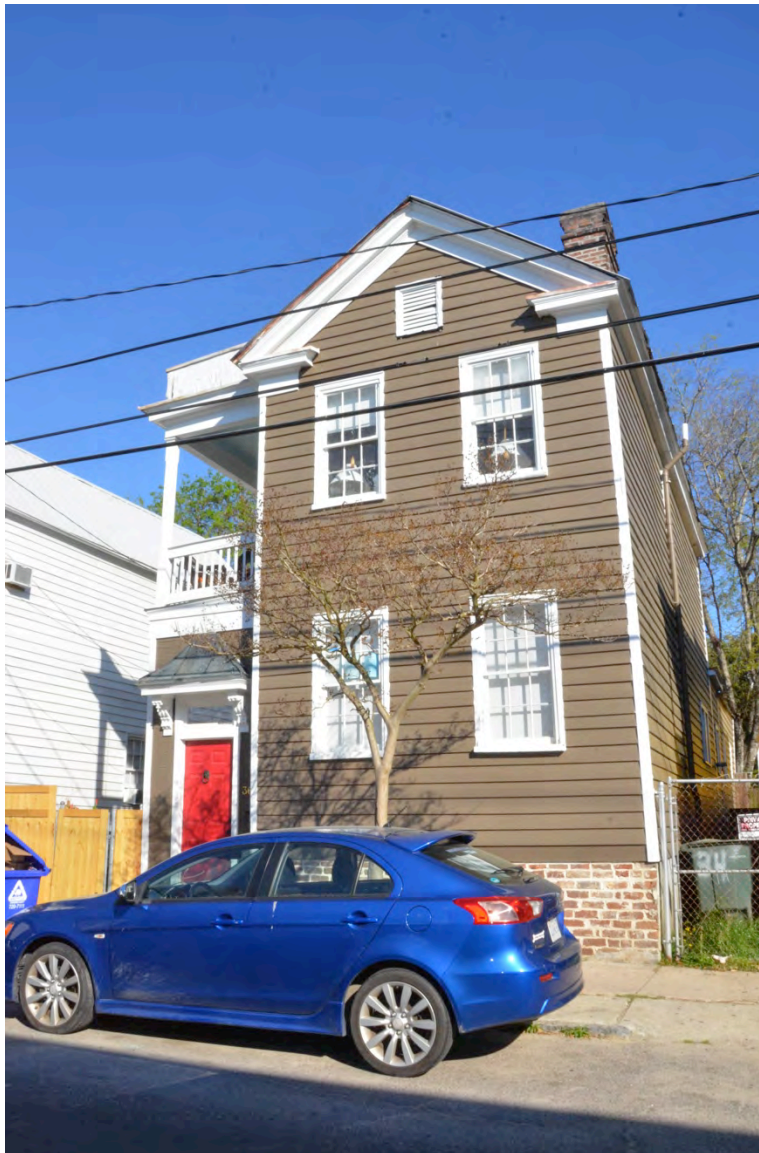


**A STRUCTURAL INVESTIGATION OF  
36 REID STREET  
CHARLESTON, SOUTH CAROLINA**



Submitted to Craig M. Bennett, Jr.  
April 26, 2016

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## INTRODUCTION

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In the Spring of 2016, as a requirement of the *Case Studies in Preservation Engineering* elective class of the Graduate Program in Historic Preservation jointly between Clemson University and the College of Charleston, Amanda Brown (student) conducted a structural investigation of the house located at 36 Reid Street in Charleston, South Carolina. The study was to include a conditions assessment, photographic documentation and an AutoCAD drafting of the primary elevation – the south facade – and a floor plan of the first level.

In the Summer of 2015, prior to this structural investigation, Amanda Brown had the opportunity to crawl underneath 36 Reid Street while areas of the brick foundation were being rebuilt and repointed, and deteriorated structural members were being replaced. The observations from this impromptu investigation are incorporated into the report and referenced as likely conclusions for some of the more recent findings. During this initial investigation, the owner, Richard Clark provided information about recent (2013-2015) repairs to the first floor framing of the house.

On March 19-20, 2016, Amanda Brown completed a more thorough structural assessment of 36 Reid Street. Brown investigated the interior of the first floor of the main house, hyphen and dependency, as well as both the first and second levels of the piazza. The first floor framing was analyzed from the crawl space; this analysis was limited to the original area of the main house. The north, south and west exterior elevations were also evaluated. The east elevation of the house, the attic and the roof were inaccessible.

During the on-site investigation, the first floor of the structure was hand-measured and drafted, as was the south elevation facing Reid Street. Additionally, photographs were taken to convey the findings of the investigation and the current condition of the house. These are included within the appendix.

This report presents findings, conclusions, and recommendations concerning the structure at 36 Reid Street to the client, Craig M. Bennett, Jr.

## **BRIEF HISTORY AND DESCRIPTION**

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36 Reid Street is a Charleston single house located on the Eastside of Charleston, near Hampstead Village. The house is located on the north side of the street on a 35 x 81 foot lot near the intersection of Reid and America streets. Its current use, as it has been since it was erected, is a place of residence, although the structure has since been divided into two apartments. The house is a two-story wood structure on a brick foundation with a one-story dependency now attached by a hyphen. There is a two-story piazza on the east façade of the house. The building comprises approximately 1800 square feet with four bedrooms and two bathrooms. 36 Reid Street was most recently purchased in 2012 and underwent a significant renovation from 2013-2014. Minor cosmetic work is still being completed on the exterior of the house.

Hampstead Village and the land surrounding 36 Reid Street was originally laid out by Henry Laurens in 1769 as a suburb of the city. With an emphasis on open space, Laurens assumed the area would be popular with wealthy Charleston residents looking to escape the density of the lower peninsula. However, urban development and the Industrial Revolution instead attracted manufacturing facilities. Lower real estate values, relaxed building restrictions, access to the harbor and proximity to the railroad spurred the establishment of factories and the influx of the working class to the neighborhood.

Based on chain-of-title research, plats, the Charleston City Directories, historic images and Sanborn Fire Insurance maps, the original construction of the house is dated between 1852 and 1871. Throughout history, the occupants of 36 Reid Street have been primarily working class and middle class tenets including laborers, bakers, policemen and employees at the naval shipyard. From its original construction through the early 1900s, the owners of the property were predominantly wealthy individuals who owned multiple properties or estates in the area, renting the rooms to lower class occupants. The main house was rented separately from the dependency at the rear of the property and it was not until the 1950s that the outbuilding was connected to the main structure with a hyphen. From the 1850s until the 1900s, the structure was occupied by single, male African-American laborers. The structures on the property served as a “Negro tenement” after the Civil War. In the early 1900s the demographics shifted and the

occupants were mostly white middle class families. The demographics of the neighborhood again changed in the 1930s and the Charleston City Directories indicate middle class African-American occupants. The house was vacant during the 1970s and 1980s leading to some structural issues observed present-day.

The Earthquake Records of 1886 indicate that 36 Reid Street sustained damage, but was in decent condition. The Records dictate that the chimney on the north wall of the main house should be rebuilt. However, this recommendation was never implemented; the remnants of the chimney's foundation are still visible beneath the house and the bricks can be found in the abandoned cistern under the living room. The house underwent a major alteration in the early 1950s. The dependency was connected to the main house with a one-story hyphen, and its piazza was enclosed as a hallway. Additionally, at this time the back portion of the piazza of the main house was enclosed and extended, forming the present-day kitchen. During these alterations, external stairs were added to the piazza. Since 2012, the owners of the building have replaced rotten siding and other areas of deteriorated wood, repaired portions of the roof and repainted the entire structure. The first floor of the structure underwent a significant interior renovation in 2013.

