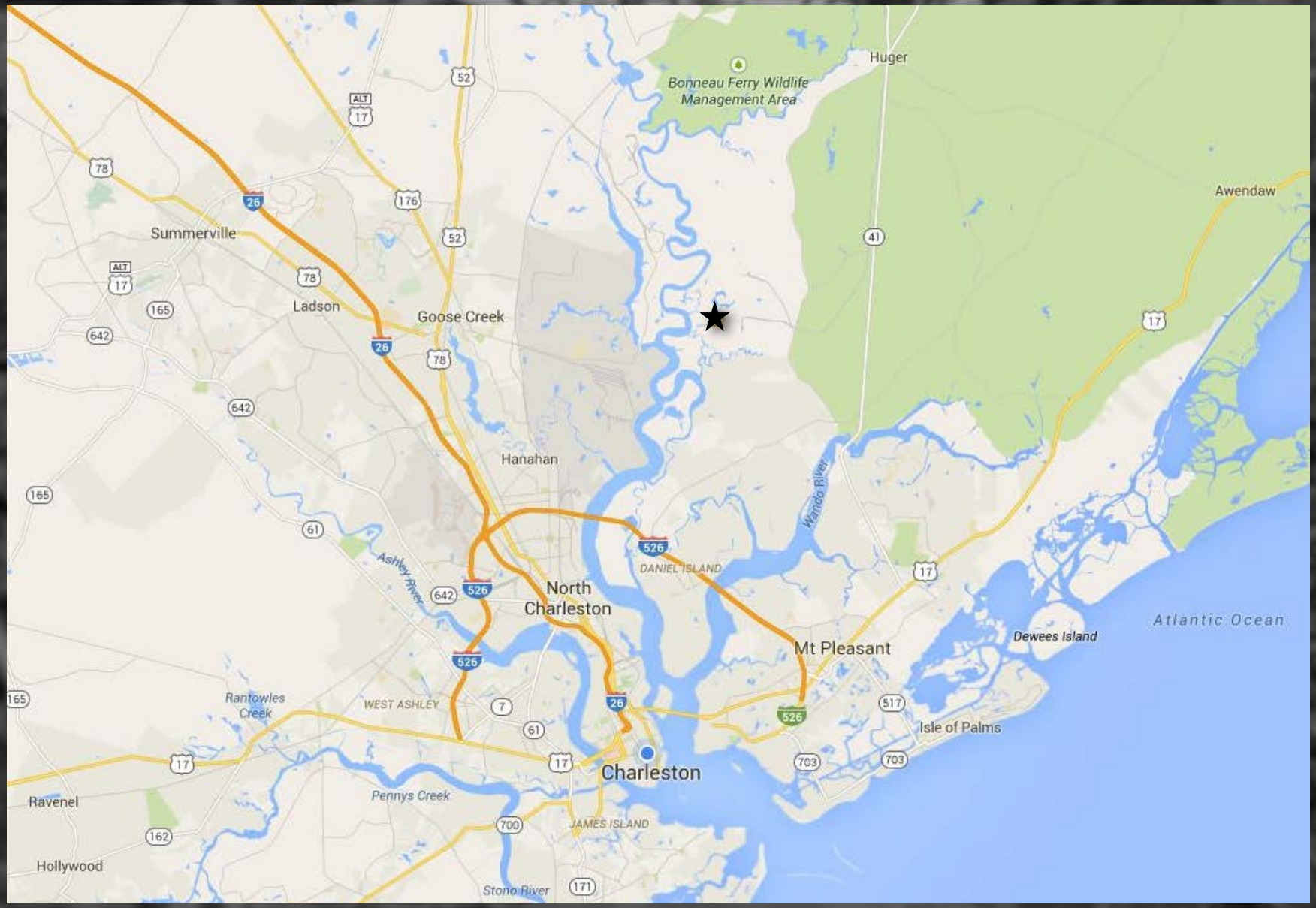
Frances Pinto

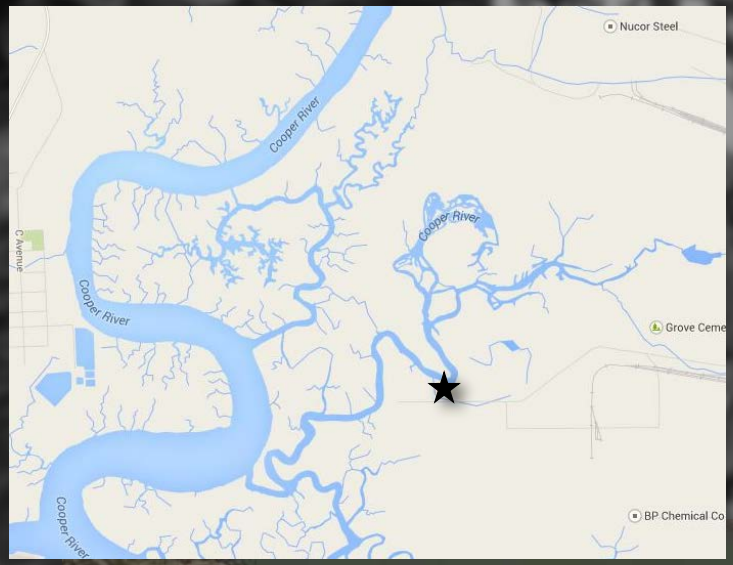


Anatomy of a Brick Yard: An Analysis of the Grove

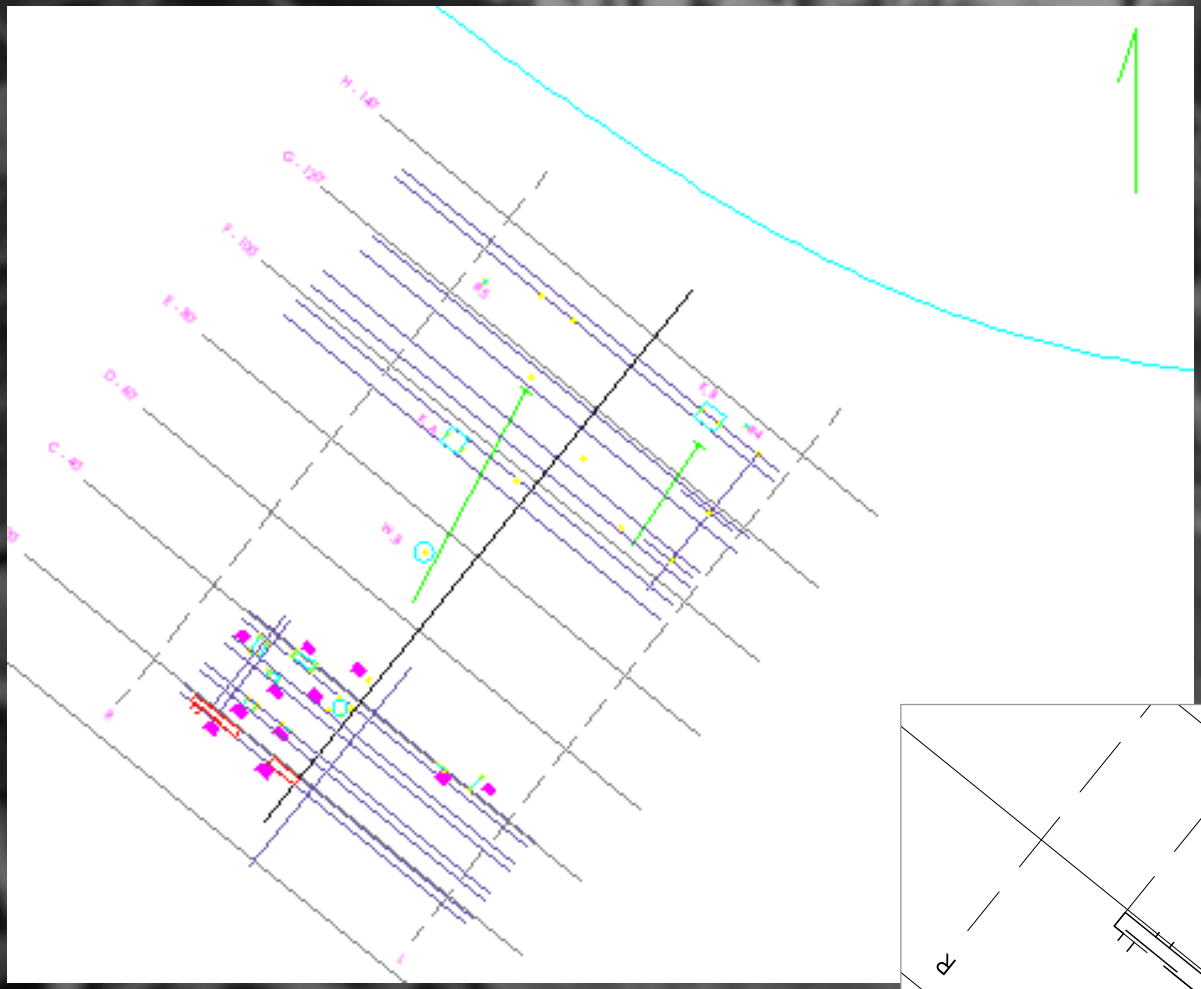
Cainhoy, South Carolina

Frances Pinto


Bonneau Ferry Wildlife Management Area
Huger
Awendaw
Summerville
Ladson
Goose Creek
Hanahan
Wando River
DANIEL ISLAND
North Charleston
Ashley River
Mt Pleasant
Dewees Island
Atlantic Ocean
Isle of Palms
Rantowles Creek
WEST ASHLEY
Charleston
Pennys Creek
JAMES ISLAND
Ravenel
Hollywood
Stono River


Nucor Steel
Cooper River
Cooper River
Cooper River
C Avenue
Grove Ceme
BP Chemical Co
Cooper River

