

March 10, 2017

Mr. Richard J. Gowe, AIA, LEED AP
Vice President - Principal
LS3P Associates, LTD
205 ½ King Street
Charleston, SC 29401

Subject: 573 Meeting Street Structural Evaluation

Dear Mr. Gowe:

Collins Engineers, Inc. (Collins) was engaged by LS3P Associates, Ltd. (LS3P) to perform a structural assessment of the existing building at the 573 Meeting Street facility in downtown Charleston, SC.

Collins performed a visual evaluation of the existing structure on February 24, 2017. The assessment was purely visual in nature; no material sampling or destructive testing was performed. The assessment was performed by a licensed Professional Engineer registered in the State of South Carolina.

A cursory visual review of the exterior and interior of the building was conducted. The purpose of the evaluation was to assess the building's structural condition and better understand the construction of the building. An environmental assessment of the building was not conducted, though testing for lead paint and asbestos is recommended, given the age and construction type of some of the building.

The foundation of the building was inaccessible and was not reviewed by Collins.

Executive Summary

The 573 Meeting Street facility appears to have been modified significantly since its original construction; these modifications have impacted both the interior and exterior portions of the building, including the structure, building envelope, and appearance of the building. The original building exhibits signs of deterioration and significant previous structural distress while the newer addition also exhibits signs of significant deterioration and has been partially demolished.

Significant repairs are required at the original building prior to future occupancy. Maintenance is required at the exterior front wall façade of the original building to reinstate a water-tight envelope and repair deteriorated mortar and masonry. The exterior wall at the east elevation appears to be bowed outward above the steel lintel above the openings. Collins recommends that the existing brick veneer and steel lintel impacted by the bowing should be removed and replaced with new masonry, with supplemental framing added to provide proper support. The load bearing brick wall on the north elevation of the building is shared with the adjacent building, this interface should be evaluated for compliance with fire separation requirements. Environmental concerns such as lead paint, mold, and the potential for asbestos containing material should also be addressed prior to future occupancy. Continued deterioration will occur if the building is not repaired.

Site and Building Description

The 573 Meeting Street facility consists of the original one-story building that appears to have been constructed in 1946-47 and two-story addition that was constructed in 1987. The building was constructed with a flat modified bitumen roof. Please see Figure 1 and Figure 2 below for an overall first floor plan and overall second floor plan respectively. Refer to Figure 3 below for an observed framing plan of the roof structure.

