CONDITIONS ASSESSMENT

70 MULBERRY STREET
NEW YORK, NY

Prepared for:
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I. INTRODUCTION

Jablonski Building Conservation, Inc. (JBC) working with Ronnette Riley Architect performed a façade conditions assessment of the remaining façades of 70 Mulberry Street New York, NY. The assessment included both the Mulberry and Bayard Street facades. The purpose of this investigation was to document the existing conditions of the façade and provide repair recommendations.

Methodology

The exterior façade and interior first story of 70 Mulberry Street was inspected by architectural conservators Mary Jablonski and Brian Sosebee on February 12, 2021. A further inspection of the exterior façade, interior stair tower, interior first story, and basement was conducted by conservators Brian Sosebee Danielle Pape, Ryan Zeek, Tania Alam on February 22, 2021. An inspection of the second-story exterior and the exterior of the stair tower was conducted from an articulating boom lift by conservator Brian Sosebee and visually from the ground and fire-escape by Mary Jablonski on March 11th, 2021. Yumi Moriwaki from Ronnette Riley Architect also conducted visual inspections and photo documentation on February 12, February 22, and March 11, 2021. The assessments included photo documentation and graphics to record the as-found conditions. Digital photographs, taken to record conditions, are included in this report. Conditions were marked on digital photographs and on archival architectural drawings which were found at the Municipal Archives are included in Appendix A at the end of this report. Based on the findings of the conditions assessment, repair recommendations have been made.

Brief History and Building Description

70 Mulberry Street was a five-story building on the corner of Mulberry and Bayard Streets in Chinatown, New York, NY. It was originally built in 1893 as Public School 23 by school superintendent and architect C.B.J. Snyder. It is a fortress-like Romanesque and Renaissance Revival brick school on rusticated brownstone ashlar base. The building is located within Chinatown and Little Italy Historic District in New York, New York, which was listed in the National Register of Historic Places on February 12, 2010.[1]

The building has a pressed brick masonry facade with a brownstone base. A stair tower at the corner connects the southern and western elevations of the facade. Each elevation has a brownstone entry at the stair tower, which is formed with multiple engaged columns with ornate capitals and a decorative banded archway (archivolt). The interior second floor of the building is supported by a series of cast iron columns, wood joist, and steel girders. The first floor features wood flooring supported by a tile-arch system, which consists of hollow clay tiles arranged to form a flat arch between the steel support beams.

On January 23, 2020, a fire broke out in the building. The fire reportedly started on the fifth floor of the building. After the fire, the third, fourth, and fifth stories were removed leaving the brownstone base, the brick second story, and the majority of the brick stair tower (Figure 1 and

[1] https://www.nps.gov/nr/feature/asia/2010/chinatown_little_italy_hd.htm

2).[2] A temporary roof was installed in the fall of 2020 to mitigate water infiltration into the walls and building. Prior to the fire event and demolition, some alterations had occurred over the years, which include the removal of the top portion of its central tower element, cornice, and dormer windows at the roofline, and the construction of an additional story (Figure 3).[3]

Figure 1: 70 Mulberry Street prior to fire.

Figure 2: 70 Mulberry Street after fire and demolition.

[2] https://forgotten-ny.com/2013/09/elizabeth-street-chinatown%E2%80%93soho/02-bayard-70-mulberry/
[3] https://www1.nyc.gov/html/mancb3/downloads/minutes/minutes2020-05.pdf

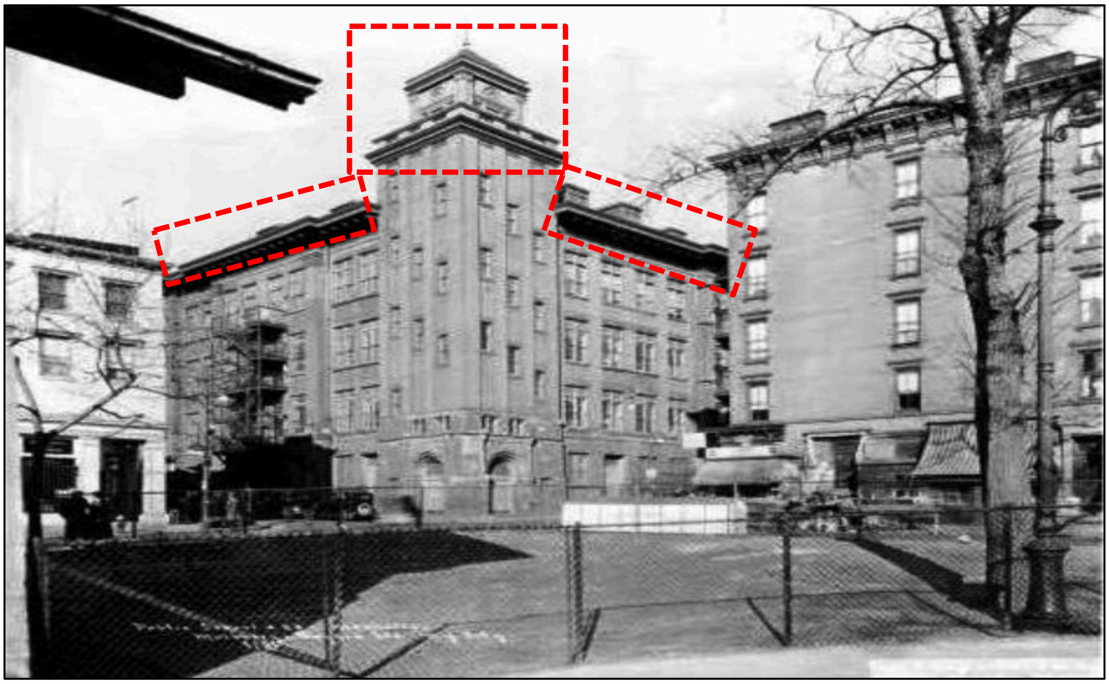


Figure 3: 70 Mulberry Street prior to alterations, the removal of its central tower element, cornice, and dormer windows at the roofline, and the construction of an additional story. The areas removed are highlighted within dotted lines.

Public School 23 at 70 Mulberry Street was the first school designed by superintendent and architect C.B.J. Snyder. He is recognized as an innovator in school design and his historical-based design represents the increasing importance of aesthetics in schools. This school was built in response to the booming immigrant population and educational mandates of the time and was originally designed to serve as an elementary school through grade 8.[4]

In 1915 PS 23 was designated "The Columbus School," in recognition of the then-predominantly Italian-American population it served. By the 1930s, increased immigration from China was reflected in the student body. In the late 1940s, the school also served as a venue for adult-education programs designed to assist the many newcomers to the city.

In June 1976, the building was de-commissioned as a school. The city maintained ownership and the building became the home for several community groups including the Chinatown Manpower Project, which offers vocational training, employment services and educational programs; H.T. Chen and Dancers, a modern dance company; and the Chinese American Planning Council. It previously housed the Museum of Chinese in America until its relocation and continued to maintain collections and research materials from the Museum of Chinese in America.[5] After the fire, the New York City Department of Building (DOB) issued a vacate order for the building. The community groups housed in the building are currently displaced.

[4] https://nylandmarks.org/explore-ny/c-b-j-snyder-public-schools/
[5] https://www.archives.nyc/blog/2020/2/13/the-heart-of-chinatown-70-mulberry-street

II. DESCRIPTION OF MATERIALS

Brownstone

Brownstone is used on the exterior of the first story of the building.

Brownstone is a sandstone composed principally of the mineral feldspar with secondary constituents consisting of quartz and mica. Individual sand grains are cemented together by the mineral albite and, in some cases, calcite, clays, and silica. The distinctive reddish-brown color of brownstone is due to the presence of hematite, a mineral form of iron oxide. Freshly quarried stone tends to be yellow-brown due to the presence of a hydrated form of iron oxide known as limonite. Exposure of the quarried rock to the air results in dehydration and conversion of limonite (FeO[OH]) to hematite (Fe_2O_3).

While brownstone was used as a building material as early as the seventeenth century, it saw widespread use from the mid-1800s until the early 1900s. Its popularity was due in part to its rich, earth-toned color, availability, and softness allowing it to be easily carved into architectural ornaments.