Brick Path
Sand
Clay



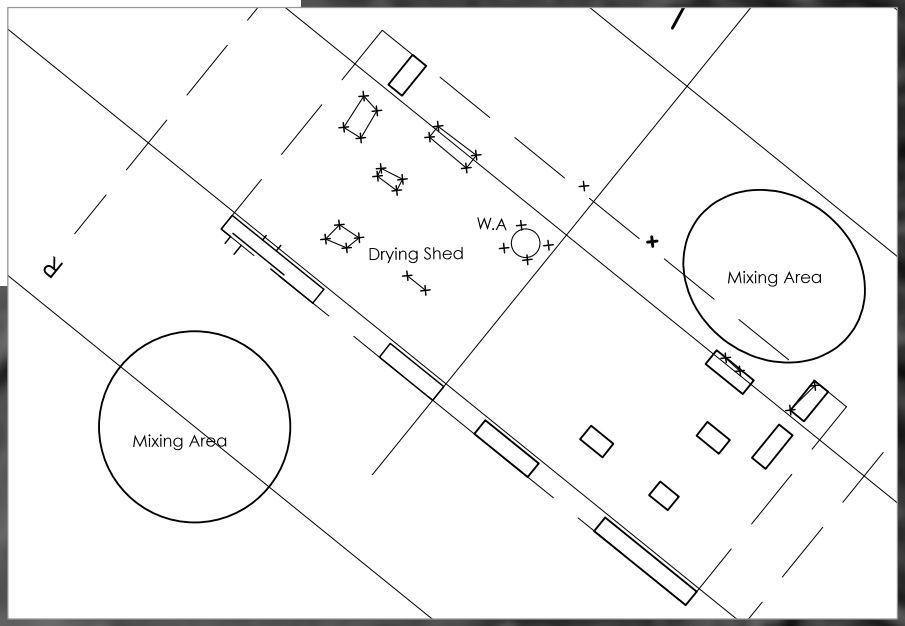

Drying Shed
W.A
Mixing Area
Mixing Area

photo	name	artifact	description (fragment, glaze, soft, edges, heavy, color, bio, mortar)	site	type	designation	location	sample #	length (face)	width (head)	height (thickness)	weight	other
	kiln A												
X	GC.K.A.1	brick	angle, hard, sharp edges, dark	grove creek	kiln	A		1	8.250	3.900	2.440		angle start
	kiln B												
	GC.K.B.1	brick	fragment, glazed, green	grove creek	kiln	B		1	5.720	4.920	3.700		glaze thickness
	GC.K.B.2	brick	fragment, soft, sharp edges, salmon	grove creek	kiln	B		2	3.295	3.950	2.420		
X	GC.K.B.3	nail	head	grove creek	kiln	B		3	0.620	0.200	---		head diameter
X	GC.K.B.4	nail	body	grove creek	kiln	B		4	0.520	0.160	---		
	GC.K.B.5	brick	fragment, sharp edges	grove creek	kiln	B		5	4.150	4.000	2.280		
	GC.K.B.6	brick	fragment, round edges, heavy	grove creek	kiln	B		6	7.500	4.670	3.070		
X	GC.K.B.7	brick	fragment, soft	grove creek	kiln	B		7	4.100	4.000	2.320		shorter side
X	GC.K.B.8	brick	fragment, glaze - green, hard, round edges, dark	grove creek	kiln	B		8	3.190	3.140			
X	GC.K.B.9	brick	pieces, glaze - green, hard, round edges, dark	grove creek	kiln	B		9	4.600	4.350	3.328		glaze thickness
X	GC.K.B.10	brick	fragment, hard, heavy, red mortar	grove creek	kiln	B	nature trail	10	6.000	4.000	2.460		mortar thickness
X	GC.K.B.11	brick	hard, heavy, dark, mortar	grove creek	kiln	B	nature trail	11	8.250	4.200	2.420		mortar thickness
	GC.K.B.12	brick	fragment, hard, sharp edge, pale, lime wash?	grove creek	kiln	B		12	6.125	4.050	2.330		lime?
	GC.K.B.13	brick	fragment, soft, round edges, dark	grove creek	kiln	B		13	3.850	4.550	2.780		
	GC.K.B.14	brick	small fragment, hard, no edges, dark	grove creek	kiln	B		14	2.900	2.500	0.950		
	GC.K.B.15	brick	fragment, hard, no edges, dark	grove creek	kiln	B		15	7.250	7.825	1.890		formed edge, thickness
	GC.K.B.16	root	root growth shows angles from growning around bricks	grove creek	kiln	B		16	20.000		1.000		
	GC.K.B.17	brick	hard, round edges, dark, red mortar	grove creek	kiln	B		17	9.500	5.100	2.650		mortar
	GC.K.B.18	brick	fragment, glaze - green, hard, round edges, dark	grove creek	kiln	B		18	5.380	4.650	2.150		
	GC.K.B.19	brick	fragment, glaze-green, hard, dark	grove creek	kiln	B		19	5.150	5.000	3.100		glaze
	GC.K.B.20	brick	glaze - green (both ends), hard, round edges, dark, red mortar	grove creek	kiln	B		20	9.875	4.800	1.750		mortar
	GC.K.B.21	brick	hard, sharp edges, heavy, dark, red mortar	grove creek	kiln	B		21	8.250	4.150	2.450		mortar
	GC.K.B.22	brick	hard, sharp edges, pale	grove creek	kiln	B		22	8.250	4.100	2.480		
	GC.K.B.23	brick	fragment, glaze - green, hard, no edge, dark	grove creek	kiln	B		23	4.825	3.125	2.950		glaze
	GC.K.B.24	brick		grove creek	kiln	B		24					
	GC.K.B.25	brick	fragment, glaze - green, hard, no edge, dark	grove creek	kiln	B		25	1.500	2.950	2.350		glaze
	GC.K.B.26	tile	fragment, glaze - black, found in kiln	grove creek	kiln	B		26	3.550	3.190	0.470		
	GC.K.B.27	brick	fragment, glaze - green, hard	grove creek	kiln	B		27	1.300	2.640	2.050		width, max
	GC.K.B.28	brick	fragment, glaze - green, hard, no edge, mortar	grove creek	kiln	B		28	2.125	1.100	1.000		glaze + mortar
	GC.K.B.29	brick	fragment, glaze - green, mortar with little brick attached	grove creek	kiln	B		29	0.700	2.000	1.300		
	building												
X	GC.S.A.1	plate	square plate, off center hole	grove creek	structure	A		1	4.090	4.120	0.170		hole diameter
X	GC.S.A.2	nail	square head, section	grove creek	structure	A		2	1.500	0.230	---		head diameter
X	GC.S.A.3	nail		grove creek	structure	A		3	3.035	0.230	---		head diameter
	GC.S.A.4	plate	square plate, center hole	grove creek	structure	A		4	2.000	1.720	0.160		hole diameter
	GC.S.A.5	unknown	thick rectangular	grove creek	structure	A		5	3.445	2.000	0.700		
	GC.S.A.6	plate	rectangle, rust	grove creek	structure	A		6	3.870	1.280	0.280		
X	GC.S.A.7	nail	rectangular section, slight head	grove creek	structure	A		7	0.900	0.180	0.130		head
X	GC.S.A.8	brick	fragment, round edges, soft mortar	grove creek	structure	A		8	6.000	4.080	2.600		

