Charleston's Urban Outbuildings Within the Historic Walled City, 1884-1955

Kerri Michelle Ross
Clemson University, ross-kerri@comcast.net

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Abstract

This thesis investigates the architectural and micro spatial patterning development of outbuildings within the walled city of Charleston, South Carolina. The goal of this thesis is to study how accessory buildings in Charleston, South Carolina have evolved between 1884 and 1955. The study area is within Charleston’s historic walled city, a 30.4-acre area bounded by Meeting Street on the west, East Bay Street on the east, Cumberland Street on the north and Water Street on the south. The 1884, 1902 and 1955 Charleston Fire Insurance Maps illuminate the expansion of the nineteen blocks within the walled city of Charleston over the late nineteenth and early-twentieth centuries. The Fire Insurance Maps are analyzed to observe changes that occurred on each property within the study area with respect to massing, location of the accessory buildings related to the main building, materials and number of stories. Survey123 and ArcGIS Online chart architectural relationships found between 798 primary buildings and 1413 secondary buildings located in the focus area. Analysis of spatial patterns, materials, building use and building evolution reveal the historic development of Charleston’s urban outbuilding. The data shows back buildings in Charleston are purpose-built utilitarian buildings, typically constructed linearly behind the primary building and have become smaller in size and form between 1884 and 1955. This thesis creates an inventory of the buildings behind the big houses that has not been completed in any prior surveys or research, and findings support preservation and continued use of historic secondary buildings and will provide an informed background for new outbuildings to be constructed within Charleston that are sensitive to building patterns of secondary buildings on the peninsula.
Acknowledgements

It is with complete appreciation and gratitude that I extend thanks to everyone who has supported me in some way to complete this study of Charleston’s back buildings.

To my thesis committee, Amalia Leifeste, Craig Bennett and Carter Hudgins, thank you for your support, assistance and knowledge. Your guidance has been invaluable in creating something I could never have completed on my own.

To my momma, all my love and thanks. This journey would not be possible without your support and encouragement through this process and through the past two years of graduate school.

And to Mollie—All my love.
Table of Contents

List of Figures ........................................................................................................................................ V

List of Tables .......................................................................................................................................... viii

Chapters

Chapter 1: Introduction ......................................................................................................................... 1

Chapter 2: Literary Review ..................................................................................................................... 5

Chapter 3: Methodology ......................................................................................................................... 22

Chapter 4: Data ..................................................................................................................................... 35

Chapter 5: Analysis ................................................................................................................................. 70

Chapter 6: Conclusion ............................................................................................................................. 95

Bibliography .......................................................................................................................................... 105

Appendices

Appendix A: 1884 Data ......................................................................................................................... 108

Appendix B: 1902 Data .......................................................................................................................... 116

Appendix C: 1955 Data .......................................................................................................................... 123

Appendix D: Sanborn Maps ................................................................................................................... 131
List of Figures

**Chapter 1: Introduction**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Map showing the boundaries of Charleston’s walled city</td>
<td>3</td>
</tr>
</tbody>
</table>

**Chapter 2: Literature Review**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Graphic of rural carriage house</td>
<td>16</td>
</tr>
</tbody>
</table>

**Chapter 3: Methodology**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Map of Charleston</td>
<td>23</td>
</tr>
<tr>
<td>3.2</td>
<td>Property Survey question</td>
<td>27</td>
</tr>
<tr>
<td>3.3</td>
<td>Accessory and primary building material question</td>
<td>28</td>
</tr>
<tr>
<td>3.4</td>
<td>1902 Sanborn map, sheet 70 showing 15 Tradd Street</td>
<td>29</td>
</tr>
<tr>
<td>3.5</td>
<td>Secondary and primary enclosure ratio question</td>
<td>30</td>
</tr>
<tr>
<td>3.6</td>
<td>Secondary and primary buildings use question</td>
<td>30</td>
</tr>
<tr>
<td>3.7</td>
<td>Collected data and export options when exporting to a different file format in Survey123</td>
<td>32</td>
</tr>
<tr>
<td>3.8</td>
<td>Map showing shapefile points and data</td>
<td>33</td>
</tr>
</tbody>
</table>

**Chapter 4: Data**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>1852 Bridgens and Allen Map of Charleston fortification and urban fringe</td>
<td>36</td>
</tr>
<tr>
<td>4.2</td>
<td>Enclosure ratios of primary and secondary buildings found within the 1884 walled city</td>
<td>44</td>
</tr>
<tr>
<td>4.3</td>
<td>Halsey Map showing fire locations and dates during 1830’s Charleston</td>
<td>46</td>
</tr>
<tr>
<td>4.4</td>
<td>1884 Sanborn map, sheet 13 showing 45 Tradd Street</td>
<td>47</td>
</tr>
<tr>
<td>4.5</td>
<td>1884 Sanborn maps, sheet 12 showing 19 Broad Street</td>
<td>48</td>
</tr>
<tr>
<td>4.6</td>
<td>1902 Sanborn map, sheet 60 showing 23 and 25 Queen Street</td>
<td>49</td>
</tr>
</tbody>
</table>
Figure 4.7  1884 Sanborn map, sheet 12 showing 507 and 509 Elliot Street, now 22 Elliot Street and 28 Elliot Street ........................................................... 49
Figure 4.8  1884 Sanborn map, sheet 13 showing 95, 93 and 89 East Bay Street ......................................................................................................... 51
Figure 4.9  Secondary building use and accessibility surveyed in 1884 ......................................................... 52
Figure 4.10  Comparative data of building use during 1884 and 1902 .......................................................... 53
Figure 4.11  Enclosure ratio of primary and secondary buildings found within the walled city in 1902 ........................................................................... 57
Figure 4.12  1902 Sanborn map, sheet 69 showing 45 and 47 Broad Street ........................................... 60
Figure 4.13  Pie chart showing secondary materials found within the walled city in 1955 ................................................................. 62
Figure 4.14  Enclosure ratio of primary and secondary buildings found within the walled city in 1955 ........................................................................... 63
Figure 4.15  1884 Sanborn map, sheet 13 showing commercial and industrial area of Church Street ................................................................. 66
Figure 4.16  1955 Sanborn map showing once commercial Church Street area as residential ................................................................. 67
Figure 4.17  Data representing buildings location and accessibility in 1955 ............................................ 69

Chapter 5: Analysis

Figure 5.1  1902 Sanborn map showing examples of separate dwellings within the walled city ......................................................................................................... 83
Figure 5.2  1884 map of the walled city showing attached, detached, and hyphenated outbuildings ........................................................................... 87
Figure 5.3  1902 map of walled city showing attached, detached, and hyphenated outbuildings ........................................................................... 88
Figure 5.4  1955 Sanborn map of the walled city showing every detached dwelling and public and private garages ........................................................................... 90
Figure 5.5  Building distribution of properties found within
Charleston between 1750-1850 ................................................................. 91

Figure 5.6  1884 Sanborn, sheet 12 showing 922 Church Street and not 109 Church Street, and surrounding density ................................................. 93

Chapter 6: Conclusion

Figure 6.1  "An Exact Prospect of Charleston, the Metropolis of the Province of South Carolina" drawn by Bishop Roberts in 1762 ................................................................. 96

Figure 6.2  1955 Sanborn showing garage locations at 15 Tradd, 17 Tradd, and 19 Tradd ................................................................. 99

Figure 6.3  Plat depicting property layout at Society Street, July 1843 ................................................. 102

Figure 6.4  Building connections within the walled city in 1884, 1902, and 1955 ................................................................. 103
List of Tables

Chapter 2: Literature Review

Table 2.1 Address, building type, and current state of accessory buildings, by Samuel Gaillard Stoney .................................................................10

Chapter 4: Data

Table 4.1 Secondary building use surveyed from the 1884 Sanborn maps ....................37
Table 4.2 Primary building use surveyed from the 1884 Sanborn maps ..........................38
Table 4.3 Primary and secondary materials found on the 1884 Sanborn maps ..........................40
Table 4.4 Height, scale, and mass of secondary building on the 1884 Sanborn maps ..........................42
Table 4.5 Number of attached, hyphenated, and detached secondary commercial, residential, kitchen houses and separate dwellings in 1884 and 1902 ....................................................55
Table 4.6 Secondary and primary building materials found within the walled city in 1902 .................................................................56
Table 4.7 Height, scale, and mass of secondary buildings on the 1902 Sanborn maps ..........................59
Table 4.8 Height, scale, and mass of secondary buildings on the 1955 Sanborn maps ..........................64
Table 4.9 Number of stables and garages present in 1884, 1902 and 1955 ..........................65

Chapter 5: Analysis

Table 5.1 Materials of primary and secondary buildings surveyed within the walled city in 1884 .................................................................73
Table 5.2 Materials of primary and secondary buildings surveyed within
Table 5.3 Materials of primary and secondary buildings surveyed within the walled city in 1902

Table 5.4 Percentages of smaller outbuildings surveyed in 1884, 1902, and 1955

Table 5.5 Percentages of shorter outbuildings surveyed in 1884, 1902, and 1955

Table 5.6 Percentages of enclosure ratios found within the walled city in 1884, 1902, and 1955

Table 5.7 Percentages of matching enclosure ratios between smaller back buildings and main buildings in 1884, 1902, and 1955

Table 5.8 Number of building use types surveyed in 1884, 1902, and 1955

Table 5.9 Showing Sanborn year referenced and number of separate dwellings surveyed

Table 5.10 Showing Sanborn year referenced and number of mixed-use buildings surveyed

Table 5.11 Showing Sanborn year referenced and number of detached dwellings surveyed

Table 5.12 Accessibility percentages from 1884, 1902, and 1955

Chapter 6: Conclusion

Table 6.1 Percentages of properties with multiple access points in 1884, 1902, and 1955
Chapter 1: Introduction

The architectural history of Charleston has great depth that spans more than three hundred years. The properties in this port city have undergone changes which reflect economic, political and cultural evolution. Change is reflected in the city’s buildings, lot element patterning and spatial organization. Lot element patterning is determined by surveying how building placement has changed through the years relative to property lines and street facing and spatial organization explains why buildings are placed where they are and how they are meant to interact with the social environment. Understanding each of these characteristics reveals shifting in attitudes and technology. Moreover, how architecture, lot elements, and spatial patterns change due to the densification and economic shifts that occur within the city are important in understanding Charleston’s history. Appreciating these larger concepts means breaking down the architectural history of the area and looking at the style, placement of the buildings within the walled city as a group and use of the individual buildings in Charleston.

For the purposes of this thesis, an outbuilding will also be discussed using the terms: accessory, auxiliary, secondary, supplementary, back building, or ancillary building. Any building that is not used as the main residence is considered an outbuilding. Typically smaller in scale and located behind the main dwelling, these buildings are purpose-built and used for day-to-day work and as living quarters. Specifically, this thesis uses Sanborn Fire Insurance maps to assess change within Charleston’s walled city neighborhood between 1884 and 1955. The year 1884 is the first year the Sanborn Map and Publishing Company issued insurance maps.

Examination of these properties forms a better understanding of the evolution of Charleston’s urban outbuilding and how they relate to their primary building as the city adjusted to post-war depression, the twentieth-century economy, and household technology. The analysis
reveals trends and relationships that exist within the layout of the historic walled city. A complete longitudinal survey of property evolution within the walled city boundary has never been completed and will offer new insight into accessory building patterns and trends found in architectural styles, construction techniques and property element layout.

The survey area of this thesis lies within the historic walled city. The city’s fortifications were erected to defend against Spaniards, indigenous people and pirates threatening the new colonized Charles Town. The need for these walls slowly dissipated and the wall was dismantled, but Charleston’s development in this area continued to be shaped by these protective walls. The walled city includes every property north of Water Street, south of Cumberland Street, east of Meeting Street and west of East Bay Street (see Figure 1). These four streets which replaces the footprint of the wall houses the oldest buildings of Charleston. This early settlement was characterized as having wide and spacious dirt streets and offered a grand aesthetic to the buildings that fronted them. At this time the city consisted of thirty homes and only 200 people with few people emigrating into the area up until 1700.

Early Charles Towne was a major merchant. The city was a trading center for materials and products, including deerskins, provisions, rice and indigo. Up into the early eighteenth-century the city consisted of land between the Cooper River and Meeting Street (the small area within

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the fortified historic walls) and as planters and politicians moved into the area, the economy evolved and Charles Town expanded in a way the infrastructure was not prepared for. This influenced a lack of general neglect to the city streets and fires became a major problem. Additionally, the city lacked strong governance, leading to major crime issues.⁴

From its establishment in 1670, Charleston was a growing and densifying town. During the 1820’s and 1830’s the city experienced architectural, political and social growth. The historic city walls were removed, development on the peninsula’s urban fringe began and the city’s fire protection and prevention methods became more reliable. These methods include the enforcement of a city run fire department, the incorporation of fire insurance and the use of fire-resistant building materials. With these newly incorporated approaches, the integrity of the city was characterized by mansions representing innovative construction practices and economic

prosperity. However, Charleston is also representative of hardship and conflict. Studying the area that was once bound by the fortification wall, while distinct from other neighborhoods, can be used to measure architectural, material and spatial change of outbuildings between 1884 and 1955.

This thesis survey asks twelve questions to determine: First, what are the architectural relationships between secondary and primary buildings? Second: What are the property element arrangements and trends? The data compiled to answer these inquiries addresses one larger question: “How did lot element patterning and the architecture of secondary buildings evolve within the walled city between 1884 and 1955?” A review of secondary literature on outbuildings in Charleston will give context for the early years of development. Detailed study of Fire Insurance maps determines how secondary buildings are related to their primary buildings from 1884 to 1955. Spatial patterning is examined on a micro scale using property elements. Each property is individually studied to determine how building elements interact with each other and property accessibility of each property within the historic walled city. Back building is analyzed at a macro level to determine overarching connection relationships between main and back buildings within the walled city.

The walled city houses the earliest forms of architecture and remains the oldest historic district in Charleston. This thesis creates an inventory of the materials, design practices and use of the outbuildings within the walled city between 1884 and 1955. This inventory of outbuildings also presents evolutionary analysis of property element location and spatial relationships between the primary building and the public right-of-way. These survey and analysis methods have not been completed on the buildings within this boundary area and the findings from this thesis show the importance of the urban outbuilding to Charleston’s socioeconomic history. The findings are meant to help guide students, researchers, architects, preservationists and historians in any future investigative research and design new outbuildings consistent with historic patterns.
Chapter 2: Literature Review

Architecture in Charleston is a main source of income to the peninsula’s tourism economy. The variety of styles and eras of construction present are instrumental in explaining the history and social influence in the city from its initial colonization through its history. There is considerable literature available on the iconic architecture of Charleston. However, little attention is given to accessory buildings located behind the big houses. There is a lack of information and research into the evolution of these buildings.

Scholarly works attempt to share the history of South Carolina and explain how the city’s past influences stylistic preferences of the area. This variety of scholarly work specific to Charleston focuses mostly on high style properties around the peninsula. Topics include discussion of architectural styles and evolution of form, styles, common material use, general state history, and the racial power dynamics of the urban landscape. Mostly absent from these studies are secondary buildings. A complete history of the architecture of Charleston cannot be fully understood because of the lack of research and analysis on this type of building. Subject organizes this literary review. Chronologically presented, this form of analysis will show what architectural forms and themes Charleston scholars were focused one and when. Scholarly work written during the twentieth-century was focused more on high style architecture, the historic significance of the owner, and the various architectural styles that are present throughout Charleston. Literature

written after the twentieth-century shows scholars interests lie on individual property elements, material culture and how it can be used to explain the past, and the lives of the working-class and the enslaved people of South Carolina.

**Twentieth-Century**

Focusing on the character of Charleston, its people, and cultural formation, architect Albert Simons wrote *The Early Architecture of Charleston* about preserved classicism and intellectual belief systems based on etiquette, planter populations, Whig aristocracy, and conservatism influences which affect the Lowcountry aesthetic. According to Simons, architecturally, Dutch influence is the most prominent in the city and French taste is incorporated in large civic and commercial buildings. Focusing mainly on the exterior appearance of buildings, Simons only includes changes of interior space when it is relevant to the explanation of the era. For example, Simons described design details that would be used for each architectural style. Federal style design would have simple and classical ornamentation while Victorian style would show an interpretation of revival styles mixed with an introduction of middle eastern influence. These interior details would be found on cornice detail, mantel detail, wall paper design, furniture detail and in many other areas.

Simons discussed the architectural changes that occurred due to social influence and Charleston’s devastation from fires and storms in the seventeenth- through the nineteenth-centuries. Simons notes that the men building the buildings of Charleston, many of which were lost to natural disasters, were not educated architects. Rather, they were trained craftsmen who built based on the traditions of the trade and the knowledge of past failure and success. These craftsmen built a distinct type, a building with thick brick walls covered in stucco with an exterior that is
dictated by the interior layout, leading to a non-symmetrical street front. Important rooms were paneled, molding was bold with simple ornamentation, and the lots themselves were narrow but deep. Each property consisted of a large dwelling house butting the street with additions and dependencies (kitchen, washrooms, slave and eventual servants’ quarters, and stables) receding to the back of the lot. Simons notes that the buildings appeared to have a sense of frankness in functionality. Simons attributes the progression of social influence to changing building style and influencing the properties layouts. This is the first and only reference to secondary buildings in Simons’ *An Architecture of Charleston*. While this work briefly touched on the functional accessory building, Simons reverts to explaining the layout of the main dwelling houses. Throughout the rest of the book, Simons continues discussing the economic events that influenced building construction, the social aspects that effected architectural exploration, and details of the various periods of architectural style. The book included several photos with each period. Simons wrote a time line of architecture based on universally known historic events such as the revolutionary war and industrialism rather than architectural eras of style like the Georgian and Federal Periods. More specifically, he explains why architecture changed because of outside influences.

One year after *An Architecture Guide to Charleston* was published, Albert Simons worked with the Historic Charleston Foundation to compile a manuscript including architectural descriptions of the buildings of Charleston and organized them based on construction date in *An Architectural Guide to Charleston*. Simons, once again, used a timeline based on historical events: the colonial period, the post-revolutionary period, the anti-bellum period, the post-civil war period, and buildings for future inclusion. Simons’ introduction touched on the contribution of the single

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house by the Charleston craftsmen, climatic forces that affected the peninsula and general building characteristics.

Concluding the building history of the area, Simons discussed the number of disasters that have hit the city, including sixteen fires, fifteen storms, and the 1885 cyclone followed by the 1886 earthquake. The book explained the increase in the rate of demolition after World War II and the increase in new construction that led to a more stable downtown and suburban expansion. As the rate of new construction continued to increase and historic properties were at risk, this book was meant to show the existing architectural gems from the colonial to the post-civil war that needed attention. Rather than using detailed building descriptions, Simons used the history of the famous property owners.

Written descriptions provided by Simons included homes of well-known Charlestonians. Property layout and outbuildings were rarely mentioned. Describing the John Stuart House, c. 1772, 106 Tradd Street, Simons stated, “He [John Mead Howells] provided a flight of brick steps from the center of the bay on the first floor into the garden. On the Tradd Street side he built a brick wall and created a formal French garden to the west of the house.”7 This was the most descriptive information on the properties outbuildings. A possible explanation for Simons’ omission is because his book revolves around the format and architecture of the primary building and the property elements used for social gatherings, which included the main house and the garden but not the back buildings. Up to the 1970’s, the architectural research of Charleston revolved around the buildings owned by historically relevant men and women and did not touch on accessory buildings or how they related to their primary building, stylistically, spatially, or otherwise.

Samuel Stoney worked with The Carolina Art Association to write and compile *This is Charleston*, which described all the character rich buildings of Charleston. Based on the premise that new construction was lacking in the purposeful, nostalgic charm that historic buildings exude, Stoney worked to pull together a set of building photos representing five groups of architectural value: nationally important, valuable to the city, valuable, notable, and worthy of mention. Unlike other guides, the buildings were organized by street name in alphabetical order rather than by construction era. Another characteristic of this work differentiating it from other resources is the inclusion of buildings based on their construction and stylistic qualities rather than their relation to a historic figure. High style architecture, middle-class dwellings, and outbuildings comprise *This is Charleston*. Located at the back of the book, Stoney includes comments and photos organized by: age; geographic distribution; by Old and Historic area and South of Broad; by boroughs between Broad and Calhoun St, between Calhoun and Boundary St; and by building use. This analysis does not differentiate outbuildings from dwelling houses, but the Stoney aid includes photos of secondary buildings set apart from their main house (see *Table 2.1*). Stoney stated, “It is hoped that this book will be used by you as a running reference, or rather, a walking one.”\(^8\) Stoney is encouraged visitors and locals to go to these locations to see Charleston’s rich architectural history and to get a better understanding of the significance of these buildings. Stoney premised that observing these sites in person will make a stronger impact than simply reading about them or seeing a photograph.

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\(^8\) Samuel Gaillard Stoney, *This is Charleston* (Charleston: Carolina Art Association, 1960), 5.
Table 2.1: Address, building type, and current state (as of publication date) of accessory buildings mentioned by Samuel Gaillard Stoney in “This is Charleston.”

<table>
<thead>
<tr>
<th>Address</th>
<th>Building Type</th>
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<tr>
<td>61 Ashley Ave.</td>
<td>Gate &amp; Stable</td>
<td>Still Standing</td>
</tr>
<tr>
<td>192 Ashley Ave.</td>
<td>Stable</td>
<td>Altered</td>
</tr>
<tr>
<td>91 Beaufain St.</td>
<td>Accessory Building</td>
<td>Gone</td>
</tr>
<tr>
<td>108 Beaufain St.</td>
<td>Accessory Building</td>
<td>Still Standing</td>
</tr>
<tr>
<td>261 Calhoun St.</td>
<td>Accessory Building</td>
<td>Gone</td>
</tr>
<tr>
<td>276 Calhoun St.</td>
<td>Kitching Building to #274</td>
<td>Still Standing</td>
</tr>
<tr>
<td>75 Church St.</td>
<td>Warehouse &amp; Stable</td>
<td>Still Standing</td>
</tr>
<tr>
<td>1st National Bank</td>
<td>Kitchen Building</td>
<td>Improved</td>
</tr>
<tr>
<td>134 King St.</td>
<td>Kitchen Building</td>
<td>Gone</td>
</tr>
<tr>
<td>69 Meeting St.</td>
<td>Carriage House</td>
<td>Gone</td>
</tr>
<tr>
<td>271 Meeting St.</td>
<td>Accessory Building</td>
<td>Gone</td>
</tr>
<tr>
<td>281 Meeting St.</td>
<td>Carriage House</td>
<td>Gone</td>
</tr>
<tr>
<td>45 Queen St.</td>
<td>Servants Quarters</td>
<td>Improved</td>
</tr>
<tr>
<td>46 Queen St.</td>
<td>Accessory Building</td>
<td>Still Standing</td>
</tr>
<tr>
<td>94 Rutledge Ave.</td>
<td>Kitchen Building</td>
<td>Improved</td>
</tr>
<tr>
<td>122 Smith St.</td>
<td>Kitchen Building</td>
<td>Gone</td>
</tr>
<tr>
<td>61 Vanderhorst St.</td>
<td>Summerhouse</td>
<td>Gone</td>
</tr>
<tr>
<td>59 Wentworth St.</td>
<td>Originally Accessory to German Artillery hall</td>
<td>Gone</td>
</tr>
<tr>
<td>138 Wentworth St.</td>
<td>Bath house</td>
<td>Still Standing</td>
</tr>
</tbody>
</table>

This table compiled using Stoney’s This is Charleston shows outbuildings historically had a variety of uses and were found throughout the peninsula. Rather than just studying the walled city, Samuel Stoney’s boundary area is the whole peninsula. This table shows outbuildings were used throughout the city and not localized in just one area. While some of these buildings remain standing and have even been improved from their original condition, over fifty percent of these buildings have been demolished or altered from their original appearance. Discussing these buildings, building location, building use and current state show readers building relevance to the city and the lack of effort that has occurred in keeping them standing or keeping their historic integrity intact.

Robert Rosen wrote A Short History of Charleston in 1982 to discuss the history of Charleston. Rosen recounts the city’s history based around historically significant events such as
the city’s settlement, the American Revolution, secession, the Civil War and the reconstruction era. While this book only briefly discussed architecture and city planning, the history of the area is a major influence on construction evolution of the area and important to understand for this thesis. Rosen is also one of the only authors who discussed the lack of acknowledgment given to the working people of Charleston by stating, “It is a sad fact of history, however, that usually only the educated, powerful, and wealthy leave diaries, letters, and newspaper accounts, and it is from these sources that our knowledge of history is primarily drawn.” With this statement Rosen emphasized the lack of knowledge on Charleston’s ship builders, tanners, shoemakers, carpenters, silversmiths, coopers, slaves and others is due to insufficient research from these lower-class men and women.

Author Mills Lane wrote *Architecture of the Old South* on the topic of architecture in the state of South Carolina. Written as a narrative, Lane discussed the periods of architecture found in Charleston and in surrounding areas. All presented under a larger umbrella, periods of architectural style differentiate the sections in this novel rather than historic events like Albert Simons work.

Mills Lane touched on urban and rural architectural influence which opens the scope to homes owned by non-affluent Charlestonians. It is during this section of the book, *Across the Frontier*, where unassuming historic buildings are given credit for their significance. Crude and simple in floor plans and elemental details, the Carolina frontier houses were utilitarian buildings constructed with complicated joinery and could not be constructed larger than the trees used to build them. Lane went into much more detail explaining the construction of these log cabins, explaining the layout of the logs, mortis and tenon connections, notched joint corners, and the simplicity of rural building design.

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Unlike authors like Albert Simons and Samuel Stoney, Mills Lane included more depth in his architectural descriptions of urban and rural Carolina buildings. Rural and plantation architecture is included, along with floor plans, photos, and drawings which expands the conversation of style and architectural trends. Other than the slight detour he took to the frontier, Lane discussed only buildings owned by the elite, excluding accessory buildings and buildings owned by the lower class. Details into the construction of these building types and the various techniques for each period shows the focus was more on the relationship of architectural construction and style rather than historic events and style. While the history of Charleston is included, it is only briefly discussed and incorporated when it is significant and is the main cause for many architectural changes within society.

Research and books written from 1970 to 1989 are heavy with photographs and present generic historic facts needed to place the reader within the city’s context. Samuel Stoney’s book *This is Charleston* is one of the only books that makes clear comments on the need for architectural preservation and conservation practices in Charleston. It is not until the 1990’s that historians and researchers begin to discuss working class Charlestonians and the environment they lived in throughout history.

**Twenty-first Century**

Toward the end of the twentieth-century researchers and authors began to include new topics when writing about Charleston, South Carolina. Charleston history continued to be a major influence but archaeological research and more theoretical ideals were studied and discussed. For example, Martha Zierden, an acclaimed archaeologist based in Charleston, discusses property layout as the basis of her studied when determining property interaction between owner and
worker. Specifically, she analysed the layout of high style properties by excavating and studying the zone stratigraphy to determine the layout of various functions and uses on site and which areas of the property would have been used formally and which would have been designated to the work of enslaved people in her analysis of elite townhouse sites. Zierdan used multiple archaeological projects to develop the theory that “the spatial patterning at these urban sites underscores the problems faced by urban residents and the attempts of the upper class to cope with these conditions.”¹⁰ According to Zierden, and other acclaimed scholars, archaeological research suggests that property layout and building orientation changed due to increased fear after the 1822 Denmark Vesey insurrection. Owners of the enslaved workers increased property surveillance and decreased private space of the enslaved to ensure uprisings did not occur again. Successful surveillance practices included the ability to see every building and all the yard space from multiple vantage points from inside the primary building and having visitors and workers interact with the primary building when entering the property. These two forms of surveillance allowed the property owner to know who, when, and where visitors and workers were at all times, reducing the chances of private meetings and personal freedom. Though archaeological scholars work has created a more in-depth analysis of the outbuildings in Charleston, the basis of their research was to study the racial tensions and create a better understanding of segregation. While it is important in understanding the dynamics of property element layout, slavery and racial power dynamics are not the focus of this thesis.

The end of the twentieth-century marks a period when historians attempted to look outside of the wealthy Charlestonians and pursue research into the lives of the workers and slaves of the city. In Walter J. Fraser’s Charleston! Charleston! The History of a Southern City, the

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development of Charleston from 1670 to 1989 was explained including every facet of the port life, from its people to the architecture. Fraser’s book gave relevance to every social, political and cultural aspect of Charleston society, one of the only books that included the history of the wealthy and the working class and how they interacted.

In *The Buildings of Charleston: A Guide to the City’s Architecture*, Johnathan Poston wrote about the architecture of individual buildings with a brief property history and the famous Charlestonian who owned the house during its construction. Organized chronologically and followed by neighborhood influence, Poston began within the walled city. As described by Poston, a variety of materials were used to construct inside the walled city: timber, tabby, imported Bermuda stone, and brick. The earliest dwellings were of asymmetric plan and either two or four rooms per floor. Poston’s focus in this book was in the Old and Historic District. The only other reference to property layout was of large merchant buildings which had commercial space on the bottom floors and residential space on the top floors, a mixed-use building in today’s terms. Poston discussed a variety of building types and sites (commercial, civic, gardens, etc.) and only discussed a few properties to represent the domestic architecture in the Old and Historic District. The Lining House, the Harvey House, the Ramsey House, and the house-plan shop and dwelling of Peter Bocquet were a few mentioned. Poston excluded detailed descriptions of secondary buildings and property layout in these residential property descriptions.

It was not until Poston discussed the nineteenth-century that he began discussing how lots were planned. With the implementation of Charleston’s design guidelines in 1931, any property changes, reorganization, alterations or demolition that affected the historic aesthetic of the area, had to be approved by the Board of Architectural Review. These strict regulations increased property planning and the organization of individual building elements by property owners because owners had to present conceptual, preliminary and finalized plans to the city for approval of
changes they planned to make. Throughout *Buildings of Charleston*, Poston discussed individual property elements, excluding property arrangement until he discussed the Ansonborough neighborhood. In this chapter the author described properties as more than individual dwelling houses, stating, “The architectural masterpieces of the area, lay northwest of its heart, at Meeting and George Streets, where corner mansions built by Thomas Radcliffe and Gabriel Manigault vied for superlatives with adjacent villas.” Poston discussed the importance of using primary and secondary buildings to create a cohesive property. More specifically, Poston referenced the 1838 fire that destroyed most of the Ansonborough neighborhood and described during the reconstruction of the area, “Building contractors and investors built entire rows of single houses as well as a few attached dwellings.” This is the first direct comment on auxiliary buildings and they were built attached to the main buildings rather than free standing.

Though the history of outbuildings in Charleston is underrepresented in the literature, literature focused on outbuildings in other places exists. This literature referenced many forms and types of buildings as accessory buildings. Back buildings consisted of carriage houses, barns, ice houses, laundry houses, kitchen houses and smokehouses. Most of which were seen in rural environments. While evidence of stables, barns, kitchen and laundry houses do exist within the urban environment, more literature is written on outbuildings found on rural plantations. Information from various sources includes: detailed descriptions, site plans, buildings orientation, documented studies. More specifically, Donald Berg in *American Country Building Design*

12 Ibid, 412.
included floor plans with a brief description of building purpose, along with an explanation of the itinerary of the building (see Figure 2.1). These rural architectural forms can be juxtaposed to their urban counterpart because each was built in specific ways because of their environment. While the rural outbuilding is not the focus of study, books discussing rural buildings and properties with multiple buildings must be analyzed because urban outbuildings have relationships to rural accessory building.

Figure 2.1: Graphic and carriage house plan provided by Donald J. Berg, “American Country Building Design” (1997).

Archaeological research completed in the past decade on urban landscape evolution have brought scholars a step closer to outbuilding research. Scholars’ past and current archaeological investigations are typically completed on late eighteenth- and early nineteenth- century residential sites. This research focuses on the correlations of property landscape and social relations between
master and slave.\textsuperscript{14} Discovering more information on slave and servant housing in the urban environment has led to the universal belief that “relationships and power dynamics that in combination possess a unique and definable character as a whole, simultaneously collective and contradictory.”\textsuperscript{15} The research on property organization and element orientations’ influence on surveillance have led to a better understanding of Charleston’s urban auxiliary buildings.

Many scholars discuss property layout when describing property owner’s need for security and surveillance implementation, which includes descriptions of buildings on site. Herman’s work in \textit{Slave and Servant Housing in Charleston, 1770-1820} focused on element orientation of high-style properties and how they were organized and planned for surveillance of the property owner’s slaves. In this work, Herman clarified:

The organization and building architecture varied based on lot size, economic income and number of property workers. Regardless of these considerations, the Charleston urban lot is defined by the dwelling with all its attendant buildings. Furthermore, access onto a Charleston’s townhouse compound included multiple forms of entry and directed traffic of various levels of formality. Property element orientation ran from the main street to the back of the lot in a pattern of descending formality.\textsuperscript{16}

Herman provided evidence for these assertions by describing the layouts and building character of outbuildings on 22 Elliot Street, the Heyward-Washington house’s kitchen house, the Robinson kitchen house, the Aiken-Rhett kitchen house, the Edmund Petrie house and outbuildings, the


\textsuperscript{15} Martha Zierden, “Landscape and Social Relations at Charleston Townhouse Sites (1770-1850),” \textit{International Journal of Historical Archaeology}, Vol. 14, No. 4 (December 2010), 528.

Robert Geddes and Michael Cromley houses and outbuildings, the Charles Frish house and bakery and the Benjamin Smith commercial premises and outbuildings. Supporting Herman’s beliefs in the relevance of the urban outbuildings is Martha Zierden, whose archaeological study focused on social values and relationships between owner and the enslaved.

Margaret Moore wrote *Complete Charleston: A Guide to the Architecture, History and Gardens of Charleston and the Low Country* as an architectural guide meant to lead tourists through the Old and Historic District. The guide covers neighborhoods, boroughs, ecclesiastical buildings, bars, restaurants, and coffee shops. This book is a step-by-step tour of Charleston informing visitors the best places to visit during their vacation. Moore included brief histories of architectural styles seen on the peninsula. The author introduced the Colonial style, the Federal (Adams) style, the Greek Revival and the Victorian Period with an example of architects practicing during each period, specific buildings for each period, and building elements to look for during the tour. Focusing more on high style buildings, Moore briefly discussed the organization of the single house stating, “The single house: block and attached piazzas, does not stand alone. It is invariably connected to a yard that extends the open space of the piazza over to the next house…the ensuing rhythm is immediately apparent; house, piazza, yard, house, piazza, yard.”

The tour itself focused on areas all around Charleston but included buildings with historically relevant backgrounds. An entry stop from the Ansonborough chapter described, “72 Anson Street: One of the most beautiful gardens in Charleston can be glimpsed through the fence.” This stop on the tour has a less prevalent history and is an example of how Moore attempted to explain the buildings that lack a famous Charleston figure.


18 Ibid, 118.
Some of the most descriptive references to accessory buildings are found in, Alice Huger Smith and her father D.E. Huger Smith’s co-written work *The Dwelling Houses of Charleston* from 2007. This book focused on the stylistic evolution of dwelling houses in Charleston, South Carolina, and referenced outbuildings to contextualize the layout and function of properties. The Smiths’ described the layout of the Huger House property, explaining:

The building we are now considering is a double house above a high cellar, and a flight of stone steps leads from the street to the front door, through which is entered the hall. This runs through to the back door, where another flight goes down into the yard, which, in the old days, had on one side the kitchen and on the other the carriage house and stables, both large brick buildings with second stories; and beyond lay the garden.\(^{19}\)

The description of the accessory buildings in this reference were used to orient the reader if they were leaving the Huger House and entering the back of the property. A following example of outbuilding description is of the James Parsons House, a member of the Provincial Congress and of the Secret Committee of 1775. Attention was given to the outbuildings when the authors affirm, “The kitchen is detached from the house with two large rooms below and four rooms above. It’s windows, as well as those of the other outhouses and of the carriage house at the back of the lot, have the pointed arch, which seems to have been not unusual at that time.”\(^{20}\) This is not the sole reference the Smiths’ make in terms of the specific building characterization. The Brewton-Alston-Pringle House’s “large outbuildings of brick and the garden and kitchen courtyard show the same careful finish in design and execution” show thought went in to the exterior design of the outbuildings to create conformity on the property.\(^{21}\)

\(^{19}\) Alice R. Huger Smith and D.E. Huger Smith, *The Dwelling Houses of Charleston, South Carolina* (Stroud: The History Press, 2007), 42.

\(^{20}\) Ibid, 32.

\(^{21}\) Ibid, 48.
The Smiths’ argue that secondary buildings were all given consideration during their construction by referencing the site layout and architectural style. However, this thesis will show while style conformity was essential and common for high style properties, this does not prove the secondary buildings were built with the same comforts as their main house. While secondary buildings were not deemed as important as their primary buildings during construction, the notion that property owners’ may have had intent uniformity informs and drives the following thesis investigation.

Michael Olmert provided additional outbuilding descriptions in his book *Kitchens, Smokehouses, and Privies*. Each chapter centered on an outbuilding type, and Olmert provided a descriptive history to explain the evolution of each structural form. The original use of each building type was fully examined, including its integration into American society. An excerpt explaining how “detached kitchens fell out of use after Henry VIII dissolved the monasteries in 1536-39,”22 shows the depth Olmert included when describing each secondary building type. Olmert also offered a generalized history of the building systems by including architectural descriptors. He rarely discussed relationships that might exist between primary and secondary buildings. Additionally, the concept of the urban domestic accessory building was not specifically referenced; Olmert’s research is based only on rural plantation outbuildings. Instead, Olmert chose to provide a general history of “the kitchen,” “the laundry,” “the smokehouse,” “the diaries,” “the privies,” and “the offices.” Olmert’s work provided the most detail of outbuilding layout, architecture and use.

Written in the past year, Gina Haney joined six other authors to write *Slavery in the City*. This book discussed different characteristics of architecture and landscapes of slavery in the urban

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environment throughout North America. Specifically, Haney deliberated how light, sound and action effected Charleston’s antebellum backlots. This book provided insight into the urban domestic space, the organization of property elements, the purpose of accessory buildings and how these buildings were meant to interact with the main building through the workings of the property’s enslaved workers. These concepts offer innovative thinking by analyzing how more theoretical ideas like sound and light affected urban properties. This work is evidence that research is expanding and new avenues are being explored in reference to enslaved workers’ living conditions, day-to-day interaction, characteristics of post-antebellum environment and the townhouse property layout in Charleston.

Scholarly work that discusses Charleston architecture, in the past, has been relegated to very specific topics. These topics include building style, relevance of building owner, and any changes to the property that have occurred through the years. These topics are all influenced by the history of the area and how history influences economic expansion and architectural design preferences. During the 1980’s we begin to see historians encourage citizens to pursue preservation practices for Charleston buildings, but we see little remark on the history or importance of back buildings. The end of the twentieth- and into the twenty-first century authors, archaeologists, and historians publish work on property layout, the use of surveillance before and after the emancipation, the significance of understanding the history of the Charleston’s enslaved and working class and understanding the importance of the buildings they lived and worked in. This subject matter is opening new aspects of Charleton history that was not being analyzed before. Having a more comprehensive knowledge in all these areas will create a more knowledgeable community and can influence preservation decisions.
Chapter 3: Methodology

This study investigates architectural features and building location to understand the evolution of outbuildings within the walled city of Charleston. The data collected from the Fire Insurance Maps of 1884, 1902 and 1955 yields an understanding of how primary and secondary buildings were architecturally related and how these secondary buildings have adapted through time. In addition, this data collected will expose any trends which influenced property layout of these historic properties.

The study area of this thesis is the historic walled city of Charleston (see Figure 3.1). Every property east of Meeting Street, west of East Bay Street, south of Cumberland Street and north of Water Street was surveyed. The area within the walled city contains the oldest architecture and will provide a collection of data to show how buildings and properties in Charleston have changed through time. To study the history of Charleston’s outbuildings it is necessary to choose a sample area that adequately shows architectural evolution. The first and oldest area colonized on the peninsula, the walled city was established in 1672 and “each grantee of these first lots [Charles Town city lots] was required to build a house of two stories in height and at least 30 feet by 16 feet in dimension.” A fortification that shaped the city’s original architecture, these four blocks were a strong influence for the rest of the city. Even though “almost all of the earliest buildings have disappeared” and the walls no longer stand, the properties that reside within the wall’s footprint

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24 Ibid, 47.
provide a better understanding of the urban development of the Charleston outbuilding because they are among the oldest buildings on the peninsula.

The buildings in the walled city represent various architectural styles, a wide range of building materials, high style and vernacular styles, original lot element patterns that helped form the downtown area, as well as change over time. The 1884 map shows each property at its earliest recorded condition by the Sanborn Map and Publishing Company Limited, while the 1902 and 1955 maps allow a picture of property evolution.

Figure 3.1: Map showing the boundaries of Charleston’s walled city provided by Google Maps.
Data

Two sets of questions drive this study. The first set of questions explores the architectural relationships that exist between primary and secondary property elements while the other set focuses on building layout and placement to determine spatial trends. The data collected to answer these questions has not been collected before, and increases knowledge of the buildings that provided live and work space for the working-class in Charleston. Asking questions of each property within the historic walled city area provide the data to answer architectural and spatial research investigation questions. The first set of questions focus on comparative analysis of the architecture of a property’s primary and secondary buildings. The focus is on the construction methods used for each ancillary building and how they relate to their primary building. Building material, enclosure ratio, height, scale, mass and building use will all be recorded to determine if the outbuildings were constructed purposefully on site with a similar architectural language to the main property building, a practice evident in high-style urban plantations.25

The architectural investigation focuses on how the primary and secondary property buildings are related is driven by nine questions:

1. What is the main material of the secondary building?
2. What is the main material of the primary building?
3. What is the height of the secondary building in comparison to the primary?
4. What is the scale of the secondary building in comparison to the primary?

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5. What is the massing of the secondary building?

6. What is the enclosure ratio of the secondary building?

7. What is the enclosure ratio of the primary building?

8. What is the use of the secondary building?

9. What is the use of the primary building?

In the Survey123 section below, these questions will be discussed in further detail. Moving the focus on the investigation of element layout, the spatial analysis questions help examine property planning and accessibility embedded within each individual property and further, at the macro scale, to determine if the discovered patterns exist universally during each surveyed year. There are three questions that will help determine these trends:

1. How is the secondary building attached to its primary?

2. Where is the secondary building located on the property?

3. How do you access the secondary building?

Answering these twelve questions builds an extensive survey. The survey was done using the Survey123 platform with a set of questions meant to provide a general assessment of building appearance and layout to create an inventory for analysis and future research.26 The data was collected using Survey123 and further analysis was completed using ArcGIS online.

Survey123

Survey123 is a user interface for which questions were answered based on a personalized survey. This survey was used on every property located within the footprint of the walled city. The

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oldest colonized area on the peninsula produced an area of study with one of the largest varieties of architectural styles and building use. The Sanborn Maps were used to furnish all the information needed to answer the survey questions.

Before collecting the data for each of the properties, two additional information fields were completed:

1. What is the property address?
2. What is the Sanborn Map referenced?

These two facts were necessary information so the property could be placed accurately on the GIS map and to know which Sanborn map was being used when the outbuilding was being surveyed. Providing the property address created a geolocation of each property; ArcMap locates the property using the latitude and longitude of the given address which can easily be transferred into ArcMap online (see Figure 3.2). Each of these geolocations are points that constitute an individual building on a property and will create a final shapefile. A shapefile is a format for storing the geometric location and attribute information of geographic features.27 For the purposes of this thesis, the shapefile will be represented as a point, however they can be shown as lines or polygons.

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After the address was entered, the reference map was chosen (1884, 1902 or 1955). The correct Sanborn map had to be chosen so the properties could be differentiated during analysis in ArcMap. The correct Sanborn map had to be included to accurately represent outbuildings in each year studied. After these two questions were answered, the architectural characteristics of the primary and secondary buildings within the walled city were input into the survey.

The survey began by asking what the main material of the primary and secondary property buildings were (see Figure 3.3). Determining the material of both the primary and secondary building shows if material symmetry was considered within the walled city when constructing secondary buildings.
Following building material, the height, scale and mass of the secondary building in relation to the primary building was determined. The height of the outbuilding was defined as: shorter, approximately the same height or taller. For the purposes of this thesis, the term scale refers to a more general comparison between the main dwelling house and the accessory building or a basic volume. The surveyed outbuildings are either smaller, bulkier, or approximately the same size as its main dwelling. The term mass appertains to how the building looks in terms of its basic massing. This is a more specific look at the building as opposed to a general identification for scale. In this thesis, outbuildings are defined as rectangular, square, or polygon massing. Polygon massing was used when an outbuilding had multiple extrusions of rectangles or squares such as is present at 15 Tradd Street in 1902 and represented in Figure 3.4. The yellow building at 15 Tradd represents a square massing while the pink building shows a polygon passing. These three questions were used to help compare the basic forms of the property buildings.
Once the building form was analyzed, primary and secondary building enclosure ratio was examined (see Figure 3.5). An enclosure ratio is the open area (windows and doors) to solid wall space. Buildings were constructed during a time when modern conveniences did not exist, things like air conditioning and heating units. The orientation and number of windows and doors were purposefully placed to create ventilation systems and provide comfort to the buildings occupants. This enclosure ratio will study how much attention was given to the comfort of the occupants who lived and worked in the secondary buildings.
The final question used to analyze the architectural relationships between primary and secondary buildings within the walled city are building use of the primary and secondary buildings (see Figure 3.6). Defining building use helped observe how the buildings interacted with each other on each property. Specifically, if secondary building use was influenced by primary use and if the secondary buildings were constructed to support the main building or as completely separate entities.
Once each architectural survey question was answered, property layout was analyzed with three questions which study: building location, attachment, and accessibility. First, how the outbuilding is attached to the primary building was determined. An outbuilding can be attached, detached, attached with a hyphen, or other. Some other forms of connection include: attached with a frame partition, attached to side dependency, attached to side of the primary, attached to the dependency with a hyphen. The data from this question determined how the accessory building connection has changed over time.

The final two questions are meant to analyze whether building layout evolution is arbitrary or follows trends between 1884 and 1902. The first question asks where secondary buildings were located on the property, if they were located across the street, attached to the primary, at the back of the property, beside the primary, directly behind the primary, directly behind and set back or set back and not directly behind. The last question asks how an individual was meant to reach the accessory building. The person or persons visiting a property can go directly through the primary, through a property breeze-way, through an entrance at the back of the property, from the main street, enter the property from a side entrance leading directly into the back lot or through multiple entrances. All these options were determined based on the layout of the main dwelling and back buildings. The data collected from the completed surveys was downloaded to a map in Survey123 where the data was analyzed further and exported into a separate file format to load into ArcGIS (see Figure 3.7). The data for this thesis was exported as a shapefile and imported into ArcGIS to create maps and perform visual analysis.
ArcGIS Online

Geographic information system (GIS) is a way to “connect people, locations and data using interactive maps.” The survey data was integrated into ArcGIS as a shapefile for spatial analysis. The survey forms of the buildings surveyed appear on the online map as points. Within each point, the collected data for the individual property is stored (see Figure 3.8). ArcGIS at its most basic level is the layering of maps and data, however, Esri, most appropriately describes their GIS program as:

Multiple maps can be used at any given time, including personalized maps like Sanborns or predetermined geographic overlays provided by Esri. After the

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geographic container is fixed, the data is integrated. Similarly to mapping, several data sets can be incorporated into a project. Forms of data include imagery, features and basemaps. Once these two functions have been set, estimates, predictions and the interpretation of findings can be completed to understand relationships and trends.29

This technological form of survey integration identifies potential problems, allows for forecasting, can monitor change, set preferences and manage work through an intuitive system. Rather than using paper surveys and manual data entry, this contemporary form of technology allows for a more focused framework with easily organized layers and visualizations for universal understanding.

Figure 3.8: Map showing shapefile points and the data for one property within the walled city. Provided by ArcGIS Online.

Incorporating historic data onto contemporary maps shows how the properties have changed from their original construction and if they exist today. This combination of data types will create a better understanding of any spatial relationships and patterns that exist. Analysis of the maps created in ArcGIS and charts derived from the tables, determine if any patterns exist in Charleston and what any found relationships mean.
Chapter 4: Data

Late eighteenth-century Charleston included the cultivation of cash crops and the exploitation of the maritime development, which influenced an explosion of growth and, consequently, urban density. The population of Charleston compounded, buildings became larger in size and quantity to house the resident and slave population and workhouse facilities. Kitchens, washhouses, slave quarters, work yards, stables, carriage houses, livestock sheds, privies, and many more purpose-built buildings cluttered the city’s boundaries. “Middle class properties in Charleston and elsewhere were increasingly subdivided and congested,” 30 and placed with little attempt at organized planning and more to fulfill residential need. This increased overcrowding amplified the chance of fire, leading to the destruction of many rebuilt buildings from the fires in the seventeenth and early eighteenth centuries.

Charleston’s nineteenth century expansive economy completely changed Charleston architecture, planning, and public service. Congestion was still a constant issue within the urban complex, however the main building materials used changed from wood to fire resistant masonry so the chance of fire was reduced. Charleston laws were enforced that discouraged the use of frame construction within tight quarters and encouraged properties spatial reconfiguration and upgraded facilities. A very accurate survey map completed by Bridgen’s and Allen in 1852 is what would have been seen in Charleston until the first published Sanborn map in 1884 (see Figure 4.1).

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1884: Architectural Analysis

Building information present on the 1884 map used in this analysis is: roof material, floor height, number of window and door openings, location, building material and building use. Studying the material, form, and enclosure ratio of the secondary buildings in relation to the main building will help determine if architectural uniformity was purposefully attempted between property elements throughout the city.

Noticeable and shown in Table 4.1 is the high diversity of descriptions used for the program of secondary buildings found within the walled city, while a very small range of building use describes the primary buildings. Primary buildings are labeled as: civic, commercial, ecclesiastical, junk, mixed-use, residential, ruins, shanty, shed, stable, and unknown (see Table 4.2). The primary buildings have the highest percentage of commercial and residential use, both comprising 41.39 percent of the total primary buildings surveyed. The publisher of the 1884 Sanborn map even
includes the gender, race, and income that are assumed and associated with the property by pointing out buildings as “Gentlemen’s” clubs, “Fancy” buildings, and “Negro, Old & Rotten” tenements. Of all these various secondary building uses, unknown, commercial, and residential buildings are the highest percentages of occupation at 35.09 percent, 21.5 percent, 13.99 percent, respectively. While unknown is the largest category, secondary buildings serving commercial functions is the next most common. This contrasts with what is associated with brick buildings in the urban landscape today, and thus will be tracked over time in this analysis to see the evolution.

Table 4.1: Secondary building use surveyed from the 1884 Charleston, SC Sanborn Map.

<table>
<thead>
<tr>
<th>Secondary Use</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>173</td>
</tr>
<tr>
<td>Commercial</td>
<td>106</td>
</tr>
<tr>
<td>Residential</td>
<td>69</td>
</tr>
<tr>
<td>Tenement</td>
<td>32</td>
</tr>
<tr>
<td>Stable</td>
<td>30</td>
</tr>
<tr>
<td>Kitchen</td>
<td>22</td>
</tr>
<tr>
<td>Shed</td>
<td>17</td>
</tr>
<tr>
<td>Old</td>
<td>12</td>
</tr>
<tr>
<td>Mixed-use</td>
<td>9</td>
</tr>
<tr>
<td>Civic</td>
<td>6</td>
</tr>
<tr>
<td>Ecclesiastical</td>
<td>4</td>
</tr>
<tr>
<td>Barn</td>
<td>4</td>
</tr>
<tr>
<td>Shanty</td>
<td>2</td>
</tr>
<tr>
<td>“Negro” Residential</td>
<td>1</td>
</tr>
<tr>
<td>“Negro, Old &amp; Rotten”</td>
<td>1</td>
</tr>
<tr>
<td>Beer Storage</td>
<td>1</td>
</tr>
<tr>
<td>Bowling Alley</td>
<td>1</td>
</tr>
<tr>
<td>Confederate Widows Home</td>
<td>1</td>
</tr>
<tr>
<td>Hot House</td>
<td>1</td>
</tr>
<tr>
<td>Junk</td>
<td>1</td>
</tr>
<tr>
<td>Number</td>
<td>493</td>
</tr>
</tbody>
</table>
Table 4.2: Primary building use surveyed from the 1884 Charleston, SC Sanborn Maps.

<table>
<thead>
<tr>
<th>Primary Use</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>125</td>
</tr>
<tr>
<td>Residential</td>
<td>125</td>
</tr>
<tr>
<td>Unknown</td>
<td>19</td>
</tr>
<tr>
<td>Mixed use</td>
<td>14</td>
</tr>
<tr>
<td>Civic</td>
<td>5</td>
</tr>
<tr>
<td>Ecclesiastical</td>
<td>5</td>
</tr>
<tr>
<td>Stable</td>
<td>3</td>
</tr>
<tr>
<td>Shed</td>
<td>2</td>
</tr>
<tr>
<td>Shanty</td>
<td>2</td>
</tr>
<tr>
<td>Junk</td>
<td>1</td>
</tr>
<tr>
<td>Ruins</td>
<td>1</td>
</tr>
<tr>
<td><strong>Number</strong></td>
<td><strong>302</strong></td>
</tr>
</tbody>
</table>

When considering the use of both primary and secondary buildings together, the dominant pattern is of reinforcing functions. This means that the program of the primary and secondary building is the same. For every commercial secondary building surveyed ninety-seven percent of their main dwelling was also a commercial building. Additionally, for every residential secondary building surveyed, eighty-five percent of their main dwelling was likewise residential and fifteen percent of their main dwelling was used commercially. Presumably the owner of the enterprise could live behind the business of the same property; this is not definitive. The data suggests that the function or use of the main building in 1884, matches the use of the secondary building in more than ninety-five percent of the cases surveyed within the historic walled city’s footprint. Buildings considered “special” are also demarcated with the main building material. The Sanborn Map Company “identifies major businesses, public buildings, factories, or other large buildings”\(^{31}\) as special. This distinction allows for more complex information to be conveyed and is meant to provide insight into the major economic players in the city. While “special” is used to signify

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building use, the Sanborn maps represent this type of building by color, similarly to how building materials are differentiated. This is an important finding, because it shows the use of color coding is used for more than just material representation.

Unlike building use, which has twenty distinct characterizations, materials in 1884 were more limited. The only materials used in the walled city and were recorded on Sanborn maps were masonry and wood. Of the buildings surveyed, brick is used to construct 83.44 percent of the primary buildings and 64.71 percent of the secondary buildings (see Appendix A). It is the most common form of construction found within the walled city because building materials were historically important because craftsmen built for quality and strength. Due to the lowcountry’s long cooling system, masonry construction was used to moderate and maintain constant buildings temperatures. Brick, stone and tile have high thermal mass values, which prevents temperature fluctuations and keeps the interior cool.32

Masonry’s ability to regulate its temperature and its fire-resistant quality make it an attractive construction material and is used to construct most of the buildings in 1884. Brick is also a more expensive material, so it makes sense to prioritize front buildings. The secondary buildings in 1884 show brick as the main building material but there are also two instances of stone construction. One of these is a commercial building and the other is labeled as “junk.” When looking at use and materials together, brick was also used to build 100 percent of the secondary civic, ecclesiastical, and kitchen houses, 79.71 percent of the known residential buildings and thirty percent of the stables in town, Appendix A. This tells us that brick was believed to be the best material to use for construction of commercial, residential, religious buildings, kitchen houses and for animal storage.

Masonry material is so dominant during this period that 59.22 percent of the time, a secondary and primary building were built with the same brick material. Of the masonry primary buildings, 96.69 percent had brick back buildings. This is a higher percentage of the overall average, therefore there is consistency in back buildings being constructed with brick. Instances occur where the property owner built the secondary building with different materials. Seen in Table 4.3, for every brick primary building surveyed, 20.95 percent of their outbuildings were frame construction. Furthermore, for every frame primary building surveyed, 56.58 percent of their outbuildings were also frame construction, 34.2 percent were brick, 7.89 percent were combination of brick and frame and 1.32 percent was built of stone. Of the brick primary buildings with a brick secondary building, twenty-one had a kitchen function, again reinforcing the use of brick in buildings where there was a high danger for fire.

Table 4.3: Primary and secondary materials found on the 1884 Charleston, SC

<table>
<thead>
<tr>
<th>Primary Materials</th>
<th>Brick and frame building</th>
<th>Brick building</th>
<th>Frame building</th>
<th>Stone building</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brick</td>
<td>31</td>
<td>282</td>
<td>83</td>
<td></td>
<td>396</td>
</tr>
<tr>
<td>Frame</td>
<td>6</td>
<td>26</td>
<td>43</td>
<td>1</td>
<td>76</td>
</tr>
<tr>
<td>Brick Special</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Brick &amp; Frame</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Frame Special</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>41</td>
<td>319</td>
<td>131</td>
<td>2</td>
<td>493</td>
</tr>
</tbody>
</table>

The next analysis to follow from the 1884 map is on how primary and secondary buildings relate in terms of height, scale and mass. Presented in Table 4.4, the mass of every secondary building surveyed is a rectangular or square shape, with “polygon massing” characterizing buildings with multiple element clusters, extrusions, and/or rectangles and squares. The height and scale of
the secondary buildings are very significantly linked; of the secondary buildings noted as smaller in scale than the primary building 79.12 percent are also smaller in height. The buildings with approximately the same scale are 53.03 percent similar in height. A building labeled as half a story shorter or taller than the primary building is considered similar in height. The bulkier secondary buildings are 57.58 percent similar in height and show the highest percentage of taller secondary buildings, 21.21 percent. This tells us that secondary buildings are influenced by primary building form. Secondary buildings are designated as aesthetic to the main property building so secondary buildings will more often built smaller and shorter in size.
Table 4.4: Height, scale, and mass of secondary buildings on the Charleston, SC 1884 Sanborn Maps.

<table>
<thead>
<tr>
<th>Height, Scale Mass of Secondary to Primary Buildings</th>
<th>Height</th>
<th>Scale</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Unknown</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Rectangular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulkier</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Same height</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Rectangular</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Square</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Shorter</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Rectangular</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Taller</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rectangular</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Square</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Approximately same size</td>
<td>66</td>
<td>66</td>
<td>66</td>
</tr>
<tr>
<td>Same height</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rectangular</td>
<td>28</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Square</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Shorter</td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Rectangular</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Rectangular</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Smaller</td>
<td>388</td>
<td>388</td>
<td>388</td>
</tr>
<tr>
<td>Same height</td>
<td>51</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Rectangular</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Square</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Shorter</td>
<td>307</td>
<td>307</td>
<td>307</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Rectangular</td>
<td>212</td>
<td>212</td>
<td>212</td>
</tr>
<tr>
<td>Square</td>
<td>72</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rectangular</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Taller</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Unknown</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Rectangular</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Square</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Number</td>
<td>493</td>
<td>493</td>
<td>493</td>
</tr>
</tbody>
</table>
In most instances, the secondary and primary buildings surveyed have four elevations, north, south, east and west. The enclosure ratio (er) is the relationship between the openings of a building and the solid material space. The openings are the windows and doors and the solid space is the cladding of the wall or finished solid surface of them. The enclosure ratio records the proportion of open space to solid of each of the four walls. Represented examples are 1:4, which means ¼ or twenty-five percent of the building is open space and seventy-five percent is closed, 2:4, which means ½ or fifty percent of the building is open space, and 3:4, which means ¾ or seventy-five percent of the building is open space and twenty-five percent is closed. This er is represented in the form of a ratio but can be translated further into a fraction and a decimal. The design of the Charleston single-house and double-house was purposeful and thought out to respond to the city’s urban density and hot, humid weather. Typical enclosure ratio’s for buildings in hot, humid weather are 3:4, where seventy-five percent of the building has open space and twenty-five percent is closed, wall space. This building layout allows for maximum ventilation. Placement of windows and doors is an intentional way to address the tropical weather and respond to the urban conditions. Large ers show a priority for creating air circulation and cooling down the interior of the building. More openings would be considered for important buildings that needed to provide a thermal comfort to its tenants or for buildings where the use drives a need for ventilation.

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According to Figure 4.2, secondary buildings are built with fewer open spaces, doors, and windows than their primary building. There are fewer primary buildings than secondary buildings with a 1:4 er, the most closed off. The most common secondary building use with a 3:4 er are labeled on the Sanborns as “old” buildings, while majority of secondary buildings with a 2:4 and 1:4 er are commercial buildings. Buildings defined as “old” are not delineated any further, so their exact purpose is unknown. As for primary buildings, residential buildings are frequently found with a 3:4 and 2:4 er and commercial buildings comprise the majority of the 1:4 er. This means there is more enclosure ratio consistency in the primary buildings and more range in the secondary buildings. This contrasts somewhat with today where commercial, particularly retail, prioritizes large openings. Based on the data, both secondary and primary buildings were built with fewer open spaces and buildings with a 2:4 and 3:4 enclosure ratio were predominantly residential, commercial and ecclesiastical buildings (see Appendix A). We learn that enclosure ratio is closely tied to building use and influenced by height, scale and mass.
1884: Spatial Analysis

The final comparative analysis pertains to how the property elements are configured. In 1884, a total of 493 buildings are shown in the survey boundary. Of these, 319 are detached, eighty-seven are attached to the primary building on the lot, seventy-seven are attached with a hyphen, which is distinct from a classification of attached because the primary and secondary building elements are connected with a third building element rather than directly joined, and ten are connected in some other way. Other forms of attached dwellings include buildings connected by a frame partition or attached to the dependency directly or with a hyphen. The majority of outbuildings in 1884 are detached from their primary building at 64.71 percent, while attached and hyphenated outbuildings are only distinct from each other by a 2.03 percent difference. During a time when fires were a constant concern, detached outbuildings were a common form of fire protection. An important form of defense needed after recovering from the 1830’s, a decade of fire, and the great fire of 1861 (see Figure 4.3).34 With such a long history of destruction caused by closely spaced buildings, inferior construction and lax oversight, the use of detached buildings would confine the fire to a single vernacular building which could be quickly extinguished before spreading further.

34 Fires of the 1830’s include: February 16, 1833 (ran from the corner of East Bay to Market); February 15, 1835 (ran from the corner State to Lguard and destroyed St. Philip’s Episcopal Church); June 6, 1835 (ran from the west side of Meeting, between Market and Hasell, and destroyed 182 dwelling houses and stores and 374 outbuildings); October 2 and 3, 1835 (King street); October 26, 1836; March 23, 1837; July 9, 1837; the great fire of 1838 (destroyed nearly 150 acres of the commercial district); April 16, 1839; July 14, 1839; August 7, 1839; September 1, 1839; September 12, 1839 (most of Bedon’s Alley and the frame corner building on Elliot street were destroyed); December 27, 1839. (“The 1830’s: A Decade of Fires,” Preservation Society of Charleston, accessed March 10, 2019, http://halseymap.com/flash/window.asp?HMD=61); The fire on December 11, 1861 began at the intersection of East Bay and Hasell Street and burned over 540 acres, 575 homes, numerous business, and five churches. The cost of property damages was estimated to be between five million dollars and eight million dollars. Major damage to Charleston, during the Civil War, was caused by the Fire of 1861. (“The Great Charleston Fire of 1861,” Lowcountry Walking Tours, last modified February 10, 2014, https://lowcountrywalkingtours.com/2014/02/10/the-great-charleston-fire-of-1861/ )
Accessibility is determined based on the information presented in the Sanborn maps. Access is categorized into six categories: directly from the back street, directly from the main street, from an open space perpendicular to the main road (side entrance), through a partially enclosed access way (such as along a piazza or under a breezeway), inside the primary/main building, or through multiple entrances. The first route discussed is entering a property through a back entrance, which is used .2028 percent of the time. This accessibility type takes someone to the very back of the property where she or he will enter and walk up to the main house past other back buildings. An example of this form of entry is seen below in Figure 4.4 showing 45 Tradd Street. It is uncommon visitors would come through this entrance. The visitor and family residents would be dropped off at a separate entrance and the workers and carriage drivers would use the entrance at the back of the property.
Additional forms of property entry include directly from the street and from an open space perpendicular to the main road (side entrance). Properties located on corner lots can be entered from a side entrance that directly opens up into the yard space. This form of entry is used 6.896 percent of the time. Workers and property owners would typically use this as a main entrance. However, depending on the relations of the visitor, they might also enter directly into this space if they were well connected with the family. In Figure 4.5, 19 Broad Street shows this property style as it sites abutting Gadesden Alley which allows for an entryway on the side for people to enter and exit.
Through a partially enclosed access way (such as along a piazza or under a breezeway) is a form of entry that is used only 6.693 percent of the time within the walled city. In 1884, this form of access was used to reach multiple different buildings or was used to access a single building. One representation of this form of entry is seen at 23 and 25 Queen Street in Figure 4.6 as a breezeway centrally located and attached to both buildings and is used to get to the back of the property behind the main dwellings by residents, property workers or visitor. The second form of a partially enclosed breezeway is located at 507 and 509 Elliot Street (see Figure 4.7). This corridor

Figure 4.5: 1884 Sanborn map, sheet 12 showing 19 Broad Street provided by the Sanborn Map and Publishing Company.
Figure 4.6: 1902 Sanborn map, sheet 60 showing 23 and 25 Queen Street. Provided by the Sanborn Map and Publishing Company.

Figure 4.7: 1884 Sanborn map, sheet 12 showing 507 and 509 Elliot Street, now 22 Elliot and 28 Elliot Street. Provided by the Sanborn Map and Publishing Company.
was used by the residents and workers of the property to enter the space behind the house. It was more formal an entrance than a shared corridor.

A secondary building can only be reached through the primary building if there are no open spaces contiguous to the building or corridors that allow for a person to enter the lot. Entering a property directly through the primary building is the second most common form of accessibility in 1884 at 27.99 percent. The Sanborn in Figure 4.8 shows this form of entry at 89 and 93 East Bay Street. There were no corridors or vacant spaces along the sides of the building and the only way to reach the back of the property was by entering the primary building. Also visible in Figure 4.8 is 95 Broad Street, which used multiple forms of access to enter the building. This occurred when multiple businesses resided in a single building or if the property was mixed use; every entrance had a defined address. For these property types, their entrance was from the main road without interacting with the primary building.
While surveying these properties, if a building has an unknown form of accessibility or if more than one form of entry is visible in the Sanborn maps, the property is labelled as having “multiple entrances.” In 1884, 57.606 percent of the properties had more than one way to enter the property, making it the most common lot arrangement accessibility pattern. 27.99 percent of the properties were entered directly through the primary, 6.693 percent are entered through a property corridor, 6.896 percent are entered through a side entrance directly into the property’s yard and .6085 percent of the properties are entered from the main road or from the back of the property, Appendix A.
Figure 4.9: Secondary buildings use and accessibility surveyed in 1884.

The data suggesting that most properties contain multiple paths for access corroborates research conducted by Bernard Herman. In *Slave and Servant Housing in Charleston* (1999) Herman states, “The standard arrangement of a town-house lot placed the principle dwelling on the street, usually with several possible paths of access.” With entrances leading directly from the street, a second entrance leading into the piazza and directly in to the main dwelling and yard, and further entrances from the side and back of the properties, it is impossible to definitively say which entrance was being used to enter the property and reach the outbuildings. However, the data shows commercial use buildings more commonly use multiple entrances to enter the property (see Figure 4.9). Most of the buildings that use multiple access points include: commercial, civic, ecclesiastical, kitchen, mixed-use, residential, stables, tenements. All these buildings have different levels of interaction with the public (workers, visitors, residents) and a different entrance if used for each interaction.
**1902: Architectural Analysis**

A total of 455 buildings were surveyed on the 1902 Fire Insurance Map. In 1902, there are thirty-eight fewer buildings surveyed than in 1884. This is because property buildings were demolished between these two survey years, decreasing the number of outbuildings present within the walled city. In addition to a smaller number of buildings, the number of different types of use reduced from 1884 to 1902, as can be seen in Appendix B. The reduction in use types has much to do with the map making process. The Sanborn maps begin labelling building use into more general terms, with less specificity. The maps cease to point out the race and income levels of the people associated with each building as directly. For example, in 1884 two buildings were recorded as “Negro” and “Old & Rotten” residence and in 1902 these classifications change to “Servants” quarters, which is more generic, though still carries an indication of social class.

**1884 & 1902 COMPARATIVE BUILDING USE**

<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial</th>
<th>Residential</th>
<th>Kitchens</th>
<th>Separate Dwelling</th>
<th>Stables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>106</td>
<td>69</td>
<td>22</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>1902</td>
<td>80</td>
<td>75</td>
<td>0</td>
<td>80</td>
<td>33</td>
</tr>
</tbody>
</table>

*Figure 4.10: Comparative data of building use during 1884 and 1902.*

Similarly to the 1884 map, the 1902 Sanborn has a majority of residential and commercial use buildings: eighty commercial outbuildings and seventy-five residential outbuildings. There is a
significant decrease in commercial, residential, and kitchen houses from 1884 to 1902 because of the overall number of buildings decreases and “separate dwelling” appears for the first time in 1902, comprising 17.58 percent of the back buildings (see Figure 4.10). These buildings are labeled as “separate dwellings,” whether that means separate families reside on the property or a separate dwelling is a dependency is indistinct. There is also a change in the use of stables within the walled city. In 1884 there were thirty stables within the walled city and in 1902 there is a total of thirty-three. In addition to an increase in number, the community stable becomes more popular. Rather than property owners using private stables on their property, the city builds larger public buildings for community equine boarding space.

Along with shift in connection and location, materials found within the walled city change from 1884 to 1902, Table 4.5. Brick buildings are still more common in the city, constituting 53.41 percent of the secondary buildings and 79.73 percent of the primary buildings relative to 64.71 percent of the secondary buildings and 83.44 percent of the primary buildings in 1884. This percentage decrease between 1884 and 1902 is because fewer buildings were present within the historic walled city and more building materials are used in 1902 than in 1884. Frame follows behind as the second most material used in 1902, comprising 38.46 percent of the secondary buildings an increase from 26.57 percent in 1884. This could be because wood is a cheaper material and took less construction time. There is also a decrease in the identification of “specials”, with only .084 percent of the buildings considered “specials” in 1902 contrasted to 3.7 percent in 1884. In 1902 steel is introduced as a material noted in the Sanborn maps and is used to construct one accessory civic building at 114 Meeting Street. The use of steel as a main material shows architects are experimenting with the building culture and attempting to advance technologically.
Table 4.5: Secondary and primary buildings materials found within the walled city in 1902.

Secondary Materials

<table>
<thead>
<tr>
<th>Primary Materials</th>
<th>Brick &amp; frame</th>
<th>Brick &amp; iron clad</th>
<th>Brick</th>
<th>Frame</th>
<th>Frame special</th>
<th>Steel</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>brick</td>
<td>27</td>
<td>2</td>
<td>217</td>
<td>112</td>
<td>1</td>
<td>1</td>
<td>360</td>
</tr>
<tr>
<td>brick and frame</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>brick special</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>frame</td>
<td>3</td>
<td>1</td>
<td>21</td>
<td>59</td>
<td></td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>frame iron clad</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Number</td>
<td>32</td>
<td>4</td>
<td>243</td>
<td>174</td>
<td>1</td>
<td>1</td>
<td>455</td>
</tr>
</tbody>
</table>

Height, scale and mass patterns between front and back buildings stay consistent from 1884 to 1902, as seen in Table 4.6. Secondary buildings continue to be rectangular and square in massing, smaller than their primary buildings and shorter. The only outlier to these findings is a single building that is smaller in massing but taller than its primary. This taller building is the aforementioned civic building that experiments with steel as its primary building material at 114 Meeting Street. The property is evidence that architects were not only expanding on construction techniques but where also playing with the height, scale and mass of outbuildings. The fact that there is only one instance of this steel building reinforces the rule that in 1902, as with in 1884, outbuildings are smaller, shorter and have less complex massing than primary buildings.
Table 4.6: HSM of secondary buildings on the Charleston, SC 1902 Sanborn Maps.

<table>
<thead>
<tr>
<th>Height, Scale, Mass of Secondary to Primary Buildings</th>
<th>Height</th>
<th>Scale</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bulkier</strong></td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Polygon massing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same height</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Shorter</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Taller</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same height</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Shorter</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Taller</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Approximately same size</strong></td>
<td>32</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Same height</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Shorter</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Same height</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Shorter</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td><strong>Square</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Same height</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Shorter</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Smaller</strong></td>
<td>242</td>
<td>242</td>
<td>242</td>
</tr>
<tr>
<td>Polygon massing</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Same height</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Shorter</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>170</td>
<td>170</td>
<td>170</td>
</tr>
<tr>
<td>Same height</td>
<td>37</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Shorter</td>
<td>133</td>
<td>133</td>
<td>133</td>
</tr>
<tr>
<td><strong>Square</strong></td>
<td>57</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>Same height</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Shorter</td>
<td>42</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Taller</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Number</strong></td>
<td>291</td>
<td>291</td>
<td>291</td>
</tr>
</tbody>
</table>

In 1902, back buildings continue to have a higher 1:4 enclosure ratio (er): 65.72 percent of secondary buildings have the smallest number of openings noted in the survey. Primary buildings are more commonly constructed with a 2:4 enclosure ratio, increasing from 33.1 percent in 1844 to 53.6 percent in 1902. This could be because building technology advancement led to structural experimentation which included more open, interior space, more windows, and more doors. Like
height, scale and mass the enclosure ratio keeps the same descending pattern (see Figure 4.11). Unlike 1884, there is a comparable number of secondary and primary buildings with a 3:4 enclosure ratio.

1902 ENCLOSURE RATIO (ER)

![Graph showing enclosure ratios of primary and secondary buildings found within the walled city in 1902.](image)

*Figure 4.11: Enclosure ratios of primary and secondary buildings found within the walled city in 1902.*

1902: Spatial Analysis

The data collected from the 1902 Sanborn maps that analyze back building connection and location show similar findings to the 1884 data. Charleston’s typical linear property layout influences the majority of building placement and connection, as seen in 1884. The planning and organization of Charleston in 1902 compared to 1884 leads to the demolition of buildings and an increase in the number of attached and hyphenated buildings, which creates a less dense and more organized urban environment.

The year 1902 shows change in building connection for the major building use types: commercial, residential, kitchens, and separate dwellings. For commercial back buildings, there
were forty-nine attached buildings, twenty-one hyphenated back buildings and six detached outbuildings; for residential back buildings, there were forty-five attached buildings, twenty-eight hyphenated back buildings and one detached outbuilding; there was only one detached kitchen house in 1902; for separate dwellings, there were five attached buildings, five hyphenated back buildings and sixty-eight detached outbuildings (see Table 4.7). Property owners attach and hyphenate more residential units to their primary buildings and build more separate dwellings in the back yard of the lot than seen in 1884. For example, an attached residential back building is constructed at 12 Water Street and a detached “separate dwelling” appears at 10 St. Michael’s Alley, two buildings that were not present in 1884. Individually tracing each of these buildings would help determine the evolution of connection. Because there are instances of multiple back buildings for one main building and without the use of visual assessment, individual building evolution cannot be traced using this data.

The use of a separate kitchen houses declines from 1884 to 1902. Historically, kitchens were built separately or hyphenated to the main dwelling to prevent the spread of fire from kitchen activities to the main living space. These separate kitchens are often organized in a linear fashion, meaning they align with the main building and are behind it from a street view. Fires were a big issue in Charleston because of the primary use of wood, the high-density level of the urban city and cooking and heating methods that used open flame. However, rather than having detached and hyphenated kitchens for residential and other uses in 1902, these buildings are replaced with additions to the main dwelling and separate dwellings. Like many cities, with the passage of time and advances in cooking and heating, including the use of coal and gas, property element patterns change. Because of the city’s use of fire-resistant materials, the new sparsity of the urban complex is seen in decreased number of buildings. While the number of buildings decreases, the
connections between the main building and back building show the same trends: typically
detached, linearly organized on the property, and accessed from multiple forms of entry.

Table 4.7: Number of attached, hyphenated, and detached secondary commercial, residential, kitchen houses and separate dwellings in 1884 and 1902.

<table>
<thead>
<tr>
<th>Connection</th>
<th>Commercial</th>
<th>Residential</th>
<th>Kitchen</th>
<th>Separate Dwelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884 Attached</td>
<td>47</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1884 Hyphenated</td>
<td>29</td>
<td>19</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>1884 Detached</td>
<td>25</td>
<td>27</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>1902 Attached</td>
<td>49</td>
<td>45</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1902 Hyphenated</td>
<td>21</td>
<td>28</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1902 Detached</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>68</td>
</tr>
</tbody>
</table>

In 1884, 57.62 percent of the properties surveyed used multiple entrances to enter the property and in 1902, 58.46 percent of the properties surveyed used multiple entrances. Multiple entrances continue to be the main source of accessibility for properties in 1902 followed by entering a property directly through the primary building. These multiple access points are a recurring theme within the walled city. A subsequent path of entry, entering a property through the primary building, is seen 23.73 percent of the time in 1902, in contrast with 27.99 percent in 1884. This form of entry is more prevalent in the areas with higher density and smaller lot size space. The houses found in these areas are built contiguous to each other and often share walls with the neighboring properties. Evidence of this can be seen in Figure 4.12 at 45 and 47 Broad Street.
1955: Architectural Analysis

A total of 465 buildings are surveyed on the 1955 Fire Insurance maps, twenty-eight fewer buildings than are surveyed in 1884 and ten more than are surveyed in 1902. This is because more buildings were constructed between 1902 and 1955, though 1884 had the highest number of buildings constructed within the walled city. Material development is also visible between the 1884, 1902 and 1955 maps. A multitude of new building materials are being used to construct secondary and primary buildings within the walled city, some of which include adobe, asbestos clad, hollow concrete or cement block, and concrete, lime, cinder or cement brick (see Figure 4.13). The most common building materials used continue to be brick, 52.9 percent, and wood, 10.75 percent, but concrete is used to construct 2.15 percent of the outbuildings in 1955, the third most
common material used. Primary buildings maintain relatively little variation in building material, which including brick, concrete, frame and iron. The differentiation of “special” buildings is no longer present in the 1955 Sanborn maps, presumably because “special” is no longer used as an economic indicator.

Back buildings also become less visible from the public right-of-way, 82.37 percent of the back buildings in 1955 are located directly behind the primary buildings. The increase in hiddenness has also increased experimentation of back buildings. As long as these buildings are not seen from the street, property owners have more freedom when completing alterations to the exterior of the building. 35 We see this in the data because of the 294 buildings located behind the primary, 7.47 percent of material use which is higher than the use of that material in the four buildings seen from the public right or way.

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Enclosure ratios, height, scale and mass of outbuildings have the same general patterns as the previously surveyed years, 1884 and 1902. Every building continues to have rectangular and square massings and majority of the outbuildings are smaller in scale. Heights of outbuildings correspond with scale; 80.59 of the smaller outbuildings are shorter, 62.06 percent of the outbuildings that are approximately the same size are the same height, and 71.43 percent of the bulkier buildings are taller (see Table 4.8).

Showing parallels to the previous two years studied, the enclosure ratios of the buildings in 1955 show secondary buildings as having a larger frequency of 1:4 er. Primary buildings comprising the highest number of buildings with a 3:4 er, Figure 4.14. Dissimilar to the previous years where there is a large difference in the number of secondary and primary buildings with a 1:4 er, there are only six fewer primary buildings with a 1:4 ratio. Compared to 1884 which had a
22.11 percent difference and 1902 which presented a 28.35 percent difference between the primary and secondary building ratios. The buildings surveyed in 1955 have the smallest percentage difference, at 1.29 percent, between primary and secondaries with a 1:4 er.

![1955 ENCLOSURE RATIO](image)

*Figure 4.14: Enclosure ratios of primary and secondary buildings found within the walled city in 1955.*
The 1955 maps illustrate a new building type being recorded, the public and private garage.

The “Auto House or Private Garage” comprise 21.5 percent of the secondary buildings in 1955, only 2.37 percent less than commercial buildings, which is the leading form of building use since 1884.

### Table 4.8: HSM of secondary buildings on the Charleston, SC 1955 Sanborn Maps.

<table>
<thead>
<tr>
<th>Height, Scale, Mass of Secondary to Primary Buildings</th>
<th>Height</th>
<th>Scale</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Unknown</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Bulkier</strong></td>
<td>28</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td><strong>Same height</strong></td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td><strong>Polygon massing</strong></td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>Square</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Shorter</strong></td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td><strong>Polygon massing</strong></td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Taller</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Approximately same size</strong></td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td><strong>Same height</strong></td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td><strong>Polygon massing</strong></td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td><strong>Square</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Shorter</strong></td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td><strong>Polygon massing</strong></td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td><strong>Smaller</strong></td>
<td>407</td>
<td>407</td>
<td>407</td>
</tr>
<tr>
<td><strong>Same height</strong></td>
<td>70</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td><strong>Polygon massing</strong></td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>37</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td><strong>Square</strong></td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td><strong>Shorter</strong></td>
<td>328</td>
<td>328</td>
<td>328</td>
</tr>
<tr>
<td><strong>Polygon massing</strong></td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>195</td>
<td>195</td>
<td>195</td>
</tr>
<tr>
<td><strong>Square</strong></td>
<td>98</td>
<td>98</td>
<td>98</td>
</tr>
<tr>
<td><strong>Taller</strong></td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Square</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Unknown</strong></td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Rectangular</strong></td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Square</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Number</strong></td>
<td>465</td>
<td>465</td>
<td>465</td>
</tr>
</tbody>
</table>
The presence of the garage is linked to the increase in the use of the automobile after the industrial revolution and the ability to mass produce vehicles, which all but eliminated the need for stables to house horses and carriages (see Table 4.9). Not only are building types disappearing to be replaced with new innovations, more mixed-use buildings are recorded on the peninsula.

Table 4.9: Number of stables and garages present in 1884, 1902 and 1955.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Stables</th>
<th>Number of Garages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>1902</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>1955</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

Mixed-use buildings are a live-work space as an urban-development strategy. Incorporating businesses and living quarters in the same building becomes a more predominant building type, or more frequently recorded in the 1955 Sanborn map. Peter Coclanis stated in his article *The Sociology of Architecture in Colonial Charleston*, “Though some [buildings] were used for dwelling purposes only, most served dual functions, that of workplace as well as residence.”

According to Sanborns this is true only after 1955. This could reflect either changed patterns of use or changing standards of how to record use when creating Sanborn maps. Shops dominate the first floors and residential space is located on all the upper floors. The number of recorded mixed used buildings spikes from 1.83 percent in 1884 to 14.4 percent in 1955. However, there are no records of buildings in 1902 that are used for mixed-use, showing Charleston architectural ideals and how a building should be used changes to correlate more with the 1884 peninsula. Also worth noting,

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from 1884 on, the area that is mainly residential now used to be quite commercial and diverse in function, as seen below in Figure 4.15 and Figure 4.16.

*Figure 4.15: 1884 Sanborn Map sheet 13 showing commercial and industrial area of 1305, 1306, 1307 Church Street. Provided by the Sanborn Map and Publishing Company.*
1955: Spatial Analysis

While there are some characteristics of nineteenth-century Charleston’s urban city that appear in 1955, organization of lot space evolves in a completely different direction. The dense area of the walled city in 1884 is packed with buildings which are placed based on availability of lot space rather than with purposeful arrangement. As the city evolves and fire destruction ensues, expansion occurs, health laws are implemented, and property owners reorganize their built space. This reorganization of space includes “quarters, kitchens, and washhouses.”37 Middle class areas

continue to subdivide and density increases, however the data suggests the removal and reuse of unused and vacated buildings lead to property element rearrangement, open space and order.

In 1884 buildings including barns, shed, junk, old, shanty, stables, and kitchens are no longer recorded on the 1955 Sanborn map. Perhaps, these building types are no longer needed in the industrial context. These buildings are reused, replaced or demolished, creating more property space. This open space also allows for variety in the placement of the new and repurposed buildings, but the forms of property entry remain the same (see Figure 4.17). Using multiple points of entry to access a property continues to be the main form of access at 51.6 percent followed by entering directly through the primary dwelling at 27.5 percent. The largest change in property accessibility is the number of properties that use a side entrance as the main access point. The amount of properties surveyed with a side entrance leading directly into the yard space doubles from 3.29 percent in 1902 to 6.67 percent in 1955. This percentage increase could occur because: buildings were demolished and redesigned with side entrances leading into a public yard or garden space or corner lot space was reorganized allowing for new side entrances. The main buildings that comprise this access path are garages, commercial buildings and separate dwellings, a total of 45.5 percent. All of which are buildings that need a separate entry point from their primary building to serve their function.
The 1955 Location and Accessibility figure, Figure 4.17, shows the six forms of accessibility have not changed between 1884 and 1955. The possible locations back building can be located has increases, but someone is only meant to enter a property from a back entrance, through a side entrance directly into the back yard, through a property breezeway, through the primary building, from multiple entrances or from the main road. This reveals even as property layout evolves and new ideas are being implemented on where buildings are constructed, accessibility remains the same from 1884 onward. Data collected in the survey takes a deeper look into the evolution of the individual outbuilding, spatial arrangement of the multiple property elements and comparative study between primary and secondary buildings found within the walled city. The tables and graphics will lead to further analysis and conclusions using ArcMap in ArcGIS.
Chapter 5: Analysis

The raw data collected from the nine architectural and three spatial relationship questions provides information about how buildings are architecturally related on each property, how buildings are related in form, how buildings are placed in relationship to each other, and how buildings are accessed from the public right-of-way in order to understand how Charleston’s outbuildings have evolved. Outbuilding evolution has shown consistency and experimentation from the years 1884 to 1955. This thesis shows a consistency in predominantly brick and wood frame materials used, outbuildings are smaller and shorter buildings relate to their main building, and outbuildings consistently have fewer openings than the main building within the walled city. Specifically, outbuildings were built behind the big houses as smaller, shorter and rectangular or square massings. The buildings were also designed with fewer open spaces, doors and windows, then most primary buildings which infers less thought was given to the comfort of the occupants and workers. It is not until the industrial revolution and technological exploration that we see outbuilding construction, use and building placement begin to change.

From 1884 to 1955 outbuildings show consistently large numbers of uses. As the years progress, ancillary building use changes because of technological advancement. Stables and sheds are no longer a necessity and are replaced by garages, mixed-use buildings and separate dwellings. Additionally, there is a change how buildings are described by Sanborn maps from 1884 to 1955. More generalized terms are used in the twentieth-century, unlike in the nineteenth-century where building labels were used to signify economic class and race.

Building connection patterns and accessibility data within this study show consistency over time as with building construction material and form. Outbuildings are consistently built detached,
but from 1884 to 1955 there is an increase in the number of hyphenated and attached accessory buildings. The most common way to reach these attached, detached and hyphenated buildings is from multiple entrances. Because properties in Charleston have always been used for multiple purposes by various individuals, different entrances were offered for people visiting and working on a property. Materials, building form, use, placement and accessibility will be discussed further in the following sections.

**Building Materials**

Surveying the main building material of the primary and secondary buildings is essential in understanding if there was an aesthetic relationship between property elements. Specifically, if material similarity was considered during design and construction development within the walled city. This thesis shows that wood and brick have historically been the major construction materials within the walled city. Aside from small instances of experimentation with metal and other forms of masonry, frame and brick were the materials of choice until 1955 when concrete became a popular material.

The consistent use of wood and brick building materials within the walled city is due to their durability, availability and Charleston builders’ knowledge and understanding of them. Between 1884 and 1902, there was no reason to experiment with other materials when brick and wood worked so effectively. A change of materials is seen in 1955 when metals and concrete were more often being used. Materials other than wood and brick appeared because building technology was advancing, quality wood was becoming more difficult to find and brick and wood were more expensive materials. Unlike building with brick and wood, concrete also took less experience to construct and install. This allowed developers to hire less qualified workers at a cheaper rate.
With frame and brick buildings being the main construction form before 1955, little variation is present in 1884 other than two stone buildings, 18 State Street and 809 Church Street (now 148 Church Street), the only two buildings within the walled city other than brick or frame. The outbuilding at 18 State Street was used as junk storage and the outbuilding that once stood at 148 Church Street was used commercially as a paint shop. Both of these buildings were demolished by the time the Sanborn Company published the 1902 Fire Insurance Maps. The property at 18 State demolished the junk storage building and replaced it with a single-family residence with one frame back building and the building at 148 Church Street was replaced by a single-family residence without any back buildings.

Of the 302 primary buildings surveyed in 1884, 252 were brick, forty-nine were frame and one was brick and frame construction. Of the 493 secondary buildings in 1884, 319 were brick, 131 were frame, forty-one were brick and frame and two were constructed with stone. Of the forty-nine wood main buildings, there were forty-three frame outbuildings and twenty-eight masonry outbuildings and six had a combination of materials. Additionally, of the 252 brick primary buildings, there were 292 brick outbuildings, eighty-six frame outbuildings and thirty-five had a combination of materials (see Table 5.1). The data shows outbuildings were constructed more with brick followed by frame. The data also shows outbuildings more commonly had the same materials as the primary building on the property. If the main building was frame construction, 87.76 percent of the outbuildings on that site would also be frame construction. If a back building was brick construction, 86.30 percent of the main buildings on that site would be brick construction.
Table 5.1: Primary and secondary buildings surveyed within the walled city in 1884.

<table>
<thead>
<tr>
<th>Overall 1884 Materials</th>
<th>Primary Buildings</th>
<th>Outbuildings</th>
<th>Number of Matching Materials</th>
<th>Percentage of Matching Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brick</td>
<td>252</td>
<td>319</td>
<td>292</td>
<td>86.30%</td>
</tr>
<tr>
<td>Frame</td>
<td>49</td>
<td>131</td>
<td>43</td>
<td>87.76%</td>
</tr>
<tr>
<td>Combination of Materials</td>
<td>1</td>
<td>41</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Stone</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Eighteen years after the first reference in 1884, metal as a building material is present with greater frequency. Developers, engineers and architects were experimenting and using stronger materials to create bigger and grander buildings. This material testing was more prominent in outbuildings. Specifically, four brick and iron clad secondary buildings existed in 1902 and two frame and iron clad primary building is seen on the Sanborn. The brick and iron clad secondary buildings resided at 152 Church Street (unknown use), 189 East Bay Street (commercial use), 191 East Bay Street (commercial use) and 5 Broad Street (commercial use). The frame and iron clad primary building was located at 149/147 Church Street and 151 Church Street and was the front building to one brick and frame back building and has been demolished. These metal cladding systems found on secondary and primary buildings were created with castings and were a cheaper alternative to ornamental stone. Metal cladding was also used to enhance the fireproof system of an otherwise vulnerable building system. The use of the iron clad exterior offered fireproof protection and a cheaper way to decorate these commercial secondary buildings. Using cheaper materials gives priority to the primary buildings; more expensive materials and intricate design

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work can be used on the front building while the back buildings are constructed with cheaper materials but with similar design details as the primary, as seen at these three properties.

Along with iron being used as cladding, steel and wrought iron were used to build a detached secondary civic building at 114 Meeting Street as a fire bell tower behind the Fire Department Headquarters for the city. Metal frame construction was at one time the dominant building material throughout America but it is not common in Charleston, especially in the early years. The emergence of metal at such an early date in Charleston shows the peninsula’s push for more innovative building technologies.

The initial transition period from masonry and iron façade detail to steel frame construction was 1870 to 1905. Steel is a representation of a change in centuries old building ideals: the change from bearing walls and vaulted floors to independent framing, the transition of iron to adaptable steel, and the change of theory from masonry-based compression to flexure-based designs.39

The presence of metal construction at 114 Meeting Street in 1902 shows an incredibly modern initiative, a change in physical construction and a change in building concepts. Charleston is at the fore-front of the modern building age and is entrusting the city’s civic resources in an experimental construction. This civic fire tower is still standing to this day.

Of the 291 primary buildings surveyed in 1902, 238 were brick, fifty were wood and three were made with a combination of materials. Of the 455 secondary buildings in 1902, 243 were brick, 175 were wood, thirty-six were a combination of materials and one was constructed with steel (see Table 5.2). Of the fifty wood main buildings, there were fifty-nine frame outbuildings, twenty-one masonry outbuildings and four outbuildings built with a combination of materials. Of the 238 brick main buildings, there were 222 brick outbuildings, 113 frame outbuildings, twenty-

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39 Donald Friedman, Historical Building Construction (New York: Norton, 2010), 50.
nine outbuildings made with a combination of materials and one outbuilding made with steel frame construction. This shows the majority of outbuildings use the same construction material as the primary building in 1902. If the back building was built as frame construction, 84.74 percent of the outbuildings would also be frame construction and if a main building was brick construction, 93.27 percent of the outbuildings would also be brick.

Table 5.2: Primary and secondary buildings surveyed within the walled city in 1902.

<table>
<thead>
<tr>
<th>Overall 1902 Materials</th>
<th>Primary Buildings</th>
<th>Outbuildings</th>
<th>Number of Matching Materials</th>
<th>Percentage of Matching Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brick</td>
<td>238</td>
<td>243</td>
<td>222</td>
<td>93.27%</td>
</tr>
<tr>
<td>Frame</td>
<td>50</td>
<td>175</td>
<td>59</td>
<td>84.74%</td>
</tr>
<tr>
<td>Combination of Materials</td>
<td>3</td>
<td>36</td>
<td>1</td>
<td>.333%</td>
</tr>
<tr>
<td>Steel</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Building materials used on primary and secondary buildings in 1955 show a dramatic increase in variety and an advanced building material culture (see Table 5.3). Brick and frame continue to be the most common building material used but concrete emerges as the third most frequent construction material. Though records cannot definitively say when the first reinforced concrete building appeared,

Concrete and comparable alternatives were being created during the development of the steel frame system. Earliest versions of concrete were similar to its masonry predecessors and steel contemporaries but soon flourished for its compressive strength, fire retardance, resistance to water, cheap price, and capability to explore more complex forms.40

Because of these diverse abilities, engineers were implementing this new material on public and private buildings in a variety of ways in 1955: hollowed out, as interior walls, reinforced, as cement blocks, mixed with bricks (see Appendix C). This material was so popular it was used more often than masonry and metals, two materials that have a stronger historic precedence. Even with this fame, builders were still experimenting with uncommon materials, including one adobe building and one asbestos-clad building.

Table 5.3: Primary and secondary buildings surveyed within the walled city in 1955.

<table>
<thead>
<tr>
<th>Overall 1955 Materials</th>
<th>Primary Buildings</th>
<th>Outbuildings</th>
<th>Number of Matching Materials</th>
<th>Percentage of Matching Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brick</td>
<td>242</td>
<td>246</td>
<td>237</td>
<td>97.93%</td>
</tr>
<tr>
<td>Frame</td>
<td>9</td>
<td>50</td>
<td>11</td>
<td>81.81%</td>
</tr>
<tr>
<td>Combined Materials</td>
<td>1</td>
<td>45</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Concrete</td>
<td>3</td>
<td>10</td>
<td>2</td>
<td>66.66%</td>
</tr>
<tr>
<td>Iron</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Steel</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Stone</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

In 1955, outbuildings were more than fifty percent likelier to use the same building material as their primary. In 1884, sixty-eight percent of secondary and primary building have matching materials. In 1902, secondary and primary buildings were constructed with the same material 62.42 percent of the time. Finally, in 1955 primary and secondary building matching declined, falling to 54.41 percent. This sustained drop correlates with the growth in outbuilding material diversity. The more materials available makes it unlikely new construction and restored buildings would be built using old and outdated construction practices. This includes building
materials which were expensive and susceptible to fire. Material variety leads to innovative and diverse buildings and a decrease in material symmetry between property elements. Along with building materials having consistency, the height, scale, mass and enclosure ratio of outbuildings show little change between 1884 and 1902.

**Height, Scale, Mass & Enclosure Ratio**

The height, scale and mass of Charleston architecture was influenced by economic prosperity, stylistic preferences, lot space availability and the geo-technical capacity of soils and subsoils. These conditions that once designated what and how things would be built are now the backbone of Charleston’s architectural character. For these reasons, determining how secondary and primary buildings height, scale and mass relate is essential in understanding outbuilding evolution within the walled city and recognizing historically accurate or appropriate patterns moving forward. This thesis shows that outbuildings were typically located behind the primary building, smaller in size, shorter in height and predominantly constructed as a square or rectangular massing.

According to the data collected from all three year, outbuildings within the walled city are only built with rectangular or square massings. There is little variation in building form and massing. Of the 493 outbuildings in 1884, 347 are rectangular, 106 are square and thirty-nine have multiple polygon massings. Additionally, of the 493 outbuildings in 1884, 388 are smaller than the primary; of the 455 outbuildings in 1902, 394 are smaller than the primary; of the 465 outbuildings in 1955, 407 are smaller than the primary. Though there is a dominant majority of outbuildings that are smaller than the primary building overtime, this dominance increases with time (see Table 5.4). This means that smaller outbuilding footprints became the norm within the walled city as time
went on. The data also suggests that heights of the outbuildings within the walled city correlate with scale (see *Table 5.5*). Outbuildings that are shorter than the primary building make-up 69.57 percent of the outbuildings in 1884. Outbuildings that are approximately the same height as the primary are 21.29 percent of the buildings in 1884. Outbuildings taller than the primary building are 2.43 percent. The heights of 6.69 percent of outbuildings in 1884 are unknown.

*Table 5.4: Percentage of smaller outbuildings surveyed in 1884, 1902 and 1955.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage of Smaller Outbuildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>78.70 %</td>
</tr>
<tr>
<td>1902</td>
<td>86.6%</td>
</tr>
<tr>
<td>1955</td>
<td>87.52%</td>
</tr>
</tbody>
</table>

Moving into 1902 and 1955, outbuildings continue to be primarily shorter than the main property building. In 1902, outbuildings that are shorter than the primary building are 74.29 percent, outbuildings that are approximately the same height as the primary building are 24.39 percent and outbuildings that are taller than the primary buildings are 1.32 percent. In 1955, the outbuildings that are shorter than the primary building are 74.62 percent, outbuildings that are approximately the same height as the primary building are 22.8 percent, and outbuildings that are taller than the primary building are 1.08 percent and the height of 1.50 percent of the outbuildings in 1955 are unknown. This shows that outbuilding form continued to get smaller and shorter within the walled city between 1884 and 1955.
### Table 5.5: Percentages of shorter outbuildings surveyed in 1884, 1902 and 1955.

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage of Shorter Outbuildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>69.57%</td>
</tr>
<tr>
<td>1902</td>
<td>74.29%</td>
</tr>
<tr>
<td>1955</td>
<td>74.62%</td>
</tr>
</tbody>
</table>

As Charleston’s population grew, urban density was affected. This decreased lot space in the downtown area, which forced developers to build smaller and deliberately. Additionally, outbuildings were historically viewed as purpose-built buildings meant for the servants to sleep and work. The data showing that most of the properties are smaller and shorter with simple massing supports the concept of these utilitarian buildings. Buildings built for this purpose would rarely be larger or obtain grandiose details when prominent figures would not use these buildings to host guests. Along with this smaller and shorter standardized building form, outbuilding enclosure ratio shows strong regularity over time.

For each year surveyed, secondary buildings enclosure ratio moves in descending order, meaning that outbuildings continue to have fewer openings. In 1884, of the 493 outbuildings surveyed, 324 had a 1:4 enclosure ratio and fewer openings, 132 outbuildings had a 2:4 enclosure ratio and 37 outbuildings had a 3:4 enclosure ratio and more open spaces. Of the outbuildings surveyed in 1902, 271 outbuildings had a 1:4 enclosure ratio and fewer openings, 108 outbuildings had a 2:4 enclosure ratio and 76 outbuildings had a 3:4 enclosure ratio and more open spaces. Lastly, of the outbuildings surveyed in 1955, 226 outbuildings had a 1:4 enclosure ratio and fewer openings, 200 outbuildings had a 2:4 enclosure ratio and 39 had a 3:4 enclosure ratio and more open spaces (see Table 5.6).
Table 5.6: Percentages of secondary building enclosure ratios found within the walled city in 1884, 1902 and 1955.

<table>
<thead>
<tr>
<th>Year</th>
<th>1:4</th>
<th>2:4</th>
<th>3:4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>65.72%</td>
<td>26.77%</td>
<td>7.51%</td>
</tr>
<tr>
<td>1902</td>
<td>59.56%</td>
<td>23.74%</td>
<td>16.70%</td>
</tr>
<tr>
<td>1955</td>
<td>48.60%</td>
<td>43.01%</td>
<td>8.39%</td>
</tr>
</tbody>
</table>

In 1884 and 1902 there are more primary buildings with a 2:4 and 3:4 enclosure ratio than outbuildings, showing the primary buildings have more open or glazed surface area which correlates with being more comfort driven design. In 1955, there were more secondary buildings with a 2:4 enclosure ratio than primary buildings. This outlier is present because 21.5 percent of the outbuildings surveyed in 1955 were detached public or private garages, which retains an enclosure ratio of 2:4. These garages featured large windows and doors for automobiles to move through and was a popular enough commodity to affect the enclosure ratio data.

The enclosure ratio data collected from each year shows that smaller secondary buildings more commonly have the same enclosure ratio of the main building than bulkier back buildings or back buildings that are approximately the same size as the main building (see Table 5.7). Additionally between 1884 and 1955, the chances of the enclosure ratio of a smaller back building and the enclosure ratio of the main building being the same increases, except in 1955 where matching 2:4 and 3:4 enclosure ratio’s slightly decreases by two percent. This shows if a property’s back building was smaller it would most likely have a similar number of openings to its main building.
Table 5.7: Percentages of matching enclosure ratios between smaller back building and main buildings in 1884, 1902 and 1955.

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage of Matching 1:4 Enclosure Ratio</th>
<th>Percentage of Matching 2:4 Enclosure Ratio</th>
<th>Percentage of Matching 3:4 Enclosure Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>84.89%</td>
<td>68.42%</td>
<td>70%</td>
</tr>
<tr>
<td>1902</td>
<td>88.76%</td>
<td>86.54%</td>
<td>75%</td>
</tr>
<tr>
<td>1955</td>
<td>92.19%</td>
<td>84.29%</td>
<td>68.75%</td>
</tr>
</tbody>
</table>

The 1884, 1902 and 1955 data shows secondary buildings were constructed more frequently with a 1:4 ratio than the primary buildings within the walled city. Thus, secondary buildings were thought of less when it came to comfort. However, the data also shows if a secondary building was smaller in form the chances of the enclosure ratio matching the primary building was higher. This suggests that both building use and the primary building’s enclosure ratio influenced the outbuilding enclosure ratio.

**Building Use**

The secondary buildings were where domestic work was completed so the property continued to run smoothly and successfully. The buildings were also used as living quarters at many socioeconomic levels. According to the data collected from 1884 to 1955, the variety of building use was at similar levels over time but changed in specificity. In the 1902 and 1955 Sanborns the number of building use descriptions slowly decreased then rose back up to twenty (see Figure 5.8). However, building use does change drastically based on residential needs and industrialism.
Table 5.8: Number of building use types surveyed in 1884, 1902 and 1955.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Building Use Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>20</td>
</tr>
<tr>
<td>1902</td>
<td>16</td>
</tr>
<tr>
<td>1955</td>
<td>20</td>
</tr>
</tbody>
</table>

The twenty building types present in 1884 include: “negro residence,” “old and rotten negro residence,” barn, beer storage, bowling alley, civic, commercial, confederate windows home, ecclesiastical, hot house, junk, kitchen, mixed-use, old, residential, shanty, shed, stable, tenement and unknown. The sixteen building types present in 1902 include: confederate home and school, junk, kitchen, power house, ruins, separate dwelling, servants, shed, stable, tenement, unknown, vault, civic, commercial, ecclesiastical and residential. Lastly, the twenty building types present in 1955 include: air conditioning unit, auditorium, auto service, private and public auto garage, civic, commercial, theatre, ecclesiastical, green house, mixed-use, oil storage, open elevator, plastered, residential, ruins, separate dwelling, storage, studio, unknown and warehouse.

Secondary buildings were frequently purpose built to provide location for a given use or activity. Some were flexible enough to be updated to other uses. As the city prospered, many buildings became vacant because they were no longer economically applicable to the city’s residents. For example, in 1884 multiple buildings were surveyed as “shanty,” “old,” “hot house,” bowling alley, beer storage, barn, “negro residence” and “old and rotten negro” residence that are not present on the 1902 or 1955 Sanborn maps. These buildings were relevant at the time and used as living quarters, storage, and recreational purposes, but as the years progressed the buildings were repurposed or demolished for redevelopment. Similarly, a very common building use, the stable, seen frequently on the 1884 and 1902 Sanborns, is not on the 1955 map. Taking
its place, the auto garage, replaced these stables and were even seen replacing other secondary shed buildings. In 1884, 6.09 percent of outbuildings were stables; 7.23 percent of outbuildings were stables in 1902. Public and private garages compiled 21.51 percent of secondary buildings on the peninsula in 1955, slightly less than a quarter of Charleston’s outbuildings. Outbuildings mark the changing technologies of the property residence, first to house horses and carriages and then to house vehicles.

Another notable fact is the increase of separate dwellings in 1902 and the surge of documented mixed-use buildings in 1955. It cannot be definitively said why separate dwellings are differentiated from their fellow residential buildings, but these separate dwellings are commonly associated with a half address (see Figure 5.1).

Figure 5.1: 1902 Sanborn maps provided by the Charleston County Library showing examples of separate dwellings within the walled city. Including 56.5 Church, 52 Church, 9.5 Stoll’s Alley and 7.5 Stoll’s Alley.
Further research will need to be completed into residency and historic postal laws to determine whether a separate family inhabited these separate buildings, a common occurrence today, or if they were owned and used by one family. As seen in Table 5.9, the number of separate dwellings spiked to eighty in 1902 and decreased in 1955 to fifty-two but still made up a large percentage of building use, at 11.18 percent. While the background of the separate dwelling was unclear, they continued to be of relevant use throughout the years within the walled city.

Table 5.9: Showing Sanborn year referenced and number of separate dwellings surveyed.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Separate Dwellings Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1844</td>
<td>0 of 493 outbuildings in 1844</td>
</tr>
<tr>
<td>1902</td>
<td>80 of 455 outbuildings in 1902</td>
</tr>
<tr>
<td>1955</td>
<td>52 of 465 outbuildings in 1955</td>
</tr>
</tbody>
</table>

In 1955 the idea of the live-work space within a single building rather than multiple buildings on a property was formalized in the Sanborns. Mixed-use buildings gave a building owner the option to rent out multiple forms of space and it gave commercial owners the ability to live a floor level away from their business. This provided more security and increased property income. Evident in Table 5.10 the incorporation of mixed-use buildings was completely absent in 1902 but 1955 saw a major increase in mixed-use presence. It was not a new phenomenon as 1884 had a limited number of buildings categorized for more than one use, thus they were mixed-use buildings. It is simple to change the interior building space to accommodate this type of use. After acquiring the correct building and zoning permits easily, property owners were taking advantage of converting a single-family building into a mixed-use building.
Table 5.10: Showing Sanborn year referenced and number of mixed-use buildings surveyed.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Mixed-Use Buildings Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1884</td>
<td>9 of 493 outbuildings in 1884</td>
</tr>
<tr>
<td>1902</td>
<td>0 of 455 outbuildings in 1902</td>
</tr>
<tr>
<td>1955</td>
<td>67 of 465 outbuildings in 1955</td>
</tr>
</tbody>
</table>

Properties could be owned and used by single families, companies, or by numerous groups of people at one time. The ability for a single property to house residential, commercial, and storage space all at the same time was due to the implementation of the mixed-use building. This concept that the organization of domestic work and lodging worked as an interrelated unit is supported by Bernard Herman who explains, “Andrew Miller [when giving testimony in Billy Robinson’s defense] described a house one room wide and two rooms deep where he lived with several other white lodgers occupying different rooms. Behind the house stood Miller’s kitchen, and for three years Billy Robinson lived in its second-story apartments.”41 This presents more reason to differentiate each building very specifically for legal documentation purposes.

The spatial analysis questions used in this thesis seek to explain patterns found within the walled city related to construction evolution and to a degree human behavior in terms of use of space and formality of architectural expression. These questions will employ image analysis to help detect any changes over time and are a tool to answer the critical questions of how outbuildings have evolved.

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**Connection and Accessibility**

It is important to understand how buildings are connected or attachment to one another progressed between 1884 and 1955. Between 1884 and 1955, the majority of back buildings were detached even though the number of attached and hyphenated back buildings increased. Seen in *Figure 5.2* detached, attached, and hyphenated back buildings were not localized to certain areas within the walled city. Each type of attachment was dispersed throughout the survey area. Because of Charleston’s rapid growth, fire became a big issue. To mitigate this problem, buildings were built with fire resistant materials and were constructed as separate buildings to discourage spread. Accordingly, 1884 shows very few attached or hyphenated outbuildings. The detached secondary buildings made up 64.71 percent of the buildings within the walled city. However, as building technology progressed, the need to build separate buildings abated and more attached and hyphenated outbuildings were constructed within the walled city. Therefore, the construction of a newly detached back building became rarer over time.
In 1902, the majority of back buildings continue to be detached and there were thirty-eight fewer buildings that are surveyed but the number of attached secondary buildings has a 9.38 percent increase while the number of hyphenated buildings has a 1.33 percent decrease. Within these eighteen years between 1884 and 1902, Charleston property owners showed a willingness to build more buildings connected to the main property building. Seen in Figure 5.3, the type of attachment in back buildings continues to be dispersed throughout the boundary area. This indicates back building attachment was decided based on the preferences of the property owner rather than what on trends in the surrounding area.
Between 1884 and 1955, there is a steady decline in detached buildings with an increase in attached and hyphenated back buildings (see Table 5.11). Of the detached buildings, 48.54 percent were used as public or private garages. Figure 5.4 shows every detached building within the walled city and the dense areas of the garages throughout the city. Clearly noted are the dense clusters of garages that make up half of the detached outbuildings and the biggest clusters are localized around Church Street, a main street that lacks space for on street parking.
### Table 5.11: Showing Sanborn year referenced and number of detached dwellings surveyed.

<table>
<thead>
<tr>
<th></th>
<th>1884</th>
<th>1902</th>
<th>1955</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Detached</strong></td>
<td>319</td>
<td>256</td>
<td>206</td>
</tr>
<tr>
<td><strong>Hyphenated</strong></td>
<td>77</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td><strong>Attached</strong></td>
<td>87</td>
<td>123</td>
<td>174</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

Outbuildings have historically been used to accommodate the work needs of the property owner. While outbuildings were not used as kitchen or laundry space or to provide servant housing in the later Sanborns surveyed, these buildings were still purposefully designed to adapt with new tastes. As industrialization and the automobile became popular, outbuildings transitioned to accommodate these new trends. This transition to industrial accommodation is shown in Figure 5.4 as the garage is used throughout the survey area and a majority of the detached back buildings were repurposed for vehicles.
Building location and accessibility work in tandem to form how a property should be entered and to represent estate formality. Answering where outbuildings were located and how outbuildings were meant to be accessed gives an understanding of the property formality and arrangement for social interaction. From the beginning of Charleston’s settlement, high style property layout included the main house with secondary buildings arranged in a linear fashion within a compound and occasionally filled with livestock and gardens. Within the urban context, these elements would also be seen in some form in middle- and lower-class areas of town. Lower-income properties would have these same urban components at a smaller, less substantial and
more public way. In these areas, outbuildings would have been shared by multiple families and orientated at the back of the property along a rear wall.\textsuperscript{42} Evidenced in Figure 5.5 are upper-class and middle-class properties located in Charleston between 1750 and 1850. As the years progressed the dense area of downtown urban Charleston changed.

The 1884 Sanborn Maps show outside of the high style urban plantation properties (such as the Heyward-Washington House at 87 Church and the Edmondston-Alston House at 21 East Battery), property lines were much more lenient, allowing buildings to be constructed in the free space that was available rather than standing within strict boundaries. This was in part due to the more public livable space that defined the early nineteenth-century peninsula. The 1884 Sanborns

\textsuperscript{42} Martha Zierden, \textit{Carolina’s Historical Landscapes: The Urban Landscape in South Carolina}, (Knoxville: University of Tennessee Press, 1997), 166.
themselves lack property lines differentiating each property from one another, making the properties much more accessible but more difficult to read (see Appendix D).

The 1902 Sanborn Maps show a more organized environment and planning strategy. The Sanborn Maps from this year show that the linear property layout continued to serve as a basic pattern. The main buildings resided on the street and the back buildings fell directly behind. The 1902 Sanborn Maps show a more organized peninsula by differentiating each property, unlike the 1884 maps (see Appendix D). Moving into 1955, each property is clearly distinguished from the other and it is evident which outbuildings are associated with each primary building. The organization and clear delineation represent a strong influence of enforced zoning regulations and design guidelines to ensure a specific sense of place. Along with property element evolution, formality plays a major role in what type of outbuildings were present on the property and where they were placed.

Before the city’s Board of Architectural Review came into effect in 1931, owners designed their property to show their prestige, while also being able supporting domestic work. Charlestonians work and live spaces have been combined on a single property from colonization to contemporary times. Because properties have been used for multiple purposes, a sense of formality was put in place to assist visitors coming to the property. A constant micro-pattern was seen from property to property from 1884 through 1955. Property “organization shifts from predominantly social [primary dwelling] to predominantly utilitarian [work houses] spaces.”43 Additionally, building use influences outbuilding location. Seen in Figure 5.6 at 922 Church Street, now 109 Church, the bakery and oven of a commercial confectionary and bakery is set back and isolated at the back of the property. Much of the work was completed in this building and the high

level of flammability and lack of high-profile visitors coming to that location place it in isolation at the back of the property, even while the surrounding buildings are dense and clustered without property discernment. This developed sense of formality also created various forms of property accessibility.

![Sanborn Sheet 12 showing 922 Church Street, now 109 Church Street, and surrounding density provided by Charleston County Library.](image)

The survey completed for 1884, 1902 and 1955 represents six different forms of entry (see Table 5.12). The forms of accessibility of the secondary buildings occurred most frequently in one of two paths: through the primary building; through multiple forms of entry. However, no patterns or trends exist that explain the evolution of property accessibility. Bernard Herman states, “The extended single house plan consisted of a series of interconnected functional zones that
communicated with one another and with the street via a number of routes.”44 Because mixed-use buildings became so prominent and single properties had numerous buildings with various forms of use, multiple entrances were used so multiple people could come onto the property without the obligation of interacting with other visitors or workers.

Table 5.12: Accessibility percentages from 1884, 1902 and 1955.

<table>
<thead>
<tr>
<th>Form of Entry of Outbuilding</th>
<th>1884</th>
<th>1902</th>
<th>1955</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Main Road</td>
<td>.609%</td>
<td>.4395%</td>
<td>1.720%</td>
</tr>
<tr>
<td>Through back entrance to property</td>
<td>.203%</td>
<td>2.198%</td>
<td>.430%</td>
</tr>
<tr>
<td>Through Side Entrance</td>
<td>6.897%</td>
<td>3.3%</td>
<td>6.667%</td>
</tr>
<tr>
<td>Through property passageway</td>
<td>6.693%</td>
<td>11.87%</td>
<td>12.043%</td>
</tr>
<tr>
<td>Through primary</td>
<td>27.99%</td>
<td>23.74%</td>
<td>27.53%</td>
</tr>
<tr>
<td>Multiple Entrances</td>
<td>57.606%</td>
<td>58.46%</td>
<td>51.61%</td>
</tr>
</tbody>
</table>

The use of multiple property entrances continues to be used today. Residential, commercial, civic and storage space can all be present within one property or a single building. Even with these separate uses, various people can use the property without meeting each other. These various entries are purposeful and each entry is placed specifically to lead different visitors to distinct areas. This is another design technique found in Charleston that represents how designers were thinking about human interaction and their attempt at controlling these connections.

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Chapter 6: Conclusion

Urban outbuildings are significant to Charleston’s history. They were used as live and work space and are vital for a property’s economic success. These purpose-built buildings explain much about changing patterns in Charleston’s oldest district. These buildings are essential in understanding the peninsula’s socioeconomic history.

Charleston’s initial settlement was slow but prosperous and led to an economically thriving port city. This financial success led to significant construction downtown and created a very dense city. Represented by Bishop Roberts in a perspective drawing completed in 1762, Roberts shows the busy, dense city still protected by fortification walls (see Figure 6.1). The architecture represented in this sketch shows buildings of various forms and materials. In the far right of Figure 6.1 a small open area shows some outbuildings. These are located behind the primary building, smaller than the primary, and square in shape, features consistent with the outbuildings seen in the first Sanborn maps of 1884. Though the characteristics of the buildings depicted are similar between the 1762 drawing and the 1884 map, multiple fires and other climatic events destroyed any original buildings from the 1670 settlement, so the buildings seen on the 1884 map studied in this thesis are likely not the earliest incarnation of outbuildings on the peninsula.
Accessory buildings situated behind the primary residences make up a large percentage of Charleston architecture. Of the 2,211 buildings surveyed, 798 were primary buildings and 1413 of the were secondary buildings. It is their varied use, quantity, construction techniques and arrangement that make these buildings distinct unto themselves but necessary elements to a larger context. Bernard Herman argues, “In Charleston, the main dwelling represented only one element in an ensemble of buildings that included kitchen, washhouse, quarters, privies, stables, work yards, gardens, and a variety of other buildings, ranging from rickety garden sheds to two-story brick warehouses.” Survey data analysis of these essential property elements between 1884 and 1955 show urban outbuilding construction, placement and implementation was a response to social preferences, industrialization and economic expansion.

The survey developed for this thesis led to observations about how the primary buildings and secondary buildings were architecturally related as a group and how property layout changed

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between 1884 and 1955. The comparative architectural analysis of the primary and secondary buildings within the walled city presented in chapter five reveal several trends that existed within the walled city related to building form, enclosure ratio, building use, building access and location and building connection. However, there are four major findings seen in the data of this thesis: material consistency remains the same up until 1955, building program hosts a large variation in activity, property layout is influenced by the townhouse plan, and multiple forms of access are the most common form of entry between 1884 and 1955.

First, the years 1884 and 1902 show little variety in building materials used on primary and secondary buildings. Majority of the primary and secondary buildings were constructed with wood and brick. Rather than a gradual increase in variety, 1955 shows a dramatic spike in the number of building materials used in construction. In 1884, four types of materials were used; in 1902, five types of building materials were used; and in 1955, thirteen types of materials were used. Charleston experimented in the use of building materials like metal, concrete, metal cladding, adobe and asbestos. The increase in buildings materials in 1955, decreases the chances of the front and back buildings using similar materials. Main buildings in 1955 only had four materials that were used for construction (brick, concrete, frame and iron) while there were ten or more building materials that were being used to construct secondary buildings (see Appendix C). This material evolution was a clear response to the industrialization of building technology within Charleston.

A second main finding is that the program or building use of back buildings consistently shows a large variation of activities. Secondary buildings present between 1884 and 1955 are: commercial, mixed use, residential, servants’ quarters, kitchens, junk, ruins, old, separate dwelling, tenement, et cetera. Additionally, there was little evidence that primary building use influenced how the secondary buildings were used. There are twenty-six commercial back buildings in 1884, which are demolished and replaced with residential buildings and other small businesses. This
changes again in 1955, as the number of commercial back buildings increases to 111, similar to the 106 commercial back buildings surveyed in 1884. The large variation of building use is due to Charleston’s active economic expansion. Urban properties in Charleston have consistently houses multiple buildings with numerous uses. This continues between 1884 and 1955 because Charleston’s economy has continued to expand, causing a consistent need for large building program variation in the back buildings and in the primary buildings.

The presence of the public and private garages added a building use to the twentieth-century Sanborns. This building use was a byproduct of industrialization and compiled 21.51 percent of the outbuildings on the peninsula and added variation to the typical linear property format (see Figure 6.2). The obsolescence of stables and sheds coincided with the appearance of the garage. The emergence of garages also increased the variety of back building location, rather than only being located directly behind the primary building. In Figure 6.2, garages can be placed directly behind the primary, on the side of the property and in front of the main dwelling. The incorporation of public and private garages add variety to Charleston’s typical linear pattern, a property layout that was not present in 1884 but was strictly incorporated in 1902. Properties within the walled city in the 1884 Sanborn show the most irregularity in building layout. In 1884 buildings were used much more publicly and there was a dense urban environment which was not prevalent in 1902 and 1955. Buildings were constructed in any available lot space that was in general proximity to the main building in 1884. In 1902, buildings are demolished and planned development occurs, which enforces the linear townhouse layout. While this linear format continues in 1955, the presence of the garage added more variety in property layouts found within the historic walled city.
A third main finding is that analysis of the spatial patterns and element arrangement reveals outbuilding attachment and placement were generally influenced by the typical linear townhouse plan (see Figure 6.3). Apart from the incorporation of the garage, “standard arrangement of a lot placed the principle dwelling on the street, usually with several possible paths of access”46 leading into the open yard space and additional outbuildings that would have been located directly behind the primary building. This basic orientation of various buildings on site was most prominent in 1902, after the refinement of the urban density in 1884 and before the

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contemporary use of the garage in 1955. Based on literature and archaeological studies, this linear building arrangement was organized from street to backyard and decreased in formality. The residence was in the front followed by the garden, work yard and work houses. This format and the institution of multiple forms of building use within a single property allowed for multiple forms of entry and multiple forms of building attachment. The incorporated linear plan in 1902 and future divergence of the linear plan in 1955 are both influenced by the social preferences of the property owners and the need to adapt to the post-industrial peninsula.

The final main finding showed the data collected from the 1884, 1902 and 1955 Fire Insurance Maps showed multiple forms of entry were the dominant form of accessibility, specifically within the domestic urban compound (see Table 6.1). The year 1884 and 1902 show more than fifty percent of the properties surveyed allowed for multiple forms of access. In 1955, less than fifty percent of the buildings surveyed were constructed with multiple forms of entry. This percentage decrease is caused by the increase in the other forms of access points. In 1955, 128 properties surveyed were entered directly through the primary, unlike 108 in 1902; thirty-one properties surveyed were entered through a side entrance directly into the property, unlike fifteen in 1902; and fifty-six properties surveyed were entered through a property breezeway, unlike fifty-four in 1902.

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<th>Year</th>
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<td>1955</td>
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Table 6.1: Percentage of properties with multiple access points in 1884, 1902 and 1955.
“Typically, a white visitor or resident would enter the domestic lot through a main door or
gate facing or embedded in the principal house façade. Enslaved and free people typically entered
the domestic lot through a gate or door located to the side of the main house and on axis with the
service buildings and spaces known as the backlot or... the yard.”47 Because multiple building types
with multiple purposes reside on a single property, various entrances exist to insure a sense of
formality and differentiate the social space from the utilitarian space. Accessibility to these
domestic landscapes define centuries of social context and property security but fades by 1955
when more outbuildings became residential. While the data shows a decrease in the use of multiple
access points in 1955, in the twentieth-century the use of multiple forms of entry was the most
common form of accessibility because Charleston lots continued to include various multi-use
buildings with numerous tenants. All of which needed separate access points to enter their
personal property.

47 Gina Haney, *Slavery in the City: Understanding Antebellum Charleston Backlots through Light, Sound, and
Action,* (Virginia: University of Virginia Press, 2017), 96.
A second aspect to the Charleston townhouse property that influenced spatial patterns and multiple forms of entry was back building connection. Between 1884 and 1955, the majority of back buildings were constructed detached from the primary building. However, as the years progressed, the number of attached and hyphenated outbuildings within the walled city increased: from seventy-seven hyphenated buildings and eighty-seven attached buildings in 1884; to sixty-five hyphenated buildings and 123 attached buildings; and sixty-five hyphenated buildings and 174 attached buildings in 1955 (see Figure 6.4). Even with the decrease of free-standing buildings over the three study periods, detached buildings continue to dominate the peninsula. Compared to 1884, the number of attached back buildings found within the walled city in 1955 increased by 19.78 percent. This also enforced the pattern of building properties linearly; attached and hyphenated back buildings would be constructed directly behind the main building, creating a line of buildings from the street front to the back of the property. Property accessibility was a response
to the property owner preferences and the property program. Property entry was used to guide visitors. The need to a certain access point was determined by the property owner, the use of the buildings of the property, and how the property owner chose to guide visitors. As properties and building program change, accessibility evolves as well.

![Building Connections within the Walled City Chart]

Figure 6.4: Buildings connections within the walled city in 1884, 1902 and 1955.

The data collected and analysis completed on the Charleston outbuildings within the walled city shows several major patterns to the character and site layout of back buildings. Researchers, historians, preservationists and the community should possess an understanding of the evolution, history and the fundamental purpose of Charleston’s urban outbuilding. This understanding combined with the responsibility of stewardship for these buildings and their history will ensure some of these buildings will not be destroyed or demolished. The presence of these outbuildings will only continue to foster Charleston history and the peninsula’s historic integrity by representing a social and economic class is often overlooked. 

103
The research for this thesis has occurred at a time when researchers, historians and advocates for the preservation of the working class and slave population built heritage are commanding much academic attention. The buildings studied in this thesis were used as live and workspace for these men and women and understanding these buildings will offer more insight into the history of this citizen group. It is the hope that this study will provide contribution to the field and can be used in support for further research and study. The findings and analysis of this thesis should live on through further research into how buildings within the walled city have evolved between 1884 and 1955 and into the twenty-first century. This additional facet will add to the timeline of back building evolution and will explain how contemporary influences have changed these back buildings, how they have influenced patterns and trends, and will show how current Charlestonians have embraced back building architecture.
Bibliography


http://www.carolana.com/Carolina/Documents/fundamental_constitutions_overview.htm


APPENDIX A: 1884 SECONDARY BUILDING DATA

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<th>Through primary</th>
<th>Through property corridor</th>
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### Location

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APPENDIX D: SANBORN FIRE INSURANCE MAPS

1884 Sanborns

Sheet 11
Sheet 69