Despite its prominence as a building material, brownstone is inherently susceptible to deterioration. Like other sandstones, brownstone is composed in layers (or “beds”) of sedimentary material deposited thousands of years ago. In buildings, the stone was commonly face-bedded, i.e. the stone was installed so that the bedding planes are vertically oriented and parallel to the wall. This ensured a uniform color and texture across the face of the stone block. Unfortunately, this left the stone susceptible to delamination and exfoliation where individual layers of the material separate and flake off in sheets. This condition is common, occurring as soon as a decade or two after construction, and is initiated by hygric dilatation of clays within the layers and pressures exerted by freezing moisture expanding within the pores of the material. The high porosity of the stone also makes it vulnerable to attack by recrystallization of water-soluble salts.

The brownstone used at 70 Mulberry Street is in good condition except for a few individual units, with minor delamination, cracks, and failed patches. The brownstone is face-bedded with its natural bedding planes oriented vertically.

Pressed Brick

Pressed brick, laid in a stretcher bond, is used on the exterior of the building above the first-floor brownstone, and on the interior of the first floor and stair tower.

Pressed brick is also known as face brick, or Philadelphia Pressed Brick. It was made of very fine, dry clay pressed into molds under great pressure by hydraulic or screw presses. The brick was fired in a kiln almost immediately without an intermediate drying phase with minimal shrinkage. They were dense and hard compared to common brick. Pressed brick is very even with sharp edges and smooth surfaces that allowed for the use of fine mortar joints, known as butter joints. These bricks, manufactured in a few major centers, were harder and more uniform in size and color than common brick. Pressed brick was more expensive than common brick and was consequently installed as a veneer over a common backup brick, as it was at this building.

The pressed brick units are in good condition and the exterior brickwork is in good to fair condition with some missing and unstable areas adjacent to the fire and subsequent demolition.

Cast Iron

Cast iron is used for the (8) 10" diameter, 1-1/2" thick columns at each floor, which support the interior floors of the building.

Cast iron is an alloy of carbon and iron, containing 2-4% carbon by weight. Molten cast iron is very fluid and can easily be poured into a variety of forms. It is very hard and has excellent compressive strength but performs poorly in tension. Cast iron has more carbon content than wrought iron and steel, it tends to be more resistant to corrosion than the other iron metals. However, because of these flakes of carbon that cast iron absorbs during production it is very brittle. Cast iron that is not properly maintained and routinely painted starts to oxidize, or rust.

Cast iron is produced by pouring molten metal into the void of a mold which creates a casting. Molds were traditionally made from a damp sand and clay mixture called "green sand" which is still in use today. Once the metal has cooled, the castings are broken out of the molds and any mold lines or "flashes" are dressed off and the castings are brushed clean.

Cast iron deteriorates when it is exposed to air and moisture. The oxidation process, or rusting, involves a chemical reaction in which oxygen combines with the iron to form ferric oxides. The oxidation process is an expansive one and approximately 1/8 inch of iron once completely oxidized is equal to 1 inch of rust. This expansion can cause cracks stress, displacement of surrounding masonry and is sometimes referred to as rust jacking. Corrosion also results in loss of material, which can compromise the structural integrity of the iron. Often times, small areas of the cast iron start to rust, including ornamental details that have crevices that can trap and hold water. Once a small area of the cast iron starts to oxidize, corrosion is accelerated and spread by the fact that the oxidized surface is porous and holds onto the water or liquids.

The remaining cast iron columns at the first floor and basement are in good condition with minor corrosion, peeling paint, and open seams.

Wrought Iron[6]

Wrought iron is used for the decorative elements of the railing in the stair tower.

Wrought iron is commercial iron consisting of slag (iron silicate) fibers entrained in an iron matrix. It is almost pure iron with less than 1% carbon. Slag content varies between 1 and 4%. The slag exists in a purely physical association and not alloyed, which gives wrought iron its characteristic laminated structure.

Wrought iron is relatively soft, malleable, tough, fatigue-resistant, and easily worked by forging, bending, rolling, and drawing. It can be reheated and hot-worked again and again to the desired shape. The more wrought iron is worked the stronger it becomes. It is also easily welded. It has a high elasticity and tensile strength.

Until the mid-19th century, wrought iron was generally used for tie rods, straps, nails, hardware, railings, and fences. Before steel was available, wrought iron was used structurally for beams and girders in both tension and compression. During the late 19th and early 20th centuries, it was not uncommon to find a mixture of cast-iron column and wrought or steel beams in the same building.

Iron, when unprotected, oxidizes rapidly when exposed to moisture. Wrought iron generally rusts more quickly than cast iron, however the corrosion can be more readily measured, and the degree of deterioration ascertained. However, wrought iron is resistant to progressive corrosion due to the slag content which acts as a barrier to corrosion.

The wrought iron in the stair tower is in good condition.

[6] John G. Waite "Chapter 17: Iron and Iron Alloys; Preservation and Repair", *Metals in America's Historic Buildings*, (Washington, DC: US Department of the Interior, 1980), 130-131.

III. SUMMARY OF CONDITIONS

The remaining exterior walls of 70 Mulberry Street are in fair condition. After a fire event on the fifth floor, *per NYC DOB directive*, the building was partially demolished removing the top three stories from each street elevation. A temporary roof was later added over the second story to mitigate water infiltration into the building.

The brownstone façade at the first story is in good to fair condition with patch repairs, delamination, material loss/erosion, cracks, removed/existing anchors, paint splatter, salt damage, efflorescence, water damage, atmospheric soiling, and biological growth. An estimated twenty five percent of the brownstone façade has been patched and the patches are mostly in good condition.

The brick façade at the second story is in good to fair condition with areas of infill, mortar loss, masonry cracks, minor material loss, efflorescence, and atmospheric soiling. The highest concentration of damage is located behind each of the fire escapes on both elevations with significant soiling, areas of infill, loss, and damage around windows. What was accessible and visible of the stone belt course above the second story has been heavily damaged by demolition and covered by the temporary roof.

The brick stair tower is located at the corner of Mulberry and Bayard Street. Demolition of the top three stories following the fire has damaged and exposed the interior walls of the tower. There is also some fire damage to interior facing walls of the fifth level. The tower is in fair condition with areas of missing and unstable brick, infill, cracks, open joints, biological growth, efflorescence, and atmospheric soiling. The top of the tower is entirely replacement brick, most likely dating from when the upper, central portion of the tower was removed. However, the northeast corner at the top of the tower has missing and unsecured brick that may be a safety hazard and has allowed water to infiltrate the tower resulting in biological growth along the wall.

The interior of the building has suffered from fire damage, water infiltration, and demolition. The interior pressed brick on the first floor and stair tower is in good to fair condition with areas of peeling paint, demolition, and water damage. The cast iron columns are in good condition with peeling paint, minor corrosion, and missing elements. Most corrosion of columns and missing elements are found at the base. The cast and wrought iron elements in the stair are in good condition with peeling paint throughout. A majority of the undemolished interior pressed brick walls and cast iron columns are intact. There is a small area of pressed brick that has fallen from the first story into the basement through a hole in the floor during demolition and is salvageable. If the interior pressed brick is not to be used in the new design, it is also salvageable for use on the exterior.

Brownstone Façade 1st Story

The Mulberry Street and Bayard Street elevations are connected by a stair tower at the intersection. Each elevation has a similar entrance at the tower consisting of engaged columns and capitals, an archivolt, a checkerboard block spandrel, and an ornate, three-layered dentiled cornice (Figure 4).

At both entrances, the middle band in the archivolt over the door is delaminating, resulting in a loss of detail in the decorative band (Figure 5 and 6). The other bands are in good condition. The column capitals on both elevations are eroded and have lost detail (Figure 7 and 8). A singular strip of caulk and abandoned anchors in two of the stones around center height of the door are present along the innermost arch of both entrances (Figure 5 and 6). It appears that this may have been the location of previous signage.

The cornice above the Mulberry Street entrance has heavy atmospheric soiling and there are cracks in a limited number of the blocks in the spandrel below (Figure 4 and 9). Below the cornice there is an area of patched brownstone that is in good condition (Figure 10). The engaged columns that frame the Mulberry Street entry door are in good condition with delamination and spalling at the base of the south side of the entrance and some minor delamination on the north side closest to the ground (Figure 11). The cornice above the Bayard Street entrance has light atmospheric soiling. The columns are in good condition with majority of spalling and delamination at the base of both sides of the door (Figure 7).