Thank You

GRADUATE PROGRAM IN HISTORIC PRESERVATION

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Sarah Sanders

One Land, Two American Dreams

Rediscovering the Secondary duPont Narrative at James Madison's Montpelier

Sarah Sanders, April 23, 2015

Thesis Statement:

How can an analysis of the duPont secondary narrative at James Madison's Montpelier encourage the revaluation of the estate's historic resources and serve as a model for the incorporation of multifaceted histories at other institutions?

Methodology

1. Significance and Secondary Narratives

2. Investigation of duPont Impact

3. Development of Value Based Approach

Heritage Values (*English Heritage)*

1) Evidential Value

2) Historic/Interpretative Value

3) Aesthetic Value

4) Communal Value

Latent Values

1) Economic: a site's ability to capitalize upon its assets in order to maintain financial viability

2) Educational: a site's potential to convey and interpret information

3) Development: a site's ability to grow/expand programmatically and/or physically

4) Recreational: a site's ability to actively engage visitors

The Impact

1) Call for the re-evaluation of the significance criteria within the United States

2) Realization of potential value at Montpelier, leading to incorporation of duPont and other secondary narratives

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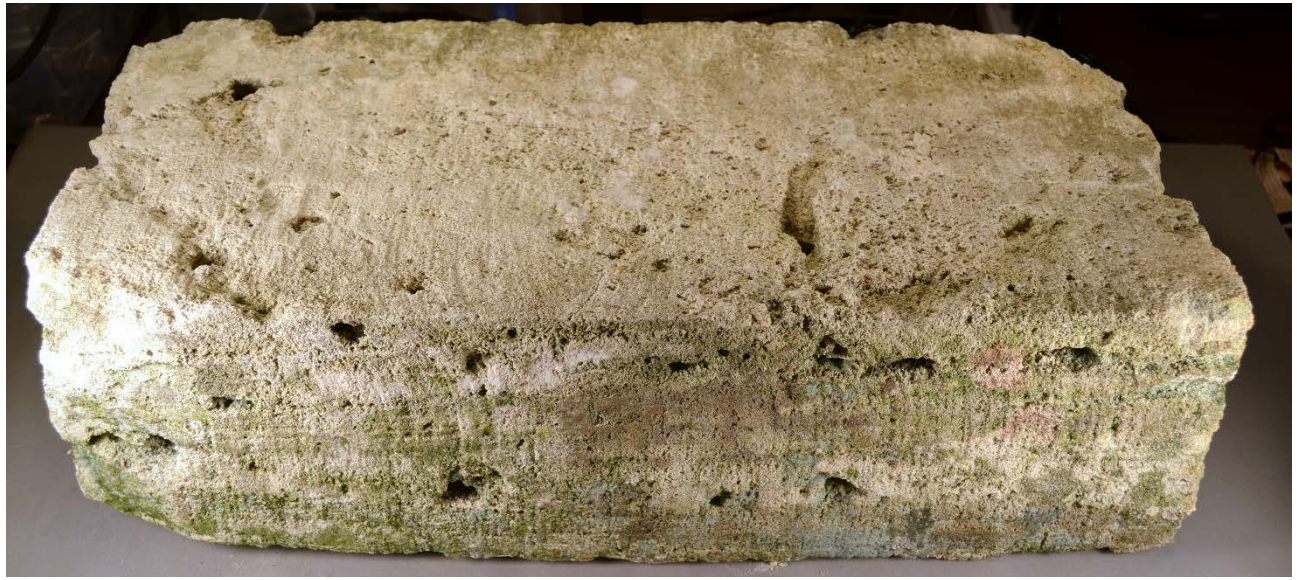
Justin Schwebler