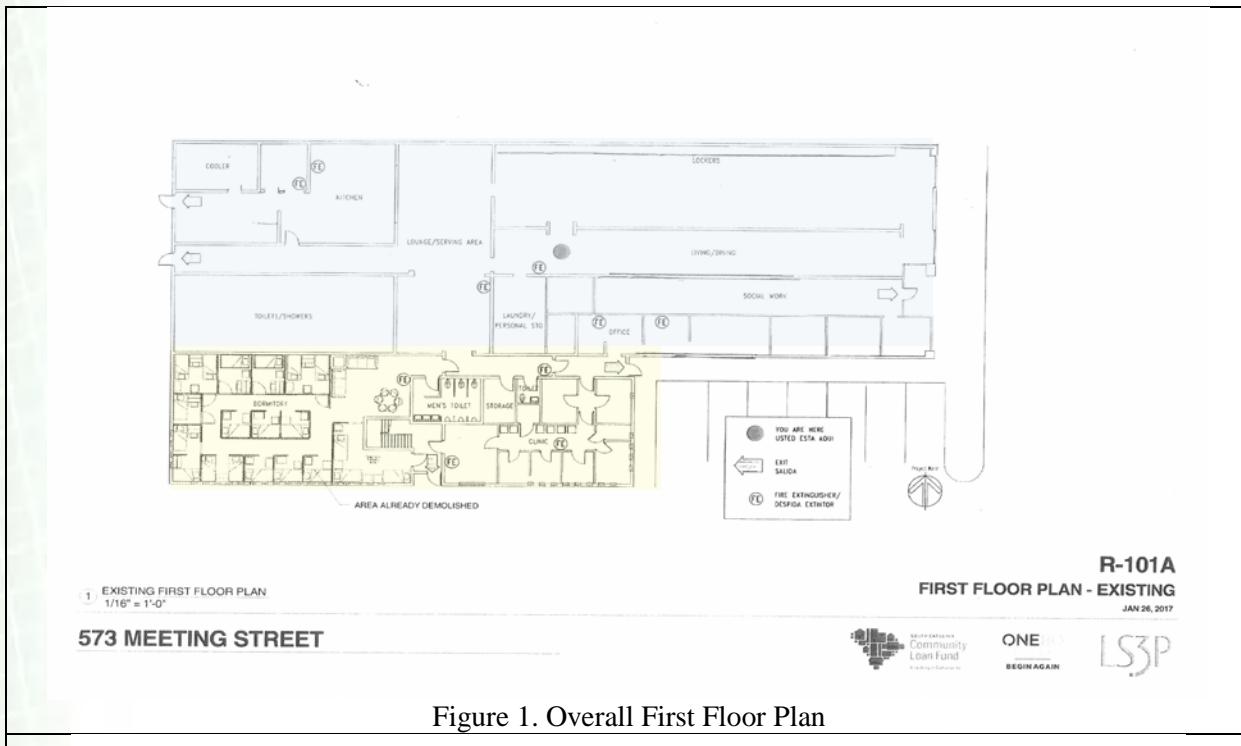


Figure 1. Overall First Floor Plan