## FINDINGS

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Following are findings made by observation during the structural investigation of March 2016:

### Exterior Envelope

- The structure is wooden framing on a brick masonry foundation. A modern stucco veneer now covers the bricks, with the exception of the south elevation of the foundation. In this area, the original brick foundation was exposed, rebuilt and repointed as necessary during the Summer of 2015. (Figures 7 – 14)
- A significant level of biogrowth and mold/mildew are present on the exterior of the foundation wall on the west side of the hyphen and the kitchen, as well as on the north side of the kitchen. Biogrowth is more prominent near the rear of the house. (Figures 15 and 16)
- Around the foundation of the house, particularly on the west elevation near the back stairs, the soil has washed away from the masonry. (Figures 17 – 19)
- The vertical wood planks of the parapet are severely deteriorated. The rot is most substantial at the base of the parapet. There is also significant paint loss on the parapet. (Figure 20)
- The shutters on the south (primary) façade of the house are missing. Although the shutter pintles have been recently painted, they still show signs of corrosion and rusting. (Figures 21 and 22)
- The wood windowsills, window surrounds and door trim are moderately rotted in several areas. Deterioration is specifically seen at the base of the doorway leading from the rear hallway to the backyard and at the window in the south wall of the kitchen on the first floor. (Figures 23 – 26)
- While the majority of the roof was inaccessible and not visible, the roof over the hyphen of the house showed signs of corrosion and deterioration. The potential for an issue with this roof is reinforced by the presence of water stains on the ceiling of the laundry room. (Figure 27)
- The windows on the south wall of the kitchen addition have shifted within their frames causing millwork deformation. Shifting can be observed at the tops of the windows at

both the first and second floor, as well as where the transom window meets the door frame on the first floor. It is unclear whether the windows have shifted or if this elevation of the house is moving relative to the fenestrations. (Figures 29 – 31)

- Corroded flashing is visible at the gable on the south elevation. (Figure 32)
- The upper portion of the chimney may need to be repointed. However, the flashing surrounding the junction of the chimney and roof appears to be in good condition. This should be confirmed by accessing the roof. (Figure 33)
- Deteriorated rafters are visible at the north wall of the outbuilding. (Figure 34)
- Deteriorated siding has been replaced on all four elevations in the past year. Additionally, the entire house, with the exception of the parapet, has been repainted.

### Foundation

- There are several horizontal cracks on the west elevation of the dependency (now connected to the main house) and the hyphen. These cracks are located near the crawl space ventilation grates and the HVAC system units. There are also several vertical cracks, however, horizontal cracking is more prevalent. It is unclear if the cracks are through-wall or only present in the stucco veneer. Past repairs with Portland cement are visible at some of the cracks. (Figures 35 – 37)
- The west masonry wall of the kitchen addition is bowing outward where the top of the foundation meets the wooden structure. (Figure 38)

### Piazza

- There is a diagonal crack running the length of the south side of the concrete stairs leading from the side yard up to the piazza. It appears that this crack was previously repaired. (Figure 39)
- On this same stair leading from the side yard to the piazza, there is an area of material loss on the top step where the concrete meets the piazza decking. (Figure 40)
- The two columns on the first level of the piazza appear to be splitting. There are vertical cracks along the west and south sides of both columns. These cracks start at the capital and run two-thirds the length of the column. The columns were painted in the past year and the cracks do not appear to be active. (Figures 41 and 42)

- The exterior stairs leading from the first level of the piazza to the second level are severely deteriorated in several areas. The wood on several of the steps has split parallel to the grain and along the length of the step. Additionally, there are several small areas of the stairs where the wood is severely deteriorated and has resulted in material loss. Material loss is typically located near the ends of the individual steps or at the center where the riser meets the tread. Areas of deterioration appear to be related to the horizontal fractures. (Figures 43 – 47)
- Both columns on the first level of the piazza are bowing outward (relative to the piazza) to the west. The columns appear to align with two areas of deformation in the second floor edge beam of the piazza. Both regions of deflection are observable in the upper portions of the columns. (Figures 48 and 49)
- The edge beam at the second floor framing of the piazza has rotated and deformed. At the north column, the edge beam appears to be bowing upward, while at the southern column, the edge beam appears to have deflected or settled downward. The edge beam at second floor ceiling or roof line does not show signs of deformation. (Figures 50 – 55)
- There is a gap where the second floor edge beam connects with the north wall of the kitchen addition. The edge beam is no longer parallel to the ceiling framing and appears to have twisted, further indicating unusual stress on this member. (Figure 56)
- On the second level of the piazza, the area at the south end of the stair opening has dropped slightly relative to the remainder of the piazza floor. This area is approximately 2'-0" by 2'-0". The floor decking appears to be buckling beneath the south column – located in this same area. (Figures 57 and 58)
- The tongue-and-groove flooring on the piazza appears to be in good condition.

### Interior

- There are areas of minor deterioration in the wood flooring. This deterioration is confined to the original main house and can be seen in the present-day front bedroom, entry hall and living room. The flooring in these spaces was not replaced during the recent renovations and is attributed to the original nineteenth century construction. Areas of the flooring with minor wood rot are typically located near the exterior walls of the



house. In some instances, there are regions where a past repair was made with a wood consolidant. These repairs are now failing. (Figures 59 – 62)

- Approximately four floor boards in the southwest corner of the present-day living room are deformed. These boards are located adjacent to the south wall and have twisted creating a void beneath the wall. (Figures 63 and 64)
- There is evidence in the front bedroom for a previous partition wall. Ghost marks are visible on the north and south walls, as well as on the ceiling. These marks align with the front of the brick fireplace, suggesting that the fireplace was once enclosed. (Figures 65 – 68)
- Water stains are present on the laundry room ceiling. This area corresponds with the one-story hyphen connecting the main house to the dependency. From the exterior, the roofing material in this area appears to be corroded and in need of replacement. (Figures 69 and 70)
- In recent years, likely during the 2013-2014 renovation, the fireplace in the front bedroom was repointed. The mortar is now disintegrating leaving a fine sand on the floor surrounding the fireplace. Several bricks on the fireplace and within its box have cracked vertically. Additionally, an appropriate mortar joint was not used. (Figures 71 – 73)
- There are diagonal cracks in the plaster both above and below one of the windows in the south wall of the front bedroom. The cracks extend from the upper left corner and the lower right corner of the window. At the lower right corner, the crack transitions into a vertical crack extending to the baseboard. (Figures 74 – 77)
- The back hallway and the two back bedrooms (the original outbuilding) slope towards the west. The slope is visible at the ceiling, the floor and the trim work of the back doorway. In the hallway this is not surprising as the area was previously a one-story porch and enclosed in the 1950s. However, the slope in the bedrooms is possibly attributed to settlement of the house. (Figures 78 – 80)
- There is mold present on the ceiling of the bathroom directly over the shower. (Figure 81)
- There are multiple campaigns of flooring in the living room. This indicates changes made to the floor plan and possible areas of past deterioration. (Figure 82)

- The floor boards that abut the north and south sides of the fireplace in the front bedroom are not evenly cut resulting in gaps between the floor and masonry. This abnormality indicates that this may not have been the original construction intention. It may be possible that the fireplace was to be enclosed with plaster or flanked on the north and south by millwork. (Figure 83)
- The plaster is failing beneath the window in the east wall of the living room. (Figures 84 and 85)
- There is an area of soft plaster in the east wall of the back bedroom.
- The ceiling in the kitchen addition is visibly sloping to the west; however, the floor appears to be level. (Figures 86 – 88)
- The bathroom floor slopes to the west approximately one inch over a length of five feet. However, the adjacent entry hall is level.