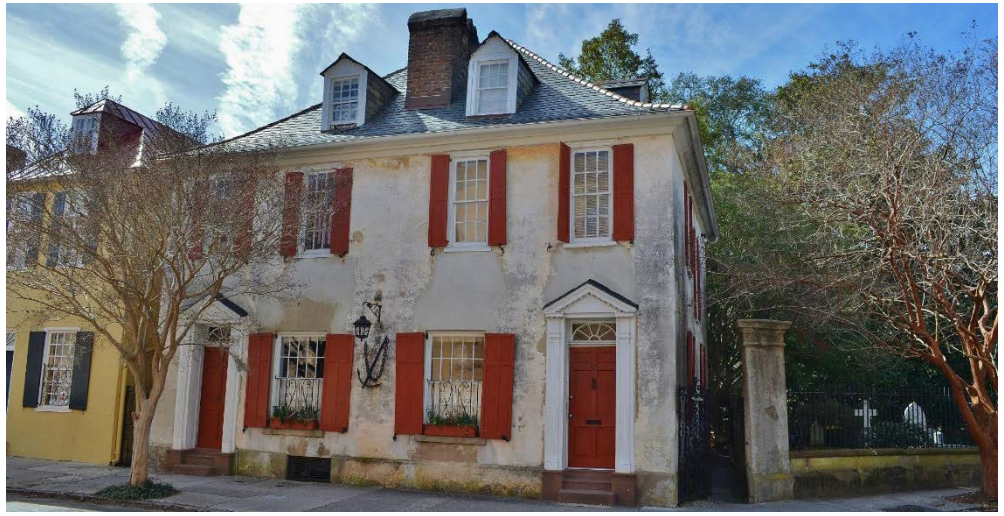
The Forgotten Stone

A HISTORY AND ANALYSIS OF BERMUDA STONE IN CHARLESTON, SOUTH CAROLINA

BY: JUSTIN SCHWEBLER

Statement of Purpose

In our many tours through Charleston's Old and Historic District Bermuda stone was often pointed out to us. There was never a detailed answer as to how and why the material was brought to Charleston. Historic Charleston Foundation had begun to document the known Bermuda stone locations throughout the city. I was immediately intrigued by the stone and was determined to recover the history of the material and shed light on its significance in Charleston to the preservation community and the public.



Summary of Findings (Geology)

Bermuda stone was formed throughout the Pleistocene Epoch (2 million-100,000 years ago).

It has two primary forms (Marine Deposit Limestone and Aeolian Deposit Limestone).

Marine Deposit stone is more dense and has many shell fragments and fossilized inclusions.

Aeolian Deposit stone is less dense and is composed of small round, calcium -rich, granules.

Marine Deposit Limestone

Aeolian Deposit Limestone

Summary of Findings (Bermuda)

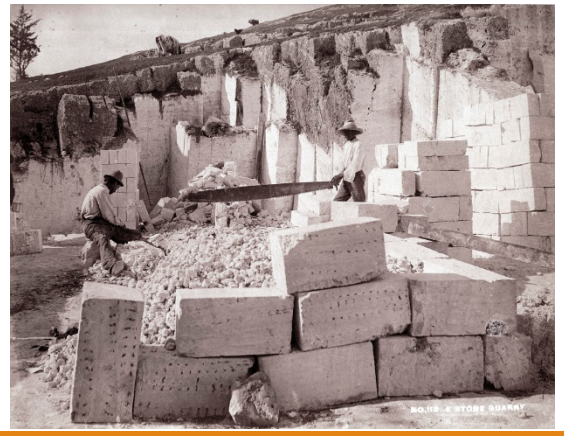
Bermuda stone was first utilized as a building material on the islands of Bermuda in the 17th century.

The stone was quarried with hand saws, chisels, feathers, wedges, and picks.

It was cut into two primary types of blocks (shingles and building blocks).

The larger blocks were used to construct walls in buildings, gardens, and fortifications.

The thin shingles were used to create a heavy layered roof that also collected rainwater.



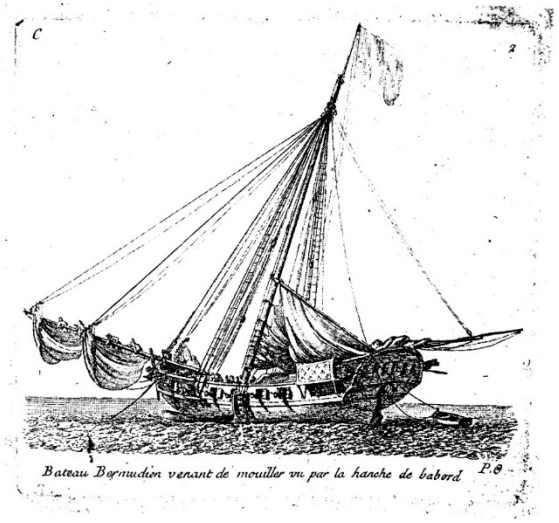
Summary of Findings (Importation)

More people began using Bermuda stone in the early 18th century buildings of Charleston.

The stone was no longer a simple ballast. It became a valuable commodity for Bermudian merchants.

In 1737 around 600 Bermuda stone blocks were imported to Charleston

By 1772 that number had increased to 41,100 blocks.



Summary of Findings (Use in Charleston)

Bermuda stone was used in Charleston in three primary ways.

In building foundations and walls. (Buildings)

In garden walls or sea walls. (Stand-alone walls)

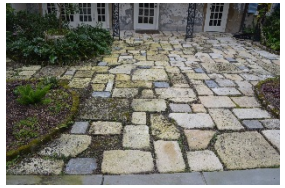
As a surface for courtyards and driveways. (Paving)

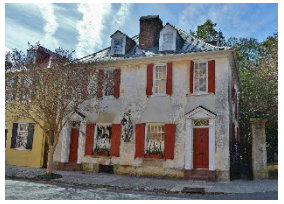
There are 19 surviving locations throughout the city where Bermuda stone was identified. (not including locations referenced in historic documents)

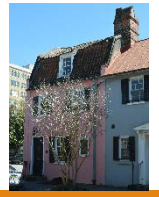
10 of these locations the Bermuda stone is used in the Building construction

4 of these locations are stand-alone walls.

5 of these locations Bermuda stone is used as a paving material.







Conclusions and Significance

Bermuda stone was brought to Charleston by Bermudian traders from the late 17th century through the beginning of the 19th century.

The stone was a highly durable and sought after building material. This is shown by the number of surviving buildings, walls, and courtyards where it was used and also the substantial numbers of stones that were being brought to Charleston annually throughout the 18th century.

Bermuda stone is a small but critically important aspect of Charleston's architectural heritage.

It is a significant material due to its durability, its notable place in the historic fabric of Charleston, the variety of ways in which it was used in the city, and also for the insight it provides into Charleston's social, economic, and political history.

With this thesis as a statement of Bermuda stone's significance, I hope that the preservation community and the public of Charleston continue to identify, document, and preserve Bermuda stone for the benefit of future generations, and for the ongoing preservation of Charleston's architectural heritage.