The brownstone façade on both elevations is in good condition. Water infiltration is a source for some of the damage resulting in delamination, as well as previous repairs, atmospheric soiling, and biological growth. Possible sources for water infiltration into the brownstone could be from water entering the tops of the walls, rising damp as well as where window and door frames have been removed and replaced with plywood (Figure 13). An estimated twenty five percent of the brownstone façade has been patched and the patches are mostly in good condition.

The Mulberry Street elevation has atmospheric soiling throughout with the highest concentration at the brownstone cornice (Figure 12) and behind the fire escape stairs. The stone along the base below the water table under the windows is actively wet (Figure 13). Excess moisture in the brownstone can lead to delamination from the swelling of inherent clays and freeze-thaw deterioration in winter months. On the southern side between the main entrance and the fire escape there is delamination and material loss above a small window and both side doors as well as at the base of the side doors (Figure 14). There is material loss at the bases of the stairs for the side entrances. Behind the fire escape, there are non-matching/ failing previous repairs. On the north side of the fire escape, a side door and window have been removed and replaced with plywood, and large area of efflorescence is present above areas of high water infiltration (Figure 13). At the northwest corner above the window, there is a large area of delaminated brownstone and a non-matching previous repair (Figure 15).

The Bayard Street elevation has many of the same conditions as the Mulberry Street elevation, with atmospheric soiling throughout and water infiltration present below the water table, which is a projection of lower masonry on the outside of a wall. There is delamination below the water table under the windows between the side door and fire escape (Figure 16), on the side door staircase, behind the fire escape, and on the southeastern corner of the building. Additionally, there are some minor cracks and graffiti at this corner. There are abandoned anchor holes throughout the elevation. Behind the fire escape stairs, directly below the brick second level, there is a non-matching infill brick repair to the brownstone (Figure 17). Below and to the left the fire escape there is a large shed-like metal structure that has been covered in construction debris (Figure 18).

Figure 4: Mulberry Street entrance.

Figure 5: Spalling in decorative archivolt within dotted line and strip of caulking indicated with red arrow, Mulberry Street.

Figure 6: Spalling in decorative archivolt within dotted lines and strip of caulk indicated with red arrows, Bayard Street.

Figure 7: Bayard Street entrance loss of detail in capitals, spalling and delamination at base of engaged columns.

Figure 8: Engaged column, loss of detail, Mulberry Street entrance.

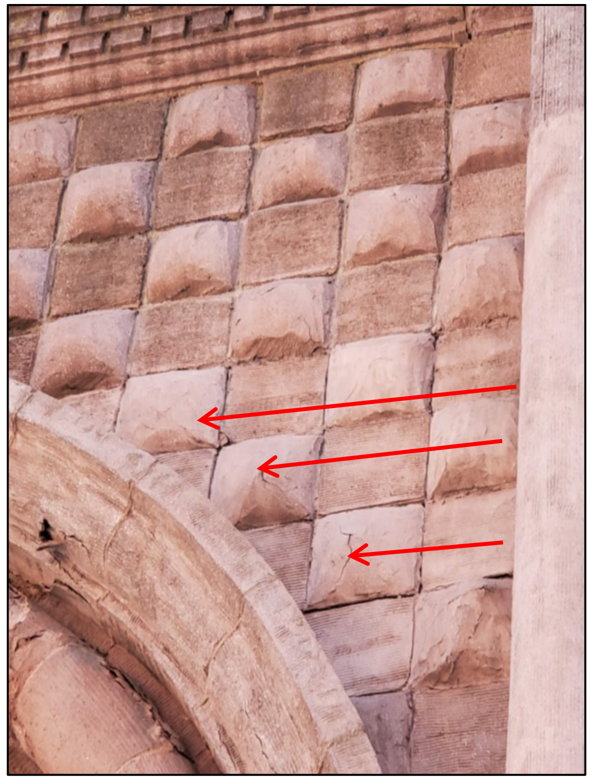


Figure 9: Cracks in blocks in spandrel indicated with arrows, Mulberry Street entrance.

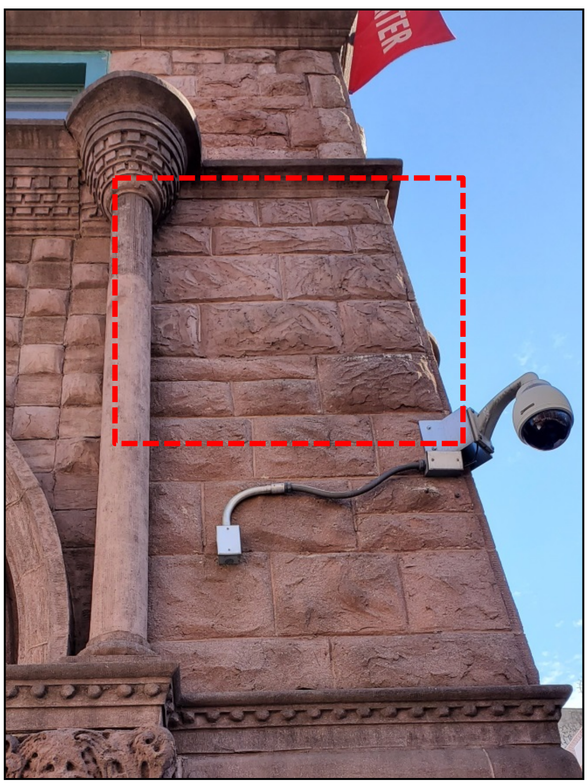


Figure 10: Brownstone patch within dotted lines in upper corner of Mulberry Street entrance.

Figure 11: Spalling and delamination at bottom of column on the south side of Mulberry Street entrance.

Figure 12: Biological growth and atmospheric soiling above side door, Mulberry Street.

Figure 13: Water infiltration and efflorescence underneath removed window, Mulberry Street.

Figure 14: Delamination at base of side door entrance, Mulberry Street.

Figure 15: Northwest corner above the window delaminated brownstone and a non-matching previous repair, Mulberry Street.

Figure 16: Delamination and water infiltration, Bayard Street.

Figure 17: Non-matching infill brick repair behind fire escape, Bayard Street.

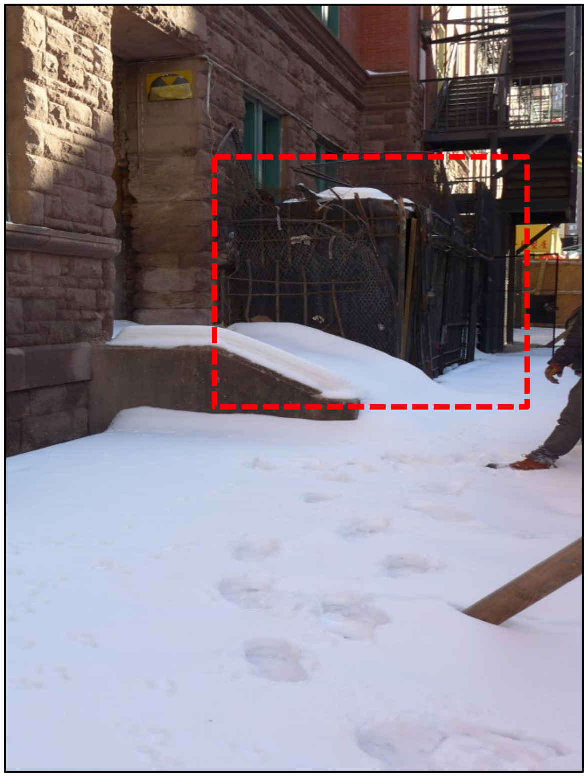


Figure 18: Large shed-like metal structure within dotted line that has been covered in construction debris, Bayard Street.

Brick Façade at 2nd Story and Stair Tower

The second story of the Mulberry Street and Bayard Street elevations is clad in pressed brick and connected at the corner by a four-story brick stair tower. The recently-installed temporary roof covers the stone belt course above the second story and a few courses of brick at the top of both elevation walls. The brick façade on the second story and the stair tower is in good condition for the most part although it is fair to poor condition at the top of the wall. The interior facing brick walls of the stair tower are in fair condition. Most of the pressed brick is intact with limited areas of infill masonry. Conditions include previous repairs, open joints, water infiltration, damage from demolition, and atmospheric soiling.

The façade bricks are pressed brick laid in a stretcher bond and are connected to the backing wall of common brick using clipped brick and blind headers (Figure 19). A header brick, laid at a sixty-degree angle, is used to tie the stretcher face to the load bearing masonry behind (Figure 20). This brick bond is not a good bond but for one story of brickwork, it is feasible to stabilize.