#### First Floor Framing

- At some time after the Earthquake of 1886, a fireplace on the north wall of the living room was removed. The foundation of the fireplace is visible beneath the house, as are remnants of the bricks, now stacked in the abandoned cistern. When constructed, the fireplace served as a structural member of the house. Without the fireplace, the structural integrity of the north wall may have been compromised.
- By observing the framing in the crawlspace from the west elevation of the piazza, it appears that a significant amount of the joists, girders and decking has been replaced with new wood. Additionally, some of the girders and joists have been sistered. This observation is restricted to the piazza framing as the structural framing of the main house was difficult to observe due to ductwork.
- There appears to be some minor deterioration and rot of the girders near their connection to the edge beams and sills.
- Modern concrete masonry units and Portland cement now supplement and strengthen the brick masonry piers throughout the crawlspace.
- The edge beam supporting the south elevation was replaced during the Summer of 2015 due to severe rot.

## CONCLUSIONS

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Based on the findings, the following conclusions were made:

### Exterior Envelope

- Biogrowth is present in areas heavily shaded by trees at the rear of the property. Both the north and west walls – areas affected by biogrowth and mold – do not receive enough sunlight to adequately dry the area. Additionally, without gutters, rainwater runs down the face of the house allowing moisture to sit against the foundation walls fostering an ideal environment for biogrowth.
- Soil washout around the foundation and the rear stairs is attributed to the lack of gutters on the house. Without gutters and downspouts, rainwater is not properly migrated away from the structure.
- The parapet has deteriorated due to its prolonged exposure to both moisture and UV light. Deferred maintenance has increased the deterioration process.
- The shutter pintles, as well as other metal fasteners on the house are corroding due to exposure to moisture.
- Wood millwork on the exterior of the house is deteriorating due to moisture intrusion. Windowsills on the house have begun to deteriorate where their end grain is exposed to water. Door surrounds are most commonly deteriorating where the millwork meets the flashing at the base of the door. The exposed rafters are deteriorating because of a lack of gutters on the house to migrate water away. These areas are all continuously exposed to the weather. Deferred maintenance and a lack of paint has increased the deterioration process.
- The roofing material is corroding due to age and deferred maintenance.
- The appearance of millwork deformation around the windows on the south wall of the kitchen is attributed to the settlement of the west façade of the kitchen addition and the piazza.
- Flashing around the house, specifically at the south gable-end is corroding due to exposure to moisture.

## Foundation

- The addition of pipes through the foundation walls to serve modern utilities and the HVAC units has caused the horizontal cracks seen in the stucco veneer of the masonry foundation. Settlement of the masonry walls and prolonged exposure to moisture may also be causing cracking.

## Piazza

- The diagonal crack on the south side of the stairs in the side yard does not appear to be active. The crack was likely caused by settlement. The missing concrete on the top step was likely caused by an incorrect concrete mixture or inadequate time to set.
- The vertical cracks in the columns located on the first level of the piazza do not appear to be active. The cracks likely appeared during settlement of the piazza or when the exterior stairs were cut into the framing of the piazza, altering the loading stresses.
- The exterior stairs on the piazza are deteriorating due to general wear-and-tear, exposure to weather and deferred maintenance. The steps are splitting along their grain due to stresses. These cracks allow for water infiltration, accelerating the deterioration process of the wood, especially at the exposed end grain.
- The outward bowing of the columns on the first level of the piazza is likely related to the deformation of the piazza edge beam at the second level. The rotation and deformation of the beam suggest unusual stresses on this structural member. The deformation may be caused in part by settlement on the west elevation of the piazza. Additionally, when the exterior stairs were added to the piazza, cutting into and removing structural material, additional loads from the second floor and roof were added to the two columns and the corresponding regions of the edge beam. This change in framing has caused the edge beam to bow upward on the north end, rotating where the beam meets the kitchen addition, and deflect downward at the south end.
- The localized drop in the flooring on the second level of the piazza is likely related to the addition of the external stair and the deformation of the edge beam. This area is adjacent to the stair opening and likely does not have the necessary structural support. The floor decking buckling beneath the column may lack in structural support as well; however,

there may be additional loading issues with the roof framing that are causing unusual stresses on this column.

### Interior

- Areas of deterioration in the wood flooring are relatively minimal and localized. The deterioration is caused by general wear-and-tear, as well as age. Past problems with termites and moisture – during the house's vacancy – may also have caused some of the wood rot.
- Floorboards are rotating in the southwest corner of the living, beneath the entry hall wall due to a lack of structural support. The joists and girders in this immediate area have likely rotted, becoming too soft to support the flooring above.
- The ghost marks in the plaster of the front bedroom suggest that the fireplace was previously enclosed rather than exposed. This does not present a structural issue, only an aesthetic change.
- A roof leak in the hyphen of the house has caused staining to appear on the laundry room ceiling. The water stains developed in the Fall of 2015 following several days of inundating downpours. The roof above this portion of the house is older and from the ground appears to be significantly corroded. Corrosion of the roof material is allowing rainwater to seep into the hyphen's attic area. It may also be possible that the flashing between the main house and hyphen has corroded, no longer effectively serving its purpose of migrating water away from joints.
- An inappropriate mortar was used to repoint the fireplace in the front bedroom. While this does not appear to have structural implications, the mortar has caused several bricks to crack vertically. Additionally, the mortar is disintegrating, leaving a sandy powder at its base. The presence of moisture in the chimney may be causing the mortar to disintegrate.
- The diagonal cracks in the plaster above and below the window in the southwest corner of the front bedroom appeared when structural work was recently performed on the house. During this renovation, the stucco veneer was removed from the south wall of the foundation, revealing brick masonry. This portion of the foundation had to be completely rebuilt as all of the mortar had disintegrated. Additionally, the edge beam sitting on the

foundation wall was severely deteriorated. The beam was removed and replaced. During this procedure, the cracks appeared on the interior of the wall. Movement of the façade during construction and settlement after the renovation caused the cracks.

- The bedrooms at the rear of the house were originally a part of a detached dependency and the back hallway was originally a one-story piazza. It is not surprising that the hallway slopes to the west, away from the bedrooms; the original piazza would have been constructed at a slight slope to shed water. This area was then enclosed to form the hallway. However, it is concerning that the bedrooms also slope towards the west. The slope could be caused by settlement of the west elevation, or deterioration of the first floor framing members in this area.
- The bathroom does not have a ventilation or exhaust fan. Excess moisture from the shower has caused mold to grow on the ceiling.
- The area of plaster fail in the living room beneath the east window was caused when the siding and studs on this wall were replaced in the Summer of 2015. When the rotted framing was removed, the window dropped causing the plaster to crack and fail. The area of soft plaster in the rear bedroom is attributed to moisture intrusion.
- The slope visible in both the kitchen and bathroom are most likely caused by the settlement of the west elevation of the house. Deterioration of the joists and girders in these areas may also be facilitating the slope.

#### First Floor Framing

- Chimneys act as structural members of the building and help to carry the load of the roof and upper stories down to the foundation. Not rebuilding the fireplace on the north wall of the living room compromised the vertical and lateral loading of the house.
- Many of the structural members were replaced within the past three years due to deterioration from moisture and termites. The framing of the piazza likely received the most significant repairs due to its constant exposure to weather.
- Joists and girders were sistered for additional strength where the members had been cut to accommodate modern utilities.
- Modern concrete masonry units were added to strengthen the framing. In some cases, the CMUs were placed specifically where the floorboards tend to bounce and lack support.