Thank You

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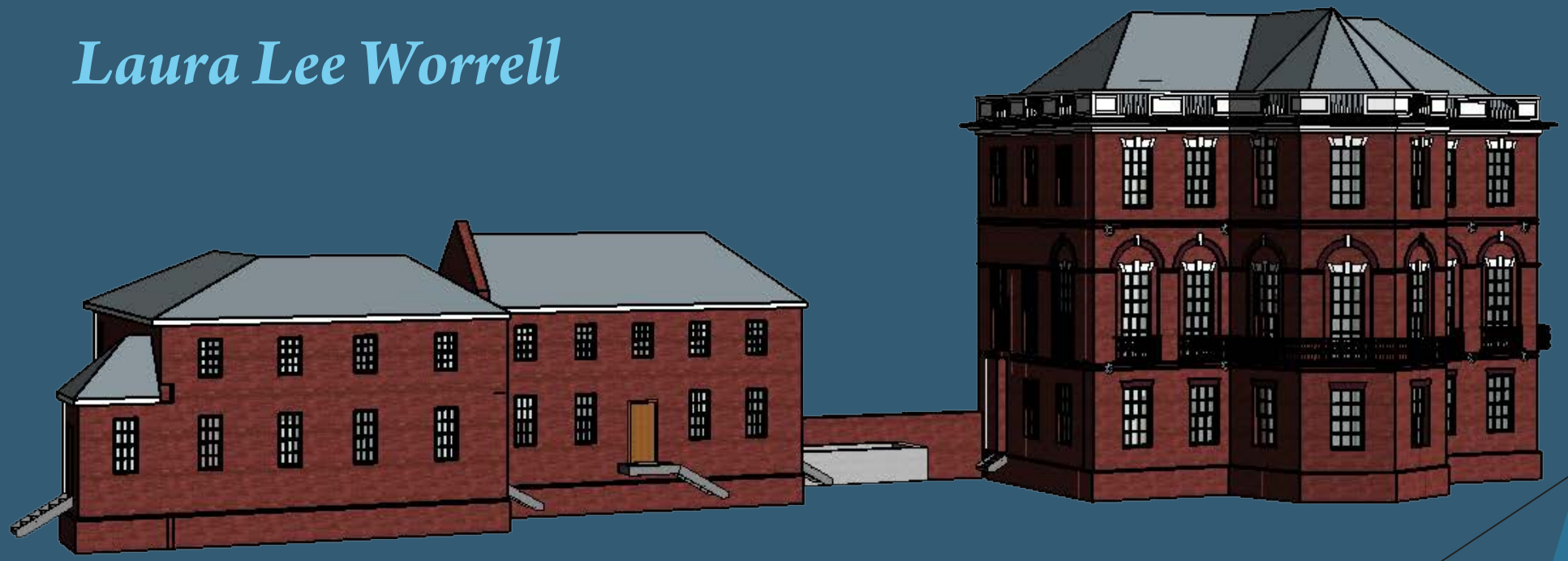
Laura Lee Worrell

Building Information Modeling (BIM): The Untapped Potential for Preservation Documentation and Management

Laura Lee Worrell



- **Introduction**
- Case Study
- Findings
- Research & Documentation
- Revit
- Navisworks
- Testing
- Conclusion

Introduction

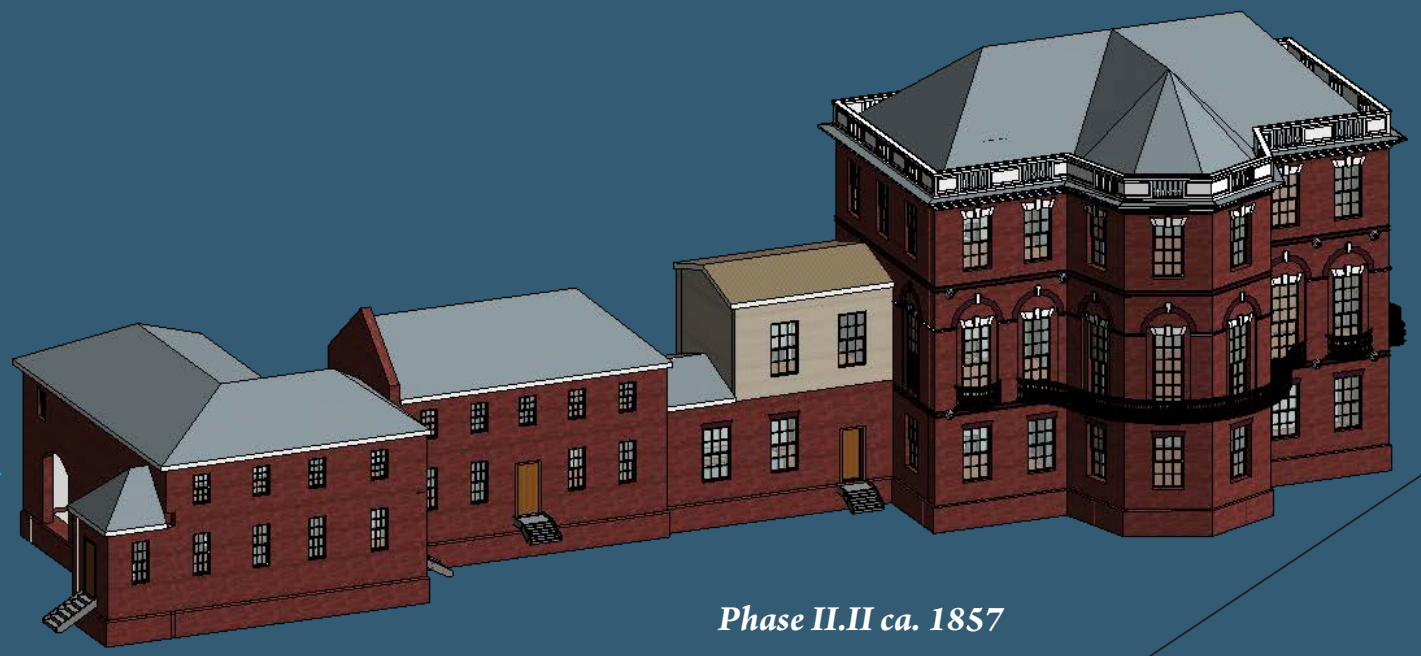
- This thesis explores the utilization of BIM as an effective records management 3D user interface for historic resource stakeholders. A case study to develop an effective work flow for producing a model and accessing the records in the BIM interface will serve as a method to expand the potential use and knowledge of BIM in the preservation community.