Bullnosed brick, or a brick with a rounded-off edge, is used around the windows on both elevations and on the edge of the brick pilasters on both elevations including those on the stair tower (Figure 21). A red tinted mortar is used with the pressed brick on both elevations and the stair tower. In areas of repair, both a red tinted mortar and a gray mortar has been used with the replacement brick.

Prior to the fire[7], the one-story, central element at the top of the stair tower and cornice were removed and altered and the top roofed over. The current top of the stair tower consists of a parapet wall with cast coping stone. From the cast coping stone down approximately twenty five courses is replacement masonry. The replacement brick does not replicate the bullnosed brick and therefore sticks out at the corners of the building and at the pilasters (Figure 22). In repair areas lower on the facades, such as at the base of the stair tower, the replacement bricks at the corners have been sanded down to mimic the bullnose (Figure 23).

The interior walls (the north and east walls) of the stair tower have been left exposed to exterior conditions due to the demolition of the top three stories of the south and west elevations. Both interior elevations exhibit damage from this demolition throughout (Figure 24). There is broken brick spanning the entire height of the tower (above the roof) along the northwestern and southwestern edges of the stair tower where the south and west walls of the building connected to the tower (Figure 25). The fifth-floor of the stair tower has evidence of soot and charred roof flashing on the brick of both interior walls (Figure 26). The damage to brick in this area is primarily due to demolition. The brick in the top northeast corner is missing and what remains is loose, which is a potential safety issue. There is currently brick and mortar debris on the temporary roof below the damaged corner. This condition has allowed for water infiltration into the tower and resulted in biological growth along the wall (Figure 27). It may also have destabilized the parapet wall of the tower.

[7] Municipal Archives drawings from 1939 show the tower being removed and other changes to the top of the building but the exact date of this alteration is unknown.

There are open joints throughout both elevations of the stair tower with significant mortar loss along the pilasters' rounded edges and in between the pilasters in the fourth level of the tower (Figure 28). There are only minor cracks on the Bayard Street elevation. The Mulberry Street elevation of the stair tower has heavy atmospheric soiling and efflorescence buildup below the stone window sills (Figure 29). Above the Bayard Street entrance, a crack along the central brick pilaster runs from just above the brownstone cornice to just below the stone sill of the window (Figure 30). Abandoned anchors and flags are currently anchored into the brick above both entrances (Figure 23).

The brick behind each of the fire escapes on both the Mulberry and Bayard Street elevations is significantly damaged as a result of the demolition. There is missing brick, displaced brick, open joints, and exposed backup brick below the temporary roof at the top of the fire escapes (Figure 31). There are areas of infill masonry at the top of both fire escapes (Figure 32).

Both 2nd story elevations have atmospheric soiling and efflorescence on the brick primarily between the temporary roof and stone lintel above the windows (Figure 33 and in some areas below the windowsills on the Mulberry Street elevation. There is damage to the temporary roof and stone belt course at the northwestern corner of the Bayard Street elevation, below which there is significant atmospheric soiling and efflorescence (Figure 34). On both elevations there is either infill masonry, damaged masonry, or missing masonry at the bottom corner of most of the windows (Figure 35). The window closest to the stair tower on the Bayard Street elevation has infill masonry and is missing bricks above the window (Figure 36).

Figure 19: Looking down from above Pressed Brick in a stretcher bond with clipped brick bond to back-up masonry wall, Bayard Street.

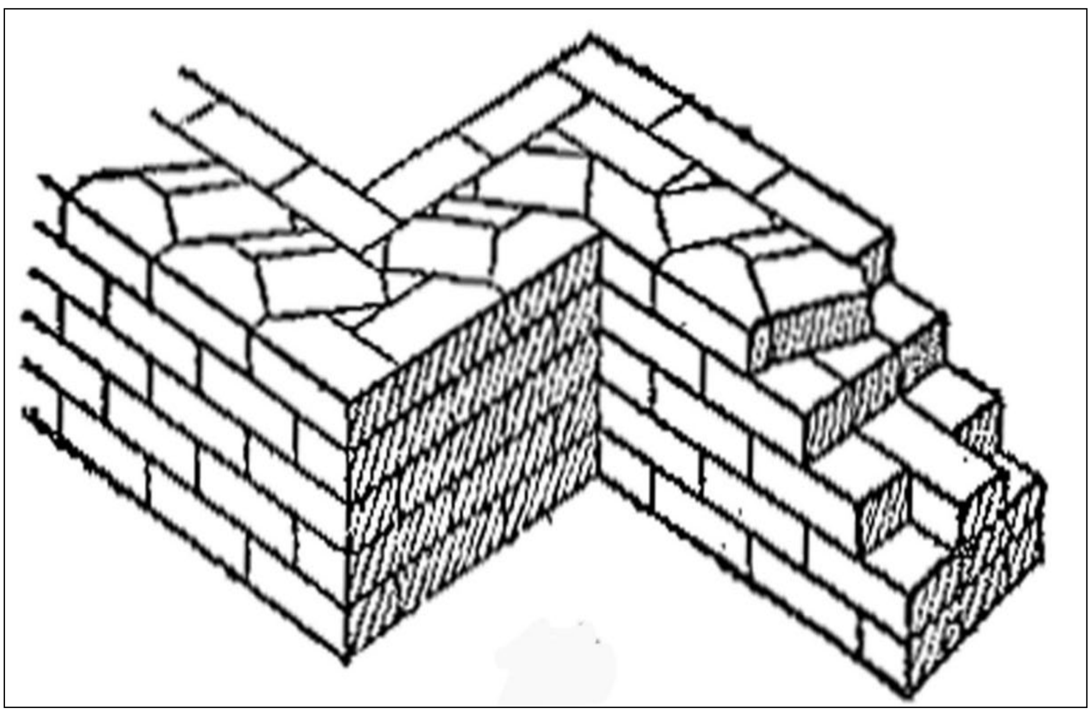


Figure 20: Illustration of wall laid in a stretcher bond. Blind headers are created by laying a header brick on an angle to tie the face of the wall to the back-up brick behind.

Figure 21: Displaced bullnose brick at fire escape, Mulberry Street.

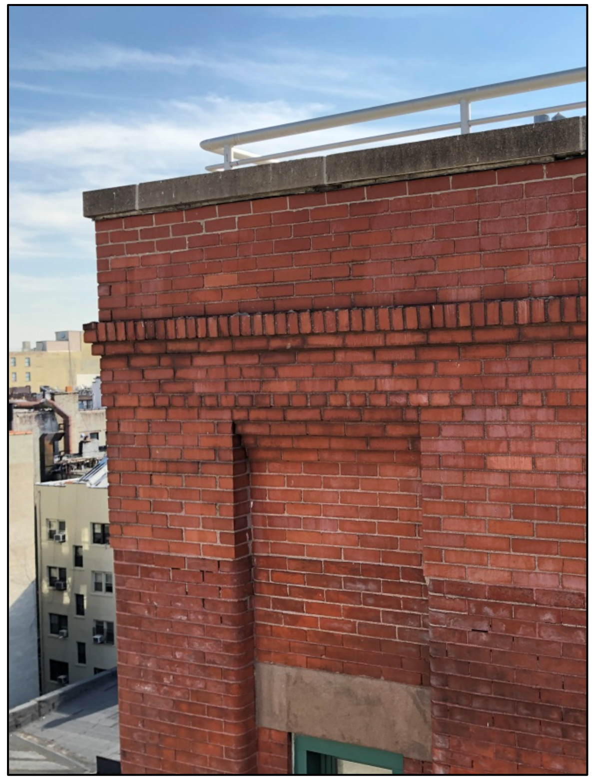


Figure 22: Replacement masonry at top of stair tower, Mulberry Street. Note the gray pointing mortar.

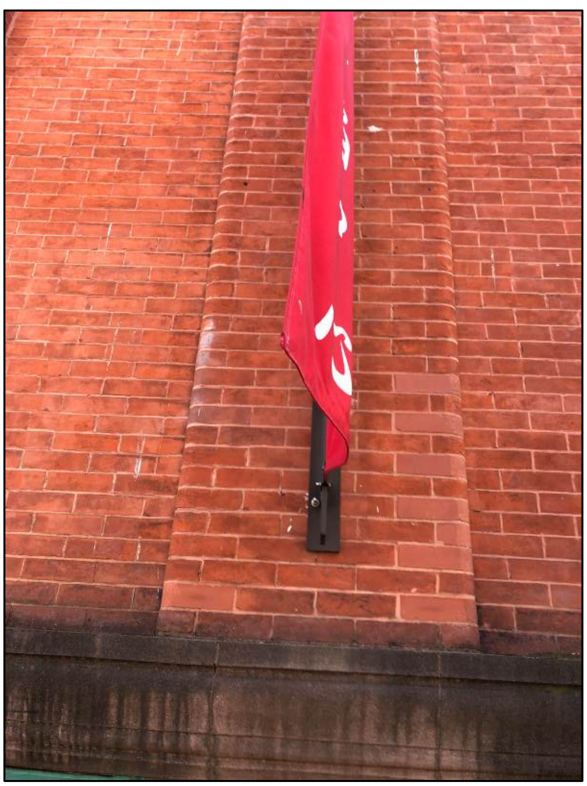


Figure 23: Replacement bricks sanded down to rounded edge, anchored flag and abandoned anchors, Mulberry Street.

Figure 24: Interior exposed walls of stair tower.

Figure 25: Demolition on corner of stair tower, Bayard Street.

Figure 26: Fire and demolition damage, Bayard Street.

Figure 27: Northeast interior corner with brick loss damage and biological growth.

Figure 28: Open joints stair tower pilaster, Mulberry Street.

Figure 29: Atmospheric soiling and efflorescence buildup below the stone window sill stair tower, Mulberry Street.

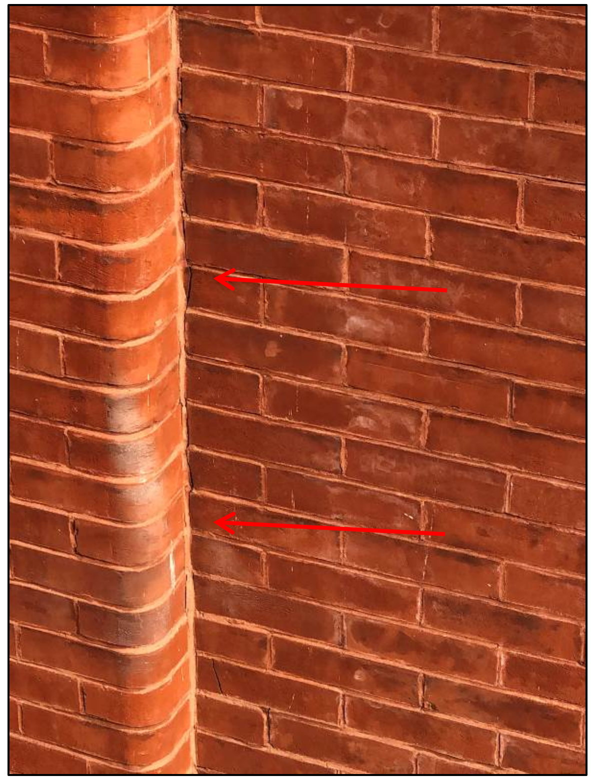


Figure 30: Crack along pilaster in masonry indicated with arrows, Bayard Street.

Figure 31: Masonry damage due to demolition, top of fire escape stairs, Mulberry Street.

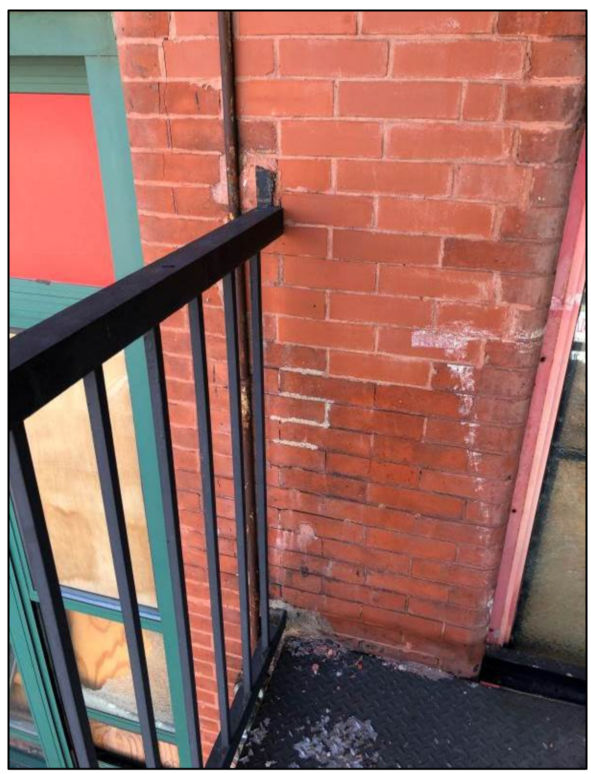


Figure 32: Infill masonry at top of fire escape stairs, Bayard Street.

Figure 33: Atmospheric soiling and efflorescence, Bayard Street.

Figure 34: Damage and efflorescence, at the corner of Bayard Street.

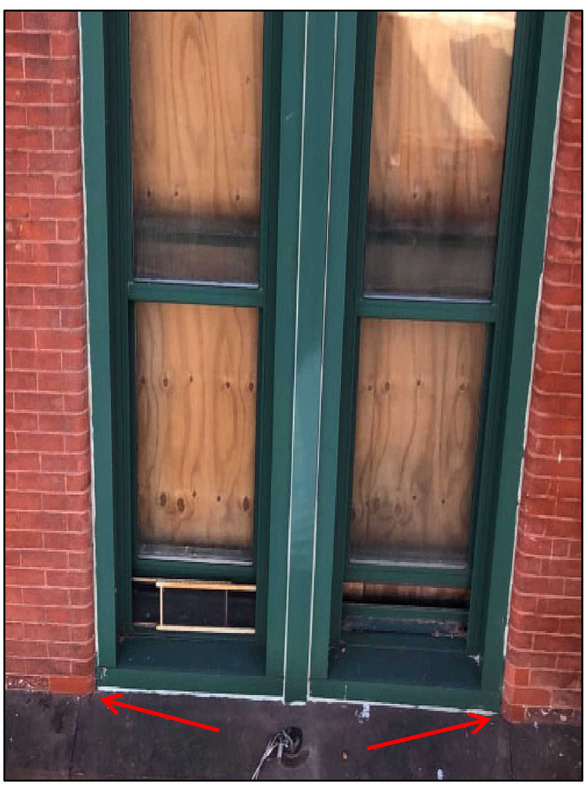


Figure 35: Replaced bricks indicated with arrows at the bottom corners of window, Mulberry Street.

Figure 36: Infill, damaged, and missing masonry indicated with arrows, Bayard Street.

First Story Interior, Basement, and Stair Tower

The central space in the first level of the interior is a large room with wood flooring, pressed brick walls, and eight cast iron support columns. The entirety of the interior exhibits damage from fire, water infiltration, mold, and demolition but the remaining masonry walls and cast iron columns are in fair to good condition.

The cast iron columns, consisting of a shaft, base, and capital, are arranged in two rows of four in the middle of the central space. All eight cast iron columns are corroded with peeling paint (Figure 37). Heavy corrosion is present at the base of all columns (Figure 38). Two columns are missing bases (Figure 39). Three columns have open seams and minor separation at the base (Figure 40). In the basement, there are cast iron support columns directly below the first-story columns. The columns have many of the same conditions as the first level of rust staining and missing elements.

The pressed brick walls of the central space on the first story have been painted several times and have areas of peeling paint throughout, damage due to demolition, mold, and water damage (Figure 41). The brick has a red tinted mortar that can be observed under areas of peeling paint (Figure 42). The west elevation wall of the central room is the most significantly demolished with areas exposing the backup masonry wall (Figure 43). While, pressed brick was not used in the basement level, there are demolished pressed brick that have fallen into the basement level and may be salvaged for reuse (Figure 44). The basement has water infiltration and mold throughout.

The interior of stair tower consists of five stories of painted pressed brick walls, painted metal stairs, and a wrought iron railing. The brick has been painted several times and have areas of peeling paint. The fifth floor has the largest area of peeling paint due to the fire event (Figure 45). There are some areas of peeling paint and efflorescence on the fifth floor near the ceiling (Figure 46) and mold on the second floor. The stairs have been painted both on top and underneath and have peeling paint throughout. The risers of the stairs exhibit areas of mold (Figure 47). The wrought iron railing is ornate with a metal mid-rail and hand rail. The railing is painted and in good condition with minor areas of peeling paint (Figure 48).

A majority of the undemolished interior brick and cast iron columns are intact and salvageable.


Figure 37: Cast Iron columns.


Figure 38: Corrosion at cast iron column base.


Figure 39: Missing cast iron column base.

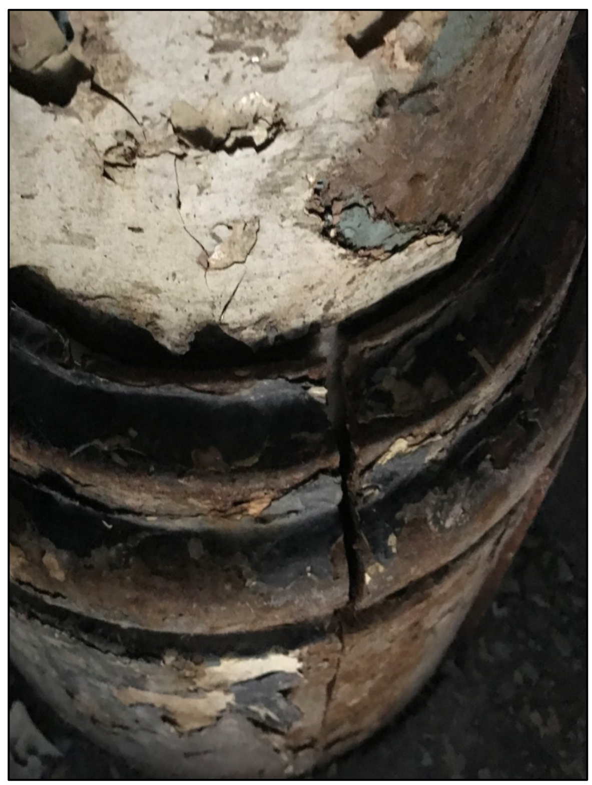


Figure 40: Open seams in cast iron column base.

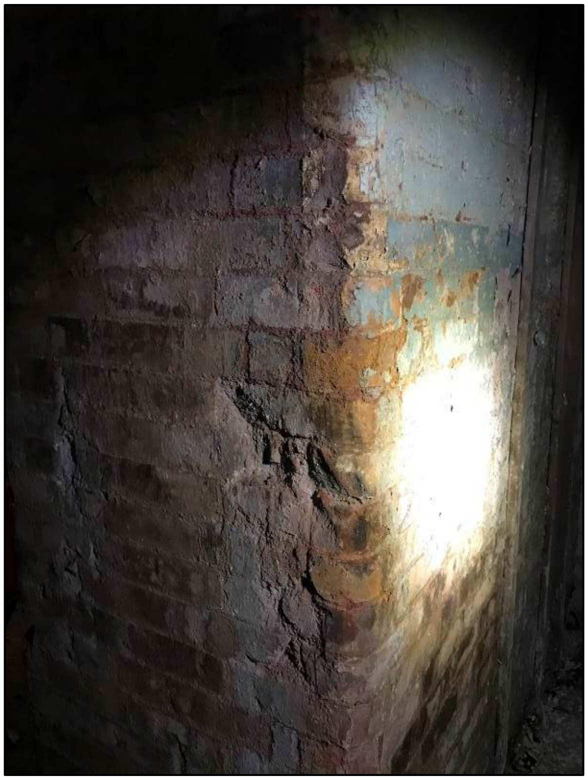


Figure 41: Pressed brick with peeling paint, mold, water infiltration, and demolition damage.


Figure 42: Pressed brick with red tinted mortar beneath peeling paint.


Figure 43: West elevation wall demolition damage.


Figure 44: Pressed brick pile in basement.

Figure 45: Fifth floor stair tower with peeling paint.

Figure 46: Fifth floor stair tower with peeling paint and efflorescence.

Figure 47: Stairs with peeling paint and mold.

Figure 48: Wrought iron railing.

IV. RECOMMENDATIONS

The following recommendations are based on the results of the survey. Due to its historic character, original materials which are intact and in a condition that they can be repaired should be preserved, salvaged, and reused as much as possible including bricks, cast iron, wrought iron, and hardware. Original brick removed from the interior of the building should be cleaned of paint and other soiling and reused to repair and rebuild sections of the exterior, particularly bullnosed corner brick.

The masonry materials, brick and brownstone, on the building exterior are in good enough condition to be repaired. The repairs required are traditional repairs such as pointing, patching, crack repair, cleaning, and infilling brick losses with new or salvaged brick.

Recommendations for When Design and Preservation/Restoration Direction of Site is Determined

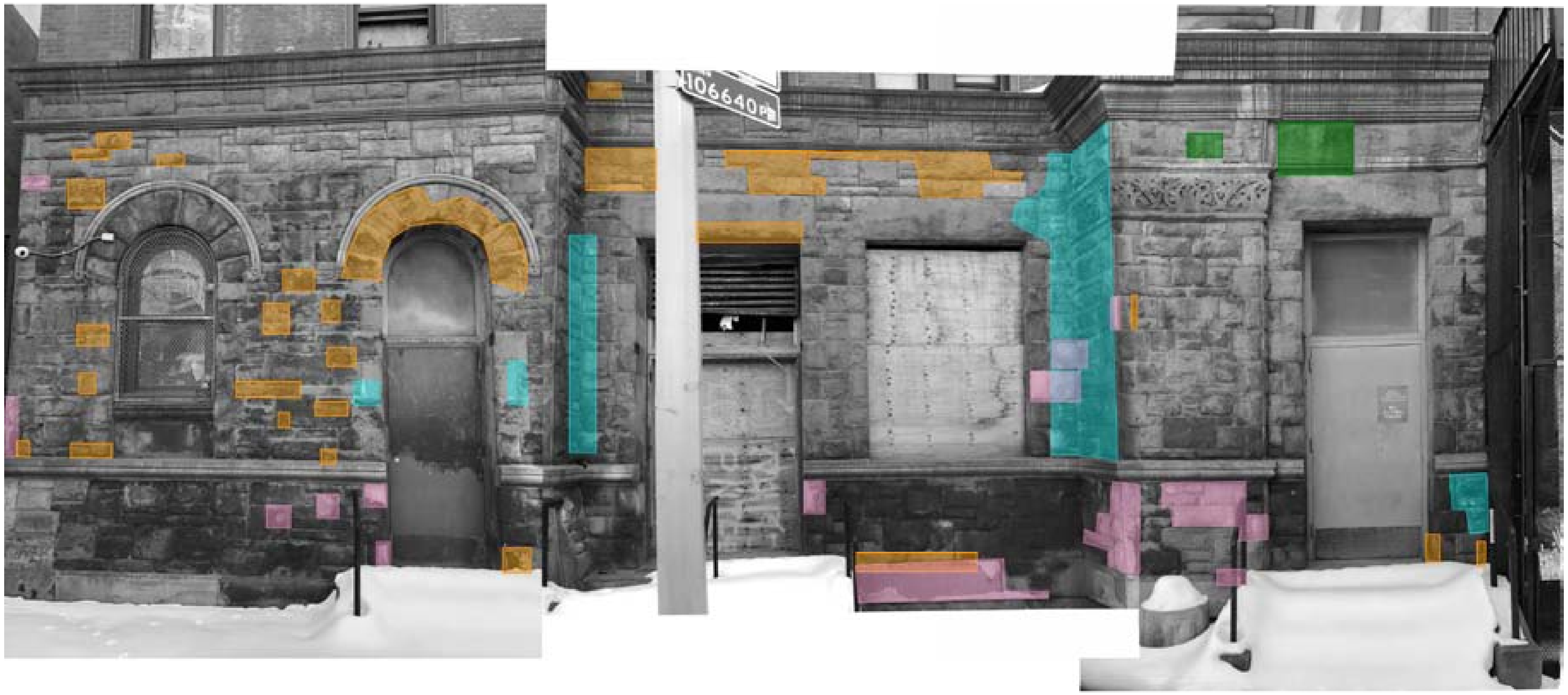
1. Protect the two former interior brick walls on the north and east faces of the tower from the elements that are now exposed. The protection can be long term temporary until the new portion of the building is built.
2. An engineer will need to design a means of tying the top levels of brick to the backup wall to maintain the integrity of the clipped brick bond. For losses of brick, there is enough pressed brick in the interior to use for infill. Use cleaned, salvaged pressed brick from the interior if additional bricks are required.
3. Maintain weather tightness of the top of the second story façade wall below the temporary roof to keep it intact until the remaining portion of the original building is reused in a new structure.
4. Replace missing and damaged brick around the windows and the rest of the stair tower with salvaged pressed brick.
5. Repoint all open joints in the brick and brownstone. The new mortar shall match the original materials and be sympathetic to the original masonry.
6. Repair cracks in the brownstone.
    a. Cracks that are hairline to 1/8-inch in width shall be repaired using injection grout followed by a restoration patching mix custom-matched to the brownstone.
    b. Cracks that are larger the 1/8-inch shall be patched using a restoration patching mix custom-matched to the brownstone.
7. Remove loose and delaminating brownstone and failed patches down to sound brownstone. Superficial losses can be left as-is.
8. Patch losses ½-inch to 2-inches in depth with a restoration mortar custom-matched to the existing brownstone.
9. Repair losses greater than 2-inches in depth with a dutchman repair, which is an inset selectively replacing only the fault in a stone with new stone material that is cut and finished to match the surrounding brownstone.

10. Remove abandoned anchors from masonry. Patch resulting holes with restoration patching mortar custom-matched to the surrounding masonry.
11. Clean all general soiling, efflorescence, biological growth, paint, and graffiti from all surfaces of the masonry with chemical cleaners. Perform cleaning tests to determine the most effective, yet gentlest product to remove soiling.
12. As the building interior is demolished and cleaned for the new structure, every attempt should be made to locate any remaining hardware and salvage it for use in the new building. Collect all loose pressed brick for reuse or recycling.

Appendix A
Conditions Graphics

70 Mulberry Street

70 MULBERRY STREET



NOT TO SCALE

GENERAL NOTES

- Atmospheric soiling on the exterior, typ.
- Abandoned anchor holes, typ.
- Loss of details in the decorative band and engaged column capitals, typ.
- Water infiltration from ground, rising as high as the water table, typ.
- About 25% of the brownstone facade is patched, mostly in good condition.

KEY

- Crack
- Biological Growth
- Displacement
- Efflorescence / Salts
- Non-matching / Failing Previous Repair
- Spalls / Material Loss / Delamination

MULBERRY STREET ELEVATION
First Story - Exterior
March 2021

JABLONSKI BUILDING CONSERVATION
EXISTING CONDITIONS - 1

70 MULBERRY STREET

NOT TO SCALE

GENERAL NOTES

- Atmospheric soiling on the exterior, typ.
- Abandoned anchor holes, typ.
- Loss of details in the decorative band and engaged column capitals, typ.
- Water infiltration from ground, rising as high as the water table, typ.
- About 25% of the brownstone facade is patched, mostly in good condition.

KEY

Crack	Efflorescence / Salts
Biological Growth	Non-matching / Failing Previous Repair
Displacement	Spalls / Material Loss / Delamination

MULBERRY STREET ELEVATION
First Story - Exterior
March 2021

JABLONSKI BUILDING CONSERVATION

EXISTING CONDITIONS - 2

70 MULBERRY STREET

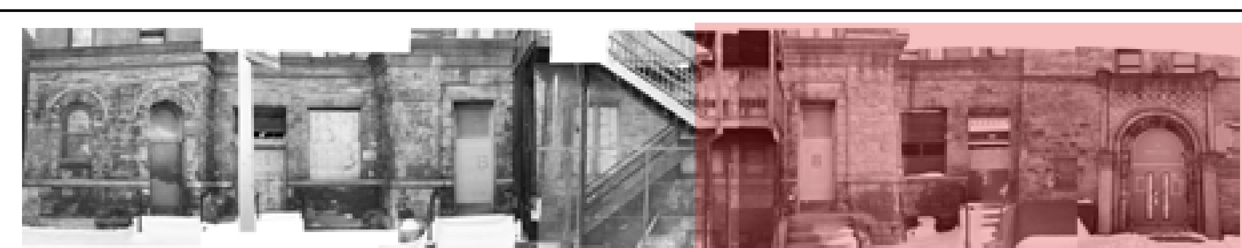
NOT TO SCALE

GENERAL NOTES

- Atmospheric soiling on the exterior, typ.
- Abandoned anchor holes, typ.
- Loss of details in the decorative band and engaged column capitals, typ.
- Water infiltration from ground, rising as high as the water table, typ.
- About 25% of the brownstone facade is patched, mostly in good condition.

KEY

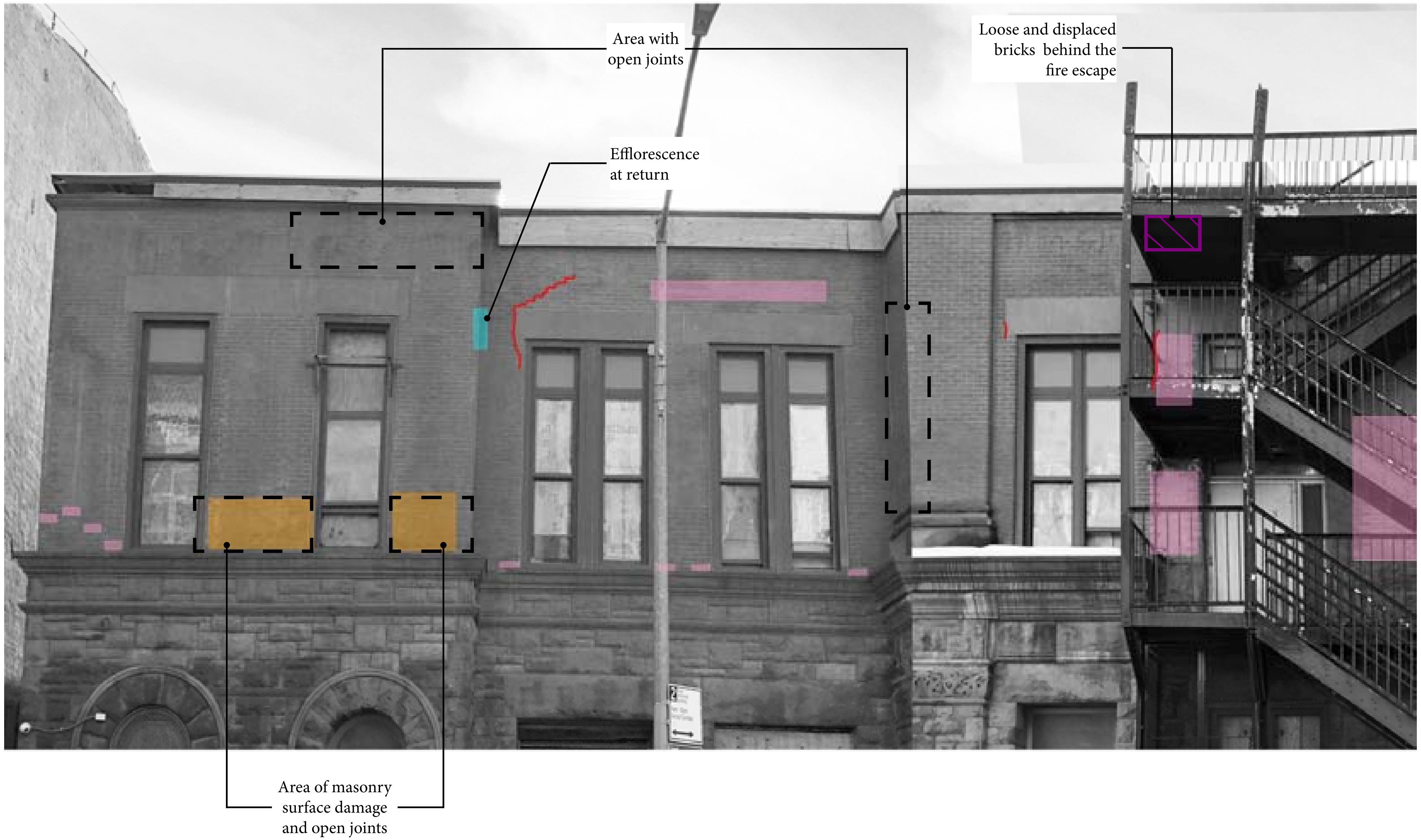
- Crack
- Biological Growth
- Displacement
- Efflorescence / Salts
- Non-matching / Failing Previous Repair
- Spalls / Material Loss / Delamination



MULBERRY STREET ELEVATION
First Story - Exterior
March 2021

JABLONSKI BUILDING CONSERVATION
EXISTING CONDITIONS - 3

70 MULBERRY STREET



NOT TO SCALE

GENERAL NOTES

- Bricks are mostly in good condition
- Atmospheric soiling on the exterior, typ.
- Open joints, typ.
- Multiple repair areas
- Bricks at the bottom corners of windows have been replaced, typ.

KEY

Crack	Efflorescence / Salts
Biological Growth	Non-matching / Failing Previous Repair
Displacement	Spalls / Material Loss / Delamination

MULBERRY STREET ELEVATION
Second Story - Exterior
March 2021

JABLONSKI BUILDING CONSERVATION
EXISTING CONDITIONS - 4

70 MULBERRY STREET

NOT TO SCALE

GENERAL NOTES

- Bricks are mostly in good condition
- Atmospheric soiling on the exterior, typ.
- Open joints, typ.
- Multiple repair areas
- Bricks at the bottom corners of windows have been replaced, typ.

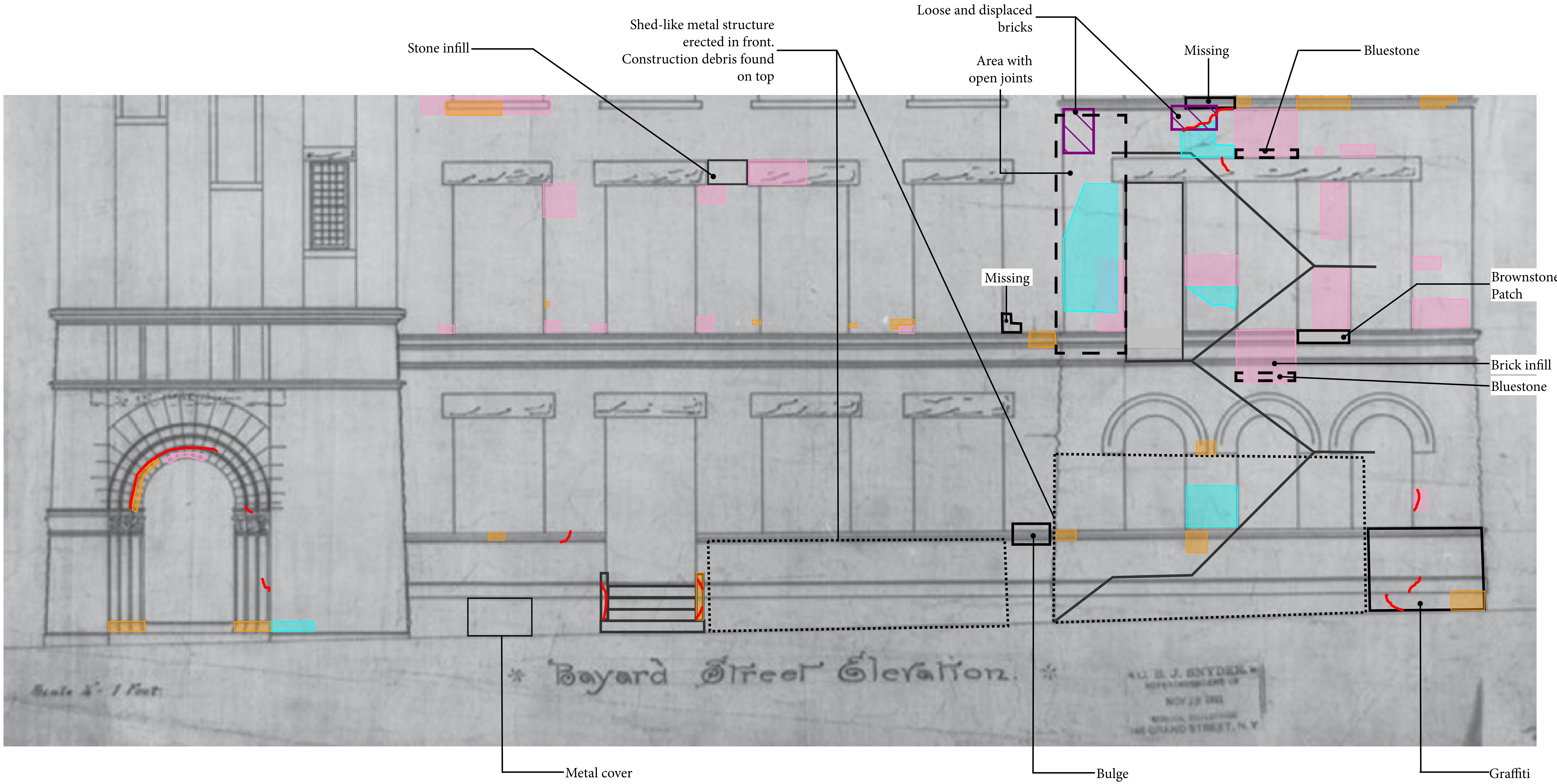
KEY

Crack	Efflorescence / Salts
Biological Growth	Non-matching / Failing Previous Repair
Displacement	Spalls / Material Loss / Delamination

MULBERRY STREET ELEVATION
Second Story - Exterior
March 2021

JABLONSKI BUILDING CONSERVATION

70 MULBERRY STREET



NOT TO SCALE

KEY

- Crack
- Biological Growth
- Displacement
- Efflorescence / Salts
- Non-matching / Failing Previous Repair
- Spalls / Material Loss / Delamination

GENERAL NOTES

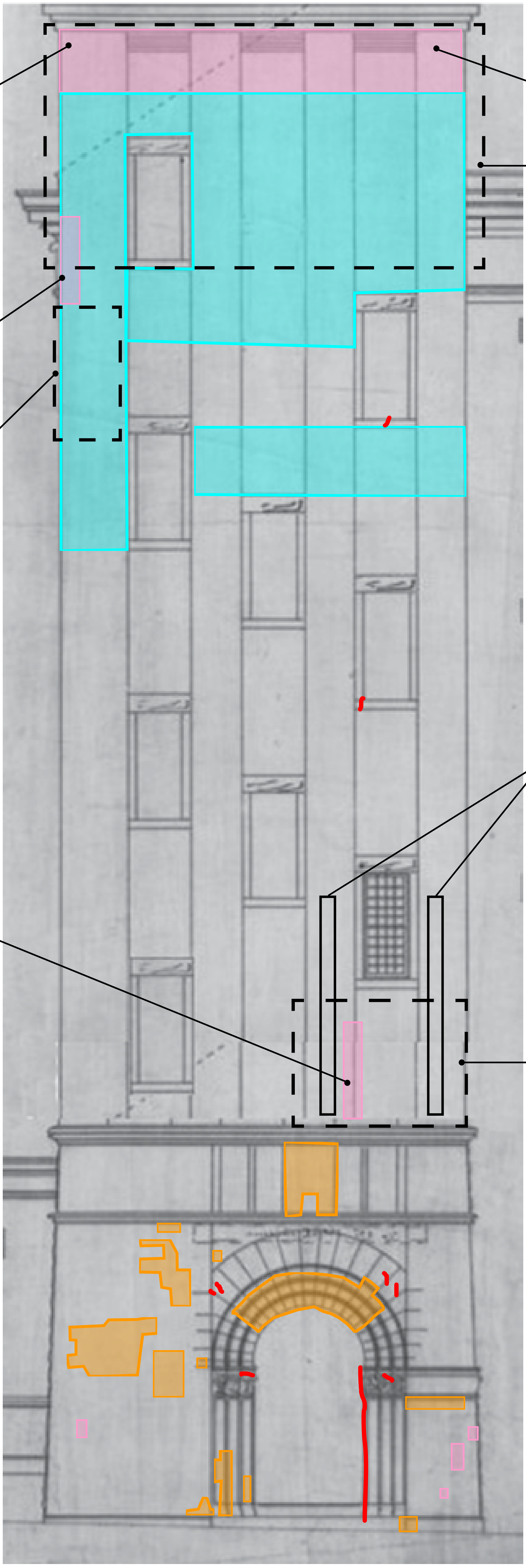
- Atmospheric soiling on the exterior, typ.
- Abandoned anchor holes, typ.
- Loss of details in the decorative band and engaged column capitals, typ.
- Water infiltration from ground, rising as high as the water table, typ.
- About 25% of the brownstone facade is patched, mostly in good condition.

BAYARD STREET ELEVATION
First and Second Story- Exterior
March 2021

JABLONSKI BUILDING CONSERVATION

EXISTING CONDITIONS - 6