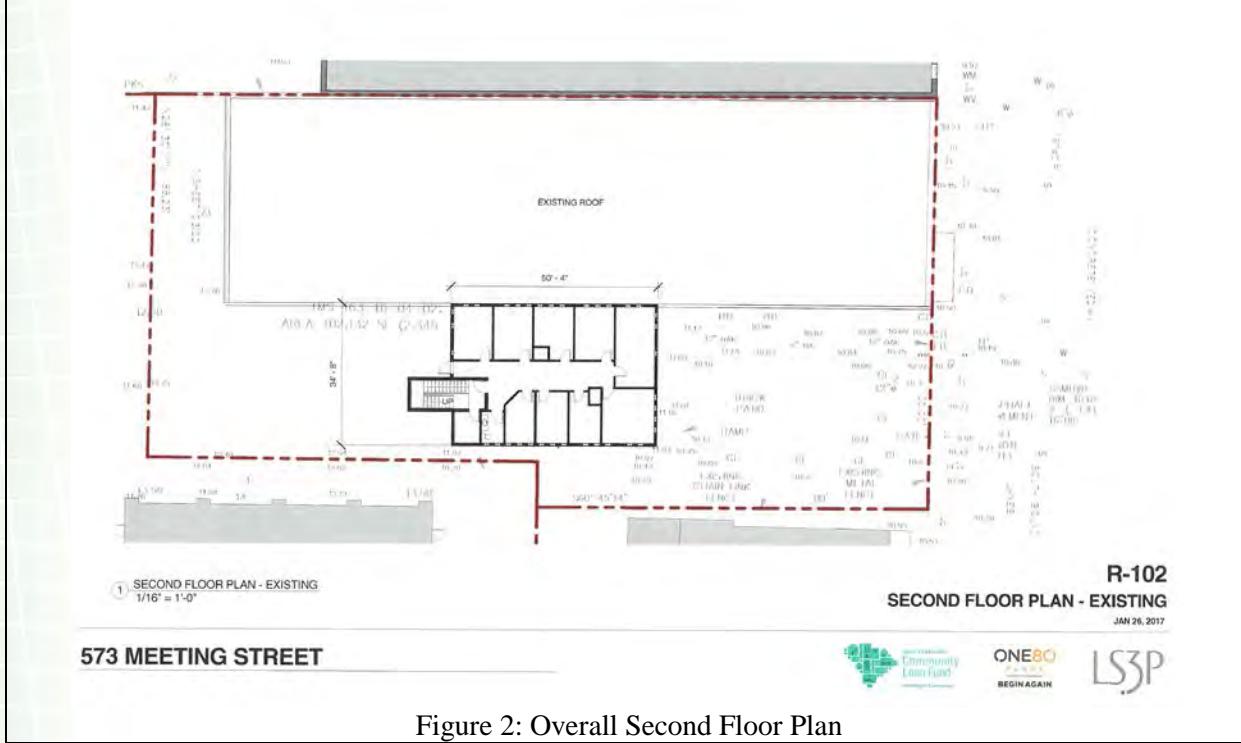
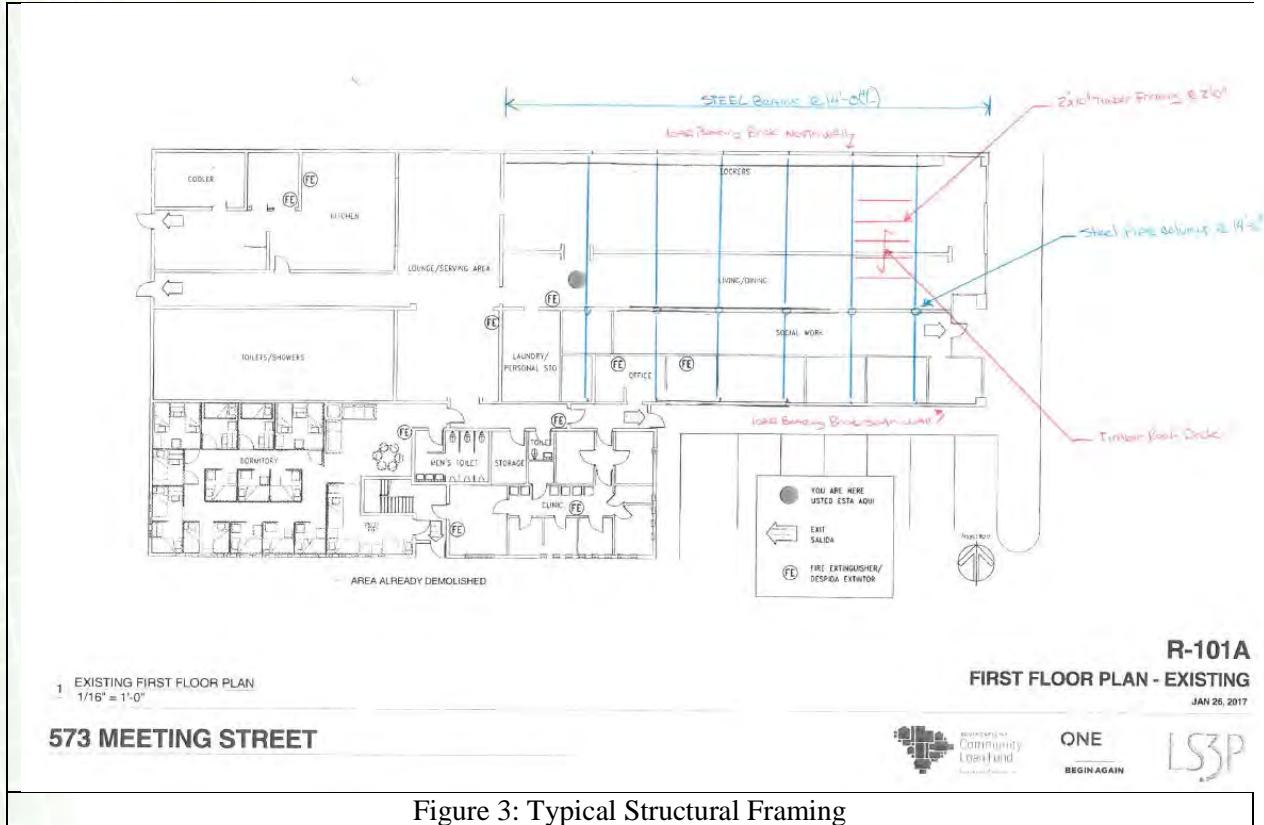