Phase I ca. 1808-1832

- Introduction
- **Case Study**
- Findings
- Research & Documentation
- Revit
- Navisworks
- Testing
- Conclusion

Case Study: Nathaniel Russell House

- Questionnaire
- House Museum
  - Owner Interest & Investment
  - Long Term

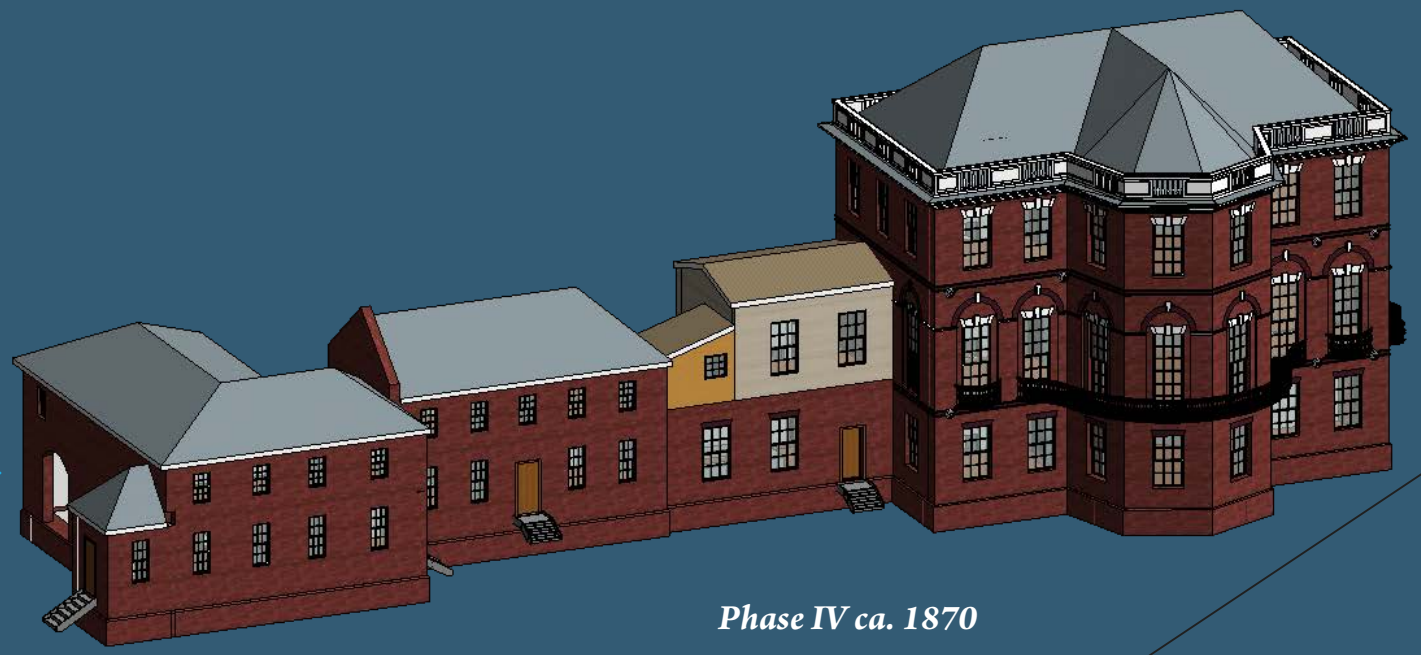


Phase II.II ca. 1857

- Introduction
- **Case Study**
- Findings
- Research & Documentation
- Revit
- Navisworks
- Testing
- Conclusion

Case Study: Nathaniel Russell House

- Research & Documentation (provided by HCF)
- Revit
- Navisworks
- Testing



Phase IV ca. 1870

- Introduction
- Case Study
- Findings
- **Research & Documentation**
- Revit
- Navisworks
- Testing
- Conclusion