## RECOMMENDATIONS

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Based on the findings and conclusions, the following scope of work is recommended:

### Exterior Envelope

- Remove biogrowth and plants against the house and off the foundation. Add gutters and downspouts to the house to migrate water away from the structure and foundation.
- Migrate water away from window and door trim, windowsills and the parapet by installing new flashing. Replace deteriorated wood and repaint where necessary.
- Repair or replace areas of corroded roof material as necessary to prevent water from entering the house, specifically above the hyphen. Ensure that flashing has not corroded at the main house-hyphen junction and at the gable ends.

### Foundation

- Monitor the cracks in the foundation to determine if they are active. The cracks do not appear to be through-wall and do not pose an immediate threat to structural stability.

### Piazza

- Repair the area of missing concrete on the side yard stairs and patch the crack on the stair's south face.
- Remove and replace steps that have deteriorated or split on the exterior piazza stair. These steps should be replaced with a pressured treated wood and painted to keep moisture from entering the exposed end grain.
- Monitor the edge beam deformation and bowing of the columns. Monitor the cracks in the first floor columns of the piazza to determine if they are active. Check both the first and second floor framing of the piazza to determine if the structural integrity of the porch was compromised when the exterior stair was added. Additional framing or shoring may be necessary to account for framing members removed at the stair opening and to mitigate the deformation of the edge beam.
- Sister joists on the second level of the piazza in the area where the flooring has begun to drop.

### Interior

- Repair severely deteriorated areas of flooring with an appropriate wood epoxy or consolidant. Remove areas of failed wood consolidant and replace with an appropriate wood epoxy or consolidant.
- Patch and repair the cracked plaster in the front bedroom and the area of plaster failure in the living room. The area of soft plaster in the rear bedroom should be checked for moisture and repaired.
- Framing should be sistered or replaced as necessary beneath the kitchen and bathroom if the flooring slope in these areas has been caused by deterioration.

### First Floor Framing

- More thoroughly check wood members and their structural capacity in the crawl space to address areas of deformation at the piazza.
- Venture further beneath the structure to check the condition of the girders, joists and beams looking specifically for areas of deterioration due to moisture or termites. Specifically look at the structure where the south wall of the living room meets the entry hall and the floorboards have begun to twist. This location may need additional framing or strengthening with a new masonry pier.
- Sister members where the structural integrity has been compromised, and replace severely deteriorated members as necessary.

While the recommendations described above address all of the findings and conclusions previously discussed, a summary of prioritized recommendations is below:

### Life Safety Issues

- There are not currently any life safety issues at 36 Reid Street. However, the deformation of the piazza edge beam should be monitored for active movement – if active, the piazza will likely need to be closed until shoring can be implemented.



### Immediate or Important Recommendations

- Both the first and second floor framing of the piazza should be checked to determine if the structural integrity of the porch was compromised when the exterior stair was added. Additional framing or shoring may be necessary to account for framing members removed at the stair opening and to mitigate the deformation of the edge beam. A structural engineering should be consulted.
- The corroded roof material above the hyphen should be repaired or replaced to prevent water from entering the house.
- The steps that have deteriorated or split on the exterior piazza stair should be replaced.

### Long-Term Recommendations

- Gutters and downspouts should be added to the house to migrate water away from the structure and foundation.
- New flashing should be installed to migrate water away from window and door trim. Deteriorated wood should be replaced and repainted where necessary.
- To address the interior cosmetic issues, cracks in the plaster should be patched and areas of deterioration in the flooring should be repaired with a wood consolidant.

## SUBMITTAL

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The findings, conclusions and recommendations in this report have been written and reviewed by Amanda Brown and Craig M. Bennett, Jr. for the *Case Studies in Preservation Engineering* class. This report is part of a student project and should not be construed as produced by an architect or structural engineer.

The report is based on information available at the time of the investigation. This excludes the roof, the attic and the second floor framing. If access to and additional information regarding these spaces becomes available, the conclusions and recommendations presented in this report would need to be reevaluated.

Thank you for the opportunity to present a report on the structural investigation of 36 Reid Street.

Sincerely,

A handwritten signature in cursive script that reads "Amanda Brown". The signature is fluid and elegant, with a long, sweeping underline that extends to the right.

Amanda Brown, Preservationist

## APPENDIX A: PHOTOGRAPHS

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*Figure 1.* 1872 Birds Eye View of Charleston.



*Figure 2.* Alfred O. Halsey's Historic Charleston on a Map.



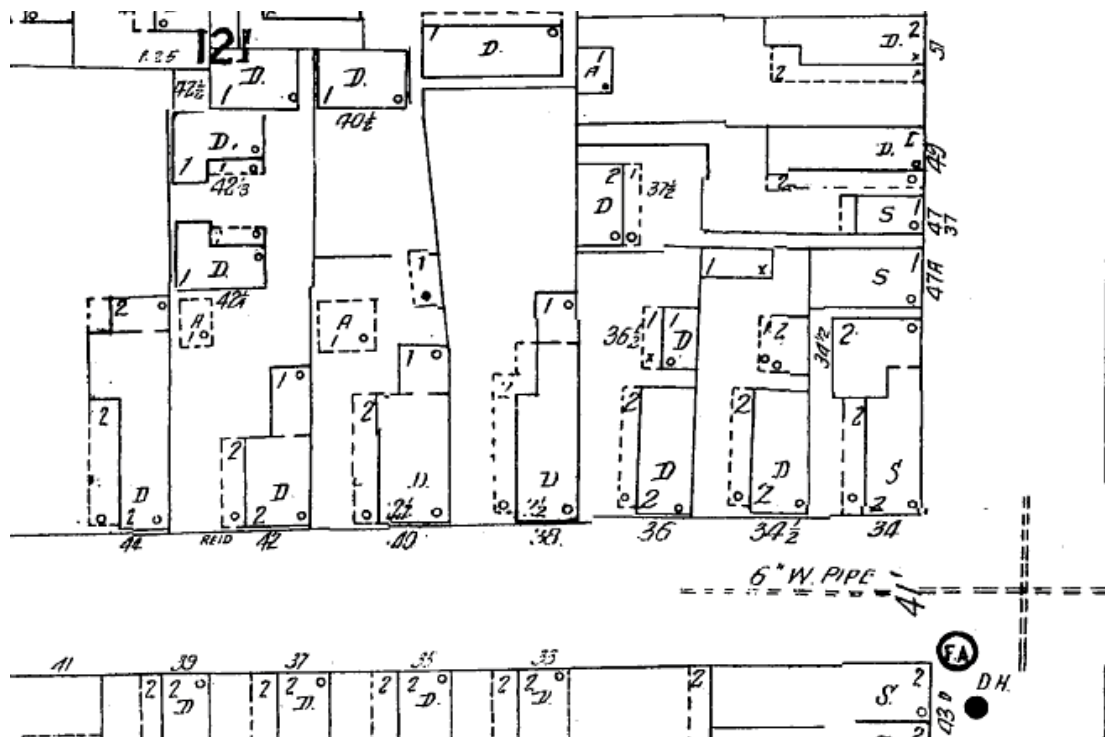


Figure 5. 1944 Sanborn Fire Insurance Map.

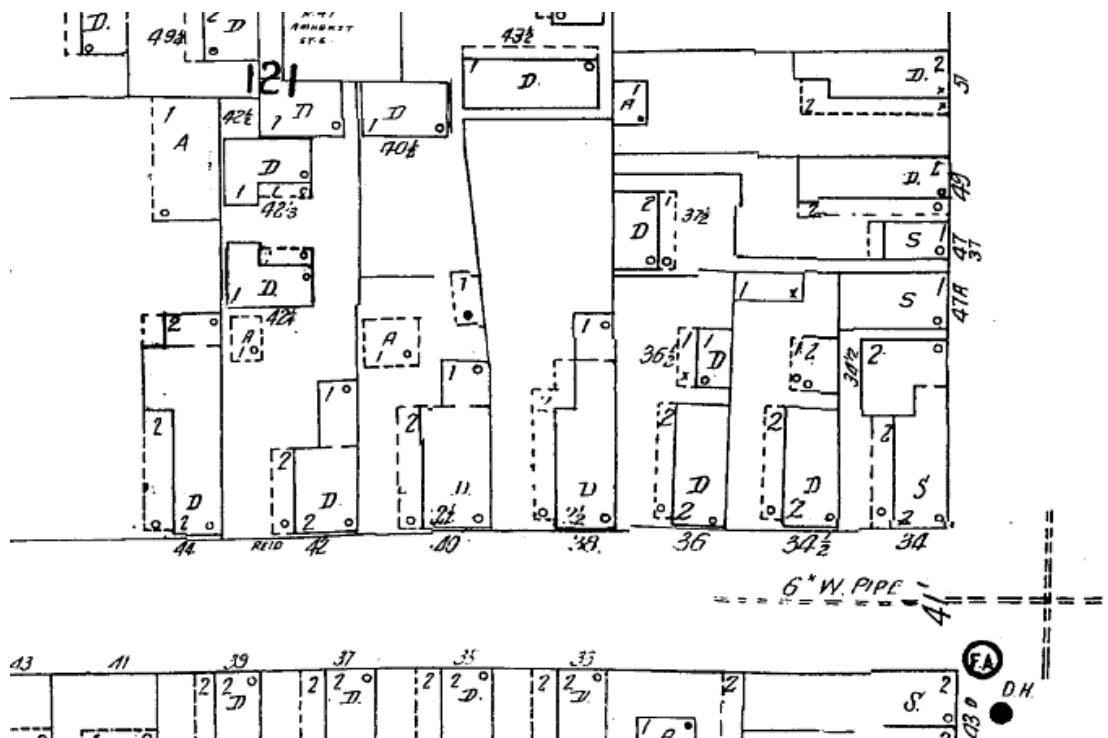
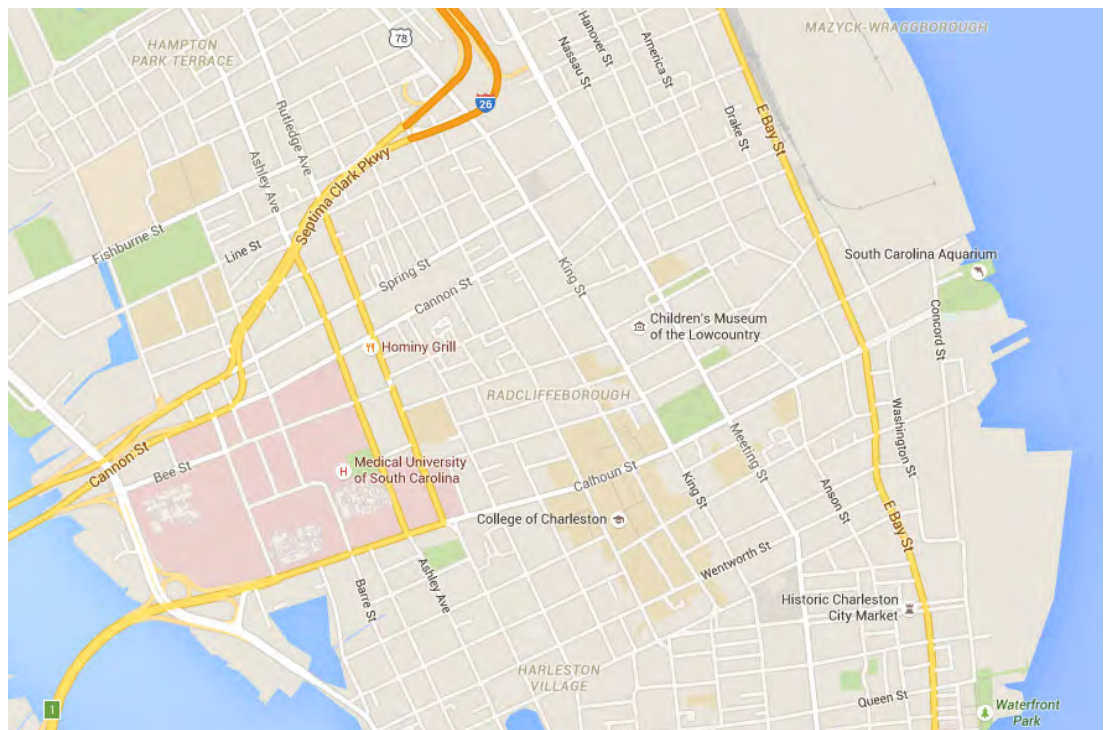


Figure 6. 1951 Sanborn Fire Insurance Map.

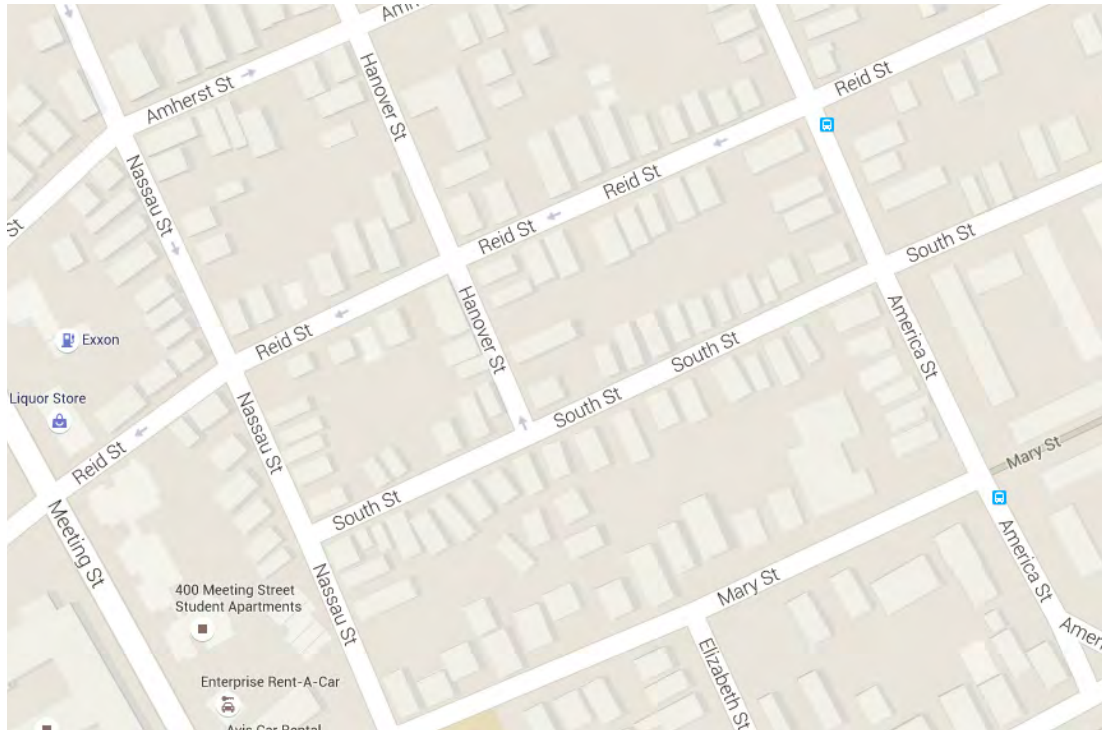




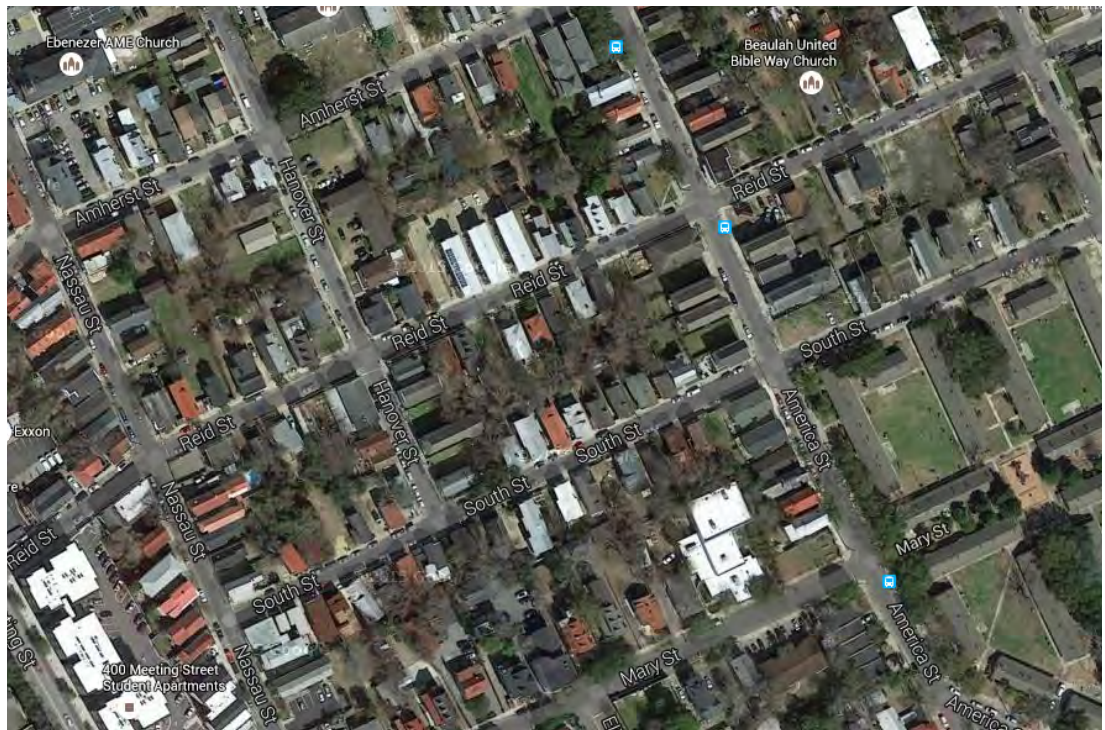
*Figure 7.* 1885 Map of the Eastside Area.



*Figure 8.* Google Map of the Charleston Peninsula.



**Figure 9.** Enlarged Google Map.



**Figure 10.** Google Earth View.





*Figure 11.* South (Primary) Elevation of 36 Reid Street.



*Figure 12.* Southeast Corner of 36 Reid Street.





*Figure 13.* Southwest Corner of 36 Reid Street.



*Figure 14.* Southwest Corner of 36 Reid Street.





*Figure 15.* East Elevation of 36 Reid Street.



*Figure 16.* Outbuilding and Rear of the Main House.





*Figure 17.* Rear Facade of the 36 Reid Street.



*Figure 18.* Repointed South Foundation Wall.





*Figure 19.* Biogrowth at the Northwest Corner of the Outbuilding.



*Figure 20.* Biogrowth on the West Foundation Wall of the Outbuilding.





*Figure 21.* Soil Washout at the Rear Stairs.



*Figure 22.* North Foundation Wall After a Heavy Rain.



*Figure 23.* Soil Washout at the West Elevation.



*Figure 24.* Deteriorated Parapet.





*Figure 25.* Missing Shutters on the South Facade of the House.



*Figure 26.* Missing Shutters.



*Figure 27.* Wood Rot on an Exterior Door Surround.



*Figure 28.* Wood Rot on an Exterior Door Surround.





*Figure 29.* Wood Rot on a Window of the Kitchen Addition.



*Figure 30.* Wood Rot on a Windowsill.



*Figure 31.* Corroded Roofing Material Over the Hyphen.



*Figure 32.* Shifting of Fenestrations on the 1st Level.





*Figure 33.* Shifting of Fenestrations on the 2nd Level.



*Figure 34.* Shifting of Fenestrations on the 2nd Level.



*Figure 35.* Shifting of Fenestrations on the 2nd Level.



*Figure 36.* Corroded Flashing at the South Facade Gable.





*Figure 37.* Loss of Mortar on the Chimney.



*Figure 38.* Deteriorated Rafters Beneath the Gable of the Outbuilding.



*Figure 39.* Foundation Cracks.



*Figure 40.* Foundation Cracks.





*Figure 41.* Foundation Cracks.



*Figure 42.* Bowling of the Northwest Corner of the Kitchen Addition.



**Figure 43.** Diagonal Crack in the Side Concrete Stairs.



**Figure 44.** Loss of Material (Concrete) on the Side Stairs.





*Figure 45.* Splitting Columns.



*Figure 46.* Splitting Columns.



*Figure 47.* Splitting Wood on the Exterior Piazza Stairs.



*Figure 48.* Deteriorated Wood on the Exterior Piazza Stairs.





*Figure 49.* Deteriorated Wood on the Exterior Piazza Stairs.



*Figure 50.* Deteriorated Wood on the Exterior Piazza Stairs.



***Figure 51.*** Splitting Wood on the Exterior Piazza Stairs.



***Figure 52.*** Outward Bowing of the Piazza Columns.



*Figure 53.* Outward Bowing of the Piazza Columns.



*Figure 54.* Deformation of the 2nd Floor Framing Edge Beam.





***Figure 55.*** Outward Bowing of the 2nd Floor Framing Edge Beam.



***Figure 56.*** Outward Bowing of the 2nd Floor Framing Edge Beam.



*Figure 57.* Deflection of the Edge Beam at the South Column.



*Figure 58.* Upward Bowing of the Edge Beam at the North Column.



*Figure 59.* Deformation of the 2nd Floor Framing Edge Beam.



*Figure 60.* Twisting of the 2nd Floor Framing Edge Beam at the Kitchen Addition.





***Figure 61.*** Settlement of the Floor on the 2nd Level of the Piazza.



***Figure 62.*** Buckling of the Floor on the 2nd Level of the Piazza.



*Figure 63.* Deterioration of the Wood Flooring.



*Figure 64.* Deterioration of the Wood Flooring.





*Figure 65.* Deterioration of the Wood Flooring.



*Figure 66.* Failed Wood Consolidant Repairs.



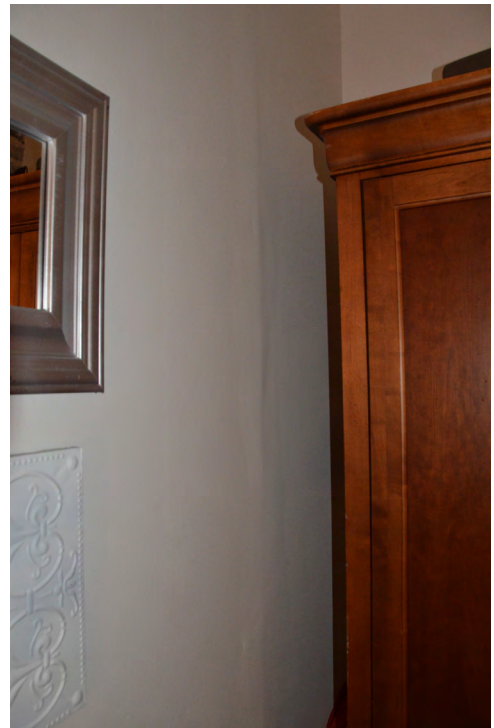
***Figure 67.*** Deformation and Settlement of the Wood Flooring.



***Figure 68.*** Deformation and Settlement of the Wood Flooring.



*Figure 69.* Visible Ghost Marks in line with the Fireplace.

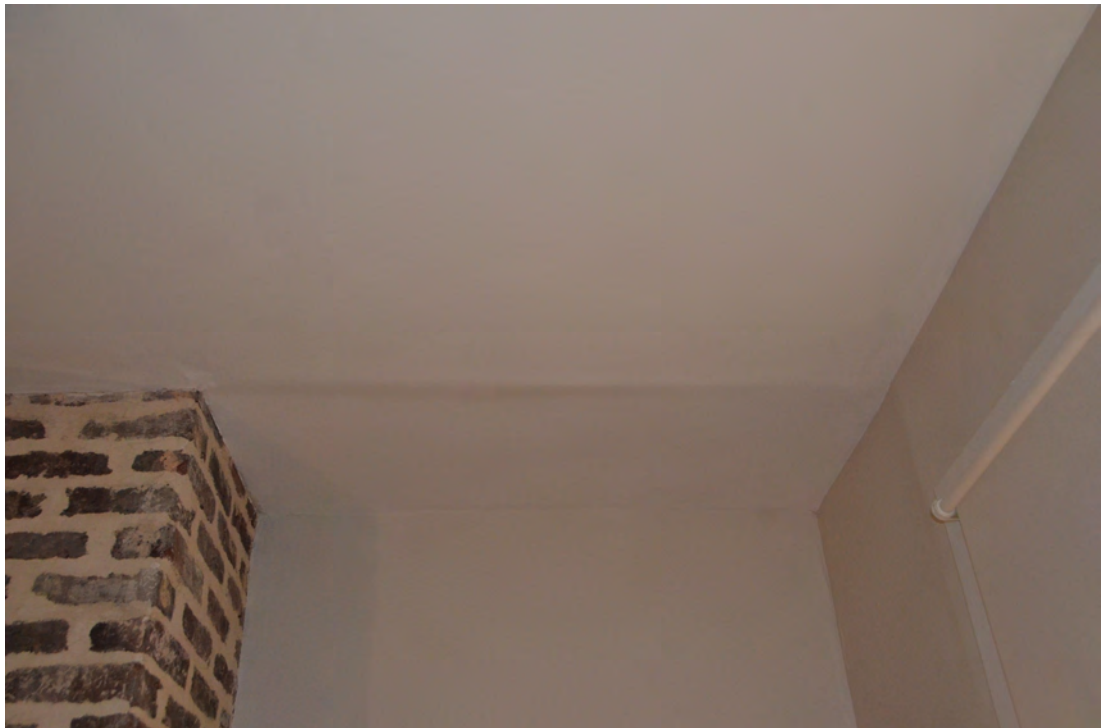


*Figure 70.* Ghost Marks from a Former Wall.





*Figure 71.* Ghost Marks from a Former Wall.



*Figure 72.* Ghost Marks from a Former Wall.



*Figure 73.* Water Stains on the Ceiling of the Laundry Room.



*Figure 74.* Water Stains on the Ceiling of the Laundry Room.



*Figure 75.* Inappropriate Mortar Repair on the Fireplace.



*Figure 76.* Cracking Bricks in the Fireplace Box.





*Figure 77.* Inappropriate Mortar Repair and “Dusting”.



*Figure 78.* Cracking Plaster.



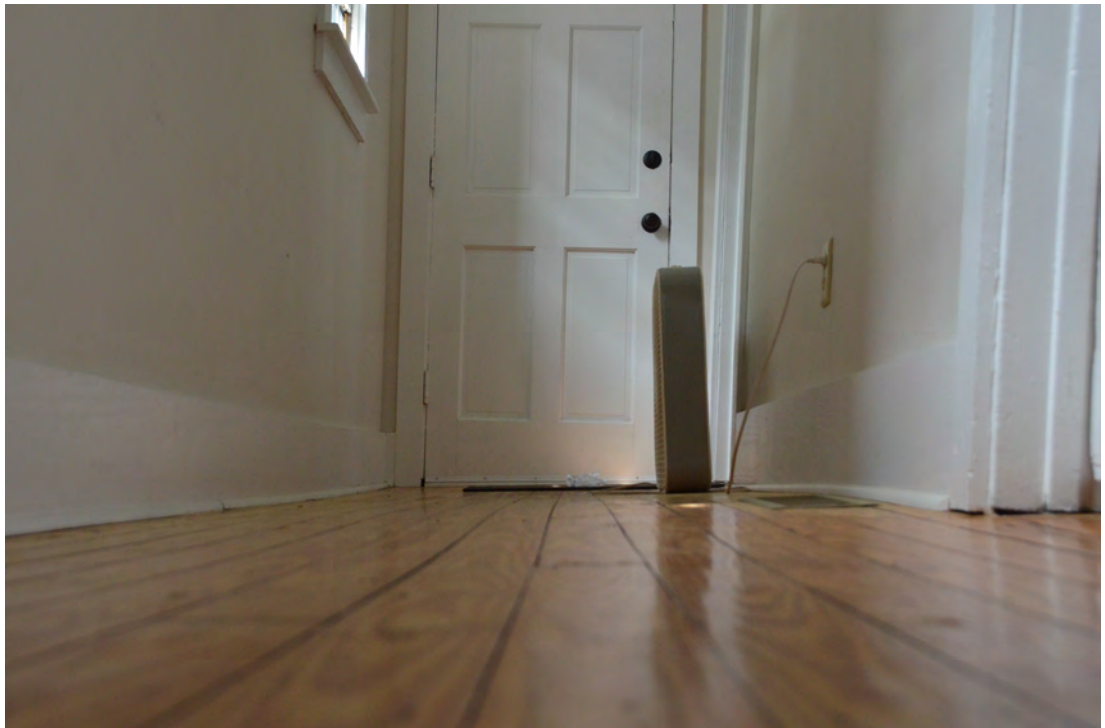
***Figure 79.*** Diagonal Crack in the Plaster at Corner of the Window.



***Figure 80.*** Diagonal Crack in the Plaster at Corner of the Window.



*Figure 81.* Crack in the Plaster at Corner of the Window.

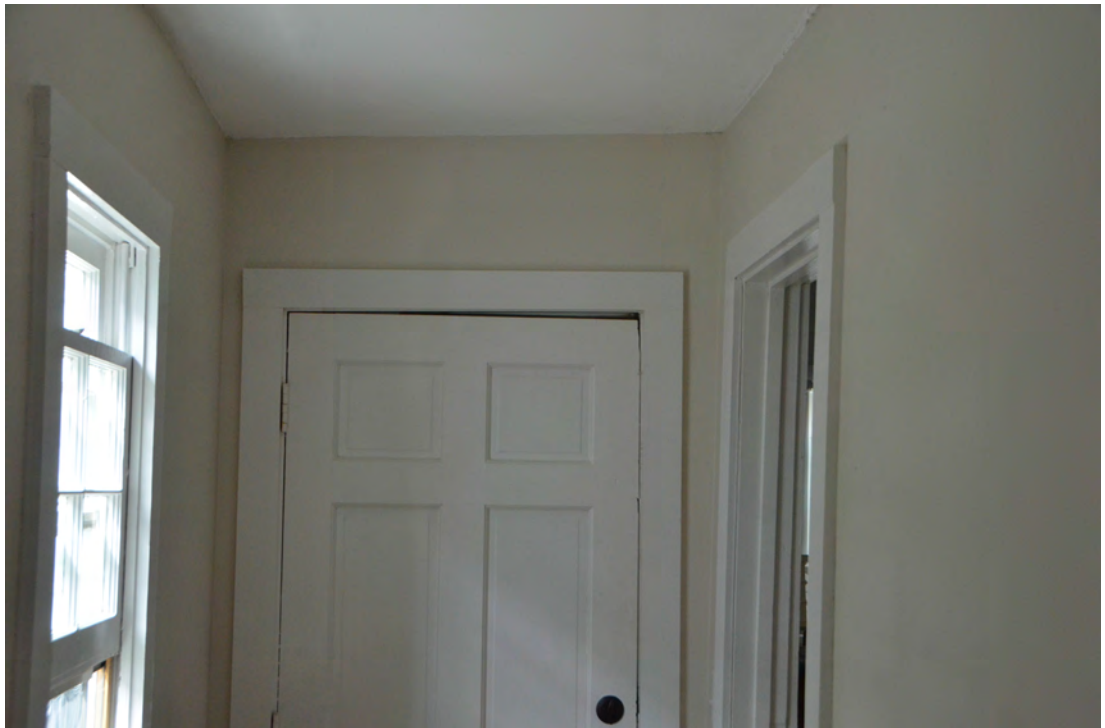


*Figure 82.* Visible Floor Slope in the Outbuilding.





*Figure 83.* Visible Slope in the Outbuilding.



*Figure 84.* Visible Slope in the Outbuilding.



*Figure 85.* Mold in the Bathroom.



*Figure 86.* Living Room Flooring Campaigns.



*Figure 87.* Jagged Flooring at the Fireplace.



*Figure 88.* Plaster Failure in the Living Room.





*Figure 89.* Plaster Failure in the Living Room.



*Figure 90.* Ceiling Deformation in the Kitchen Addition.



*Figure 91.* Ceiling Deformation in the Kitchen Addition.



*Figure 92.* Ceiling Deformation in the Kitchen Addition.



*Figure 93.* New CMUs beneath the house strengthening the masonry piers.



*Figure 94.* Evidence on the left for the foundation of the former fireplace.





*Figure 95.* New framing beneath first level of the piazza.



*Figure 96.* New framing beneath first level of the piazza.

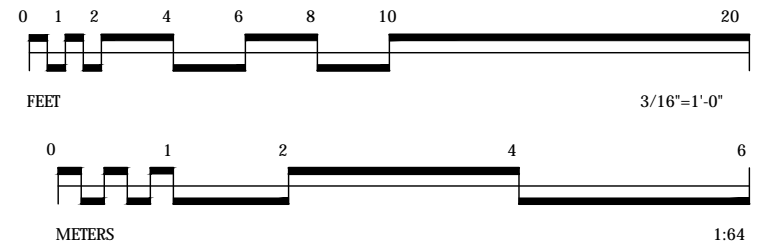
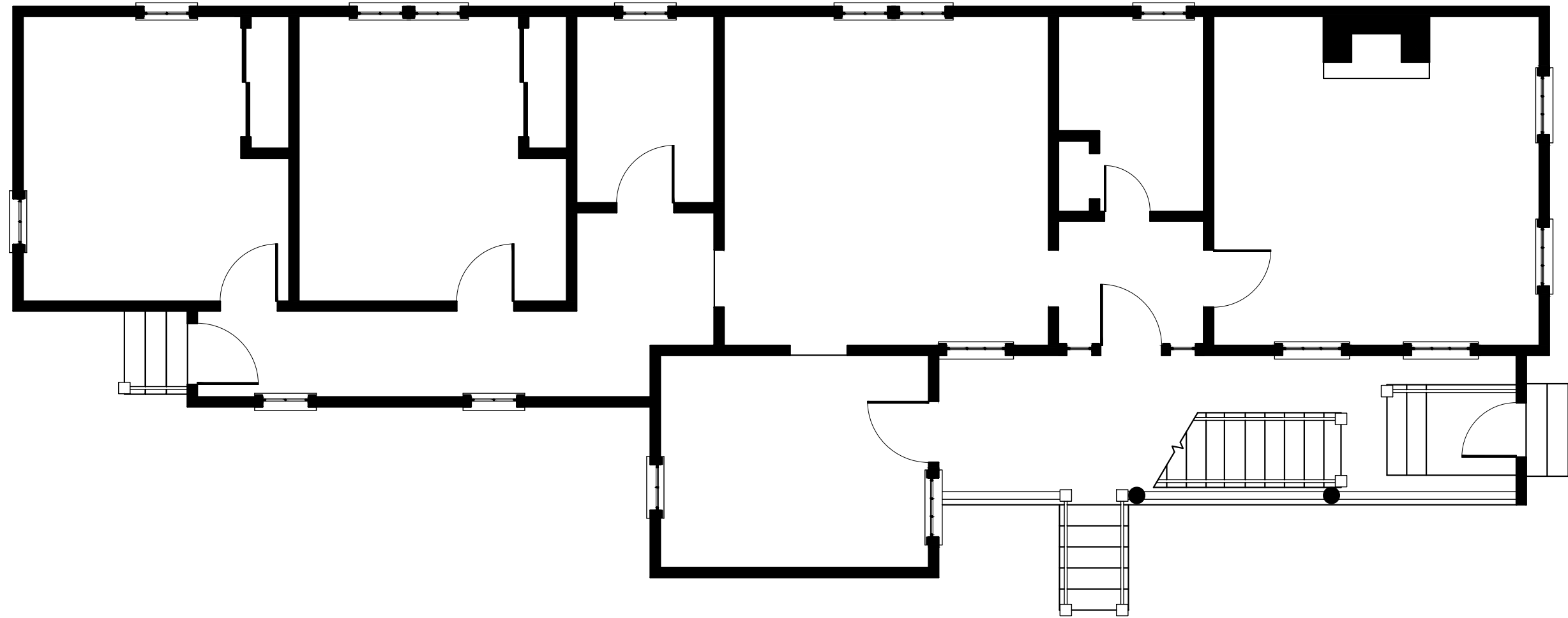


*Figure 97.* New framing beneath first level of piazza.

## APPENDIX B: DOCUMENTATION DRAWINGS

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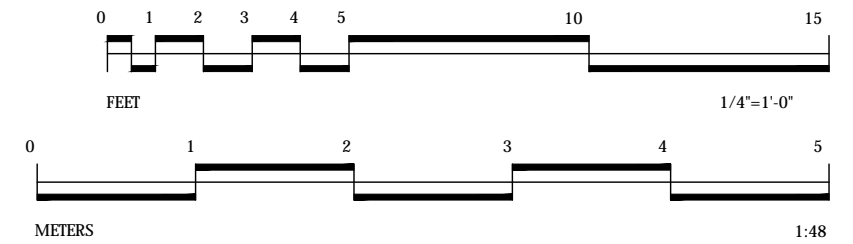


DRAWN BY: AMANDA BROWN  
DATE: APRIL 26, 2016

# FIRST FLOOR PLAN

36 REID STREET, CHARLESTON, SOUTH CAROLINA

SCALE: 3/16" = 1'-0"  
SHEET 1 OF 2 SHEETS



DRAWN BY: AMANDA BROWN  
DATE: APRIL 26, 2016

# **SOUTH EXTERIOR ELEVATION** 36 REID STREET, CHARLESTON, SOUTH CAROLINA

SCALE: 1/4" = 1'-0"  
SHEET 2 OF 2 SHEETS