Figure 2: Overall Second Floor Plan



Original Building

The original building is a one-story building constructed with exterior load bearing brick masonry walls and interior steel columns and beams that support a timber framed roof structure. The building has an overall footprint of approximately 172-ft in the east-west direction by 51-ft in the north-south direction. The roof framing was constructed with 2X10 timber joists spaced at approximately 24-in. on-center that span in the east-west direction between structural steel beams that span in the north-south direction and are spaced at approximately 14 feet on-center. The structural steel beams span between the perimeter load bearing masonry wall and a series of steel pipe columns that are enclosed in an interior drywall partition wall. The north load bearing brick wall is shared by the adjacent property and appears to support the structure of each building. The timber 2x 10 joists support a timber roof deck with a modified bituminous roof. A brick veneer with a parapet was constructed at the front entrance along Meeting Street. The brick veneer is supported by a steel lintel member that spans between concrete masonry unit (CMU) piers at each end and at intermediate locations. A corridor that serves as the main entrance to the building connects the original building and the addition. Refer to Photos 1 through 13 for overall views of the building and its typical framing.



Photo 1: Overall view of east elevation of original building



Photo 2: View of south elevation of original building



Photo 3: Glass block window infill to south wall



Photo 5: Typical roof framing at original building

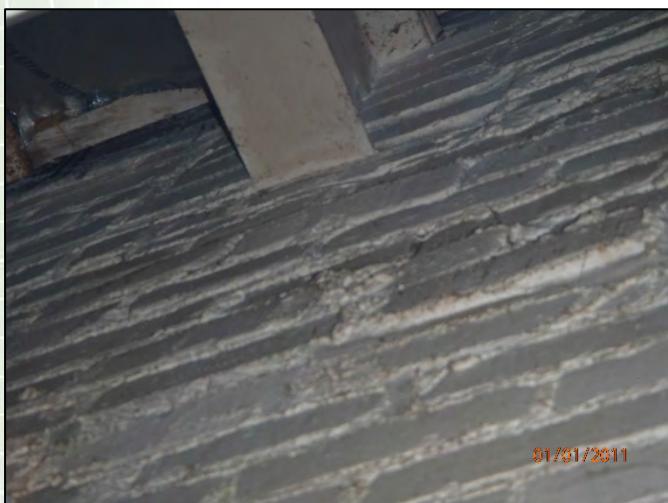


Photo 7: Steel beam bearing in beam pocket at north wall



Photo 4: Overall view of interior of original building



Photo 6: Steel column and beam that support roof



Photo 8: Steel beam bearing at north wall



Photo 9: View of north wall brick masonry



Photo 10: Typical view of interior north wall



Photo 11: View of roof and east parapet



Photo 12: Construction of north wall of 575 Meeting St building



Photo 13: Typical view of modified bituminous roof at original building



Photo 14: Broken brick in façade

Addition

The addition is a two-story building with an overall footprint of approximately 53-ft in the east-west direction by 34-ft in the north-south direction. The building was constructed with structural steel open web joists, structural steel beams and load bearing CMU walls. The addition has been partially demolished. The addition was constructed on the south-west portion of the property and was constructed circa 1980's. The building exterior is painted CMU. Refer to Photos 14 through 20 for overall views of the building and its typical framing.



Photo 15: East elevation of addition



Photo 16: Previously demolished portion of addition



Photo 17: West elevation of addition



Photo 18: Typical view of interior of addition



Photo 19: Interior view of west elevation of addition



Photo 20: Underside of roof of addition



Photo 21: Typical view of interior of addition



Photo 22: View of CMU wall East wall of addition



Photo 23: Cracking in CMU east all of addition



Photo 24: East wall of addition with visible cracking

Observations

Collins performed a visual evaluation of the existing structures on February 24, 2017. The assessment was purely visual in nature; no material sampling or destructive testing was performed. The assessment was performed by a licensed Professional Engineer registered in the State of South Carolina.

The following summarizes Collins' observations of each building:

Original Building

- The load bearing masonry wall at the north end facility is shared with the adjacent 575 Meeting Street. (Photo 25 and 26). The property line is at the middle of the 18 inch thick wall.
- Displaced brick was observed along the east (Meeting Street) façade. The displacement of the brick from the CMU wall increases in magnitude from the foundation to the brick shelf angle. (Photo 27 and 28)
- The brick façade at the east elevation is out of plumb. (Photos 29 and 30)
- A large portion of the CMU support at the north-east corner of the building was removed for placement of gas lines and a fire department connection. (Photos 31, 32 and 33)
- Step cracking was observed at the steel lintel bearing point. (Photo 34)
- Cracks were observed in the brick façade above the lintel at the east elevation. (Photos 35 and 36)
- Corrosion was observed on the steel lintel at the exterior face of the building (Photo 37 and 38)
- Cracks were observed in the stucco near the foundation along the Meeting Street façade. (Photo 39 and 40)
- Water intrusion was observed at the south-east end of the front façade as exhibited by damaged timber framing and roof decking. (photo 41)
- The north end of the Meeting Street façade is displaced inward with respect to the adjacent building. (photo 42)
- The roof structure at the north-west corner of the building is collapsing (photo 43 and 44)



Photo 25: Steel beam bearing on shared north wall



Photo 26: Steel beam bearing on shared north wall



Photo 27: Displaced brick at west façade at foundation



Photo 28: Displaced brick at west façade at roof



Photo 29: East wall out of plumb



Photo 30: East wall out of plumb



Photo 31: Penetrations at CMU bearing point in East wall



Photo 32: Close up view of penetration at east CMU wall bearing point



Photo 33: Pipe penetration through CMU at lintel bearing above



Photo 34: Water intrusion damage at East face wall

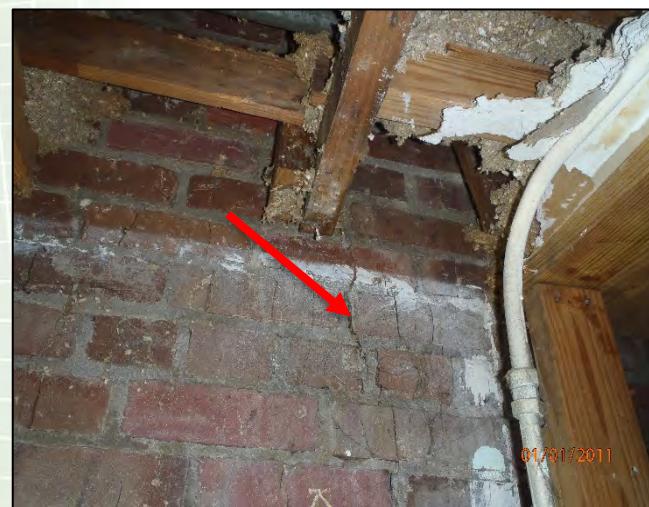


Photo 35: Crack in brick façade at east elevation



Photo 36: Cracks in brick façade at east elevation



Photo 37: Corrosion of steel lintel at east wall



Photo 38 Corrosion of steel lintel at east wall



Photo 39: Cracks in stucco veneer at east wall



Photo 40: Cracks in stucco veneer near East wall foundation



Photo 41: Water intrusion damage near east wall

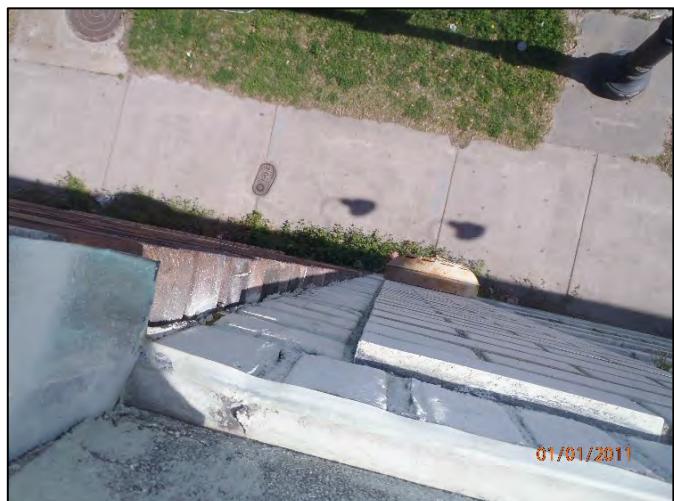


Photo 42: Brick façade bowing inward at top of parapet



Photo 43: Collapsed north-west corner of roof



Photo 44: Collapsed north-west corner of roof



Photo 45: Visible crack in foundation wall



Photo 46: Infill of south wall

Addition

- The south-west portion of the building has been partially demolished. (Photos 47 and 48)
- Evidence of water infiltration was observed at the exterior windows. (Photo 51)



Photo 47: Partial demolition of portion of addition



Photo 48: Partial demolition of portion of addition



Photo 49: Visible crack in CMU west wall



Photo 50: Roof collapsing in northeast corner



Photo 51: Water staining and corrosion at windows at west elevation of addition.

Evaluation, Recommendations, and Conclusion

The 573 Meeting Street facility appears to have been modified by additions, demolition and remodeling by its various owners since its original construction; these modifications have impacted both the interior and exterior portions of the buildings on the facility, including the structure, building envelope, and appearance of the buildings. The original building exhibits signs of deterioration and significant previous structural distress while the addition also exhibit similar signs of significant deterioration and has been partially demolished.

Significant repairs are required at the original building prior to future occupancy. Maintenance is required at the exterior front wall façade of the original building to reinstate a water-tight envelope and repair deteriorated mortar and masonry. The exterior wall at the east elevation appears to be bowed outward above the steel lintel above the openings. Collins recommends that the existing brick veneer and steel lintel impacted by the bowing should be removed and replaced with new masonry, with supplemental framing added to provide proper support. In addition the CMU load bearing wall on the east elevation that support the brick façade should be replaced due to the large pipe openings beneath the bearing point of the lintels and the bowing out of plumb alignment.

The load bearing brick wall on the north elevation of the building is shared with the adjacent building, this interface should be evaluated for compliance with fire separation requirements. In addition, the removal of mass loading the wall on one side would increase the wall capacity to resist a seismic event and maintain the integrity of the adjacent structure. Lastly, the removal of the roof structure at 573 Meeting Street would allow greater flexibility to repair and renovate the building at 575 meeting street by the removal of the connection and shared loading between the two buildings. In its present condition the load from both buildings would need to be addressed before any repairs or modifications to the wall are considered.

Another concern is the sharing of the north load bearing brick masonry wall with the 575 Meeting Street building. If the structural framing of the 573 Meeting Street building is removed from the shared wall, the stress on the wall would decrease and potential fire separation issues would be remediated. The removal of the framing would require the wall to be braced for stability and the roof structure to be shored prior to removal. The roof deck and joists would then be removed. The structural steel beams would be removed and the brick beam pockets could then be filled in with the proper materials.

Environmental concerns such as lead paint, mold, and the potential for asbestos containing material should also be addressed prior to future occupancy. Continued deterioration will occur if the building is not repaired.

Please feel free to contact us should you have any additional questions regarding our assessment.

Very truly yours,

COLLINS ENGINEERS, INC.

Christopher E. Reddick

Christopher Reddick, PE