Findings: Research & Documentation

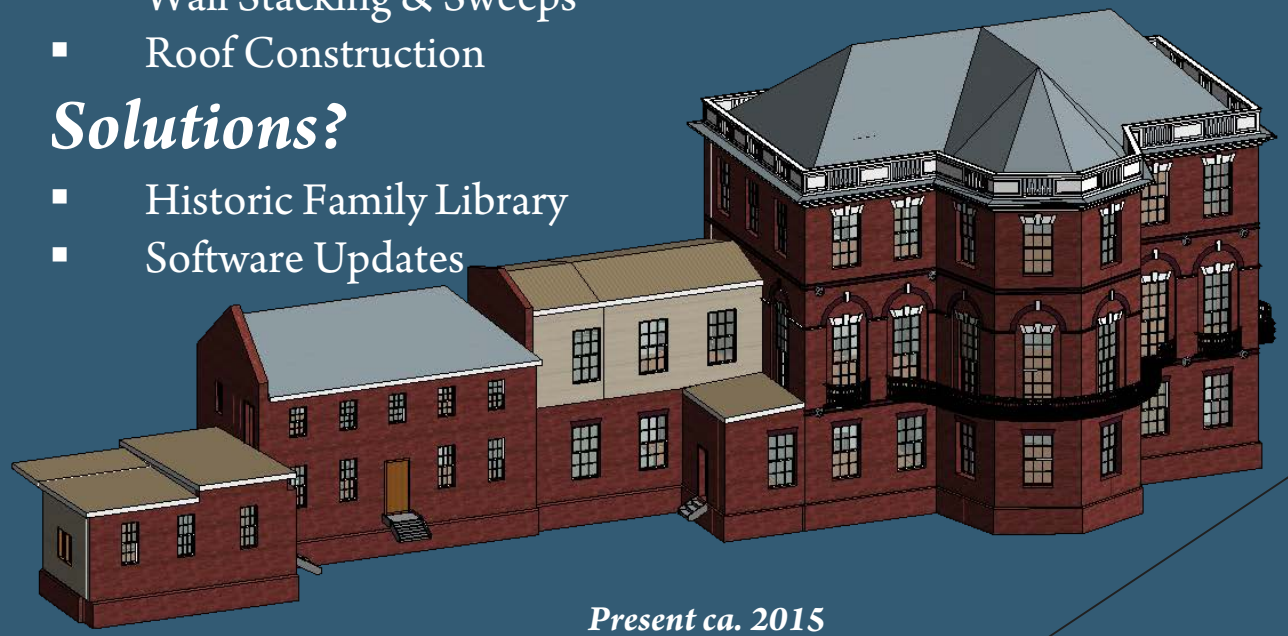
- Historic Structures Report (HSR)
  - Most Historic Information
  - No Updates
- Digital Records
  - Before Will Hamilton
  - After Will Hamilton
- ***Is there a need?***

Phase V ca. 1913

- Introduction
- Case Study
- Findings
- Research & Documentation
- **Revit**
- Navisworks
- Testing
- Conclusion

Findings: Revit

- No Historic Family Types
- Ellipse Geometry
- Software Glitches
  - Material connections
  - Wall Stacking & Sweeps
  - Roof Construction
- ***Solutions?***
  - Historic Family Library
  - Software Updates

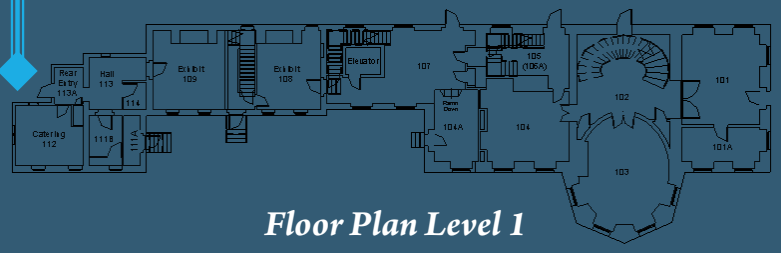


Present ca. 2015

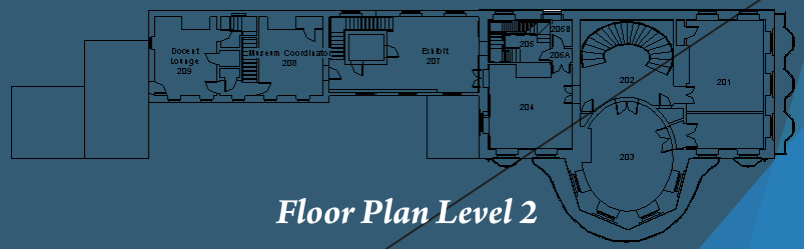
- Introduction
- Case Study
- Findings
- Research & Documentation
- Revit
- **Navisworks**
- Testing
- Conclusion

Findings: Navisworks

- Understanding File Types (.nwd, .nwf, .nwc)
- Timeliner Application
- External Document Linkage
- Editability in Navisworks Freedom
- ***Solutions?***
  - Software Updates
  - Plugin Applications



Floor Plan Level 1



Floor Plan Level 2

- Introduction
- Case Study
- Findings
- Research & Documentation
- Revit
- Navisworks
- **Testing**
- Conclusion

Findings: Testing

- Navigability
- Accessibility
- Visuals
- Implementation
- Software and Digitization Concerns
- Cost
- ***Suggestions?***
  - Calendar Alert Application

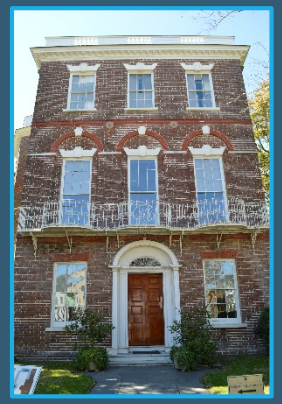
Floor Plan Level 3

- Introduction
- Case Study
- Findings
- Research & Documentation
- Revit
- Navisworks
- Testing
- **Conclusion**

Conclusions

- Application Development
  - Economic and Social Benefit Cycle
- Added Application Benefits
  - Curation and Public Education Tools
  - Funding Tool
  - Restoration and Renovation Tool

HBIM – Preservation for the Future…



Thank You

Current Research in Historic Preservation

Session Three ▸ 11:00 – 11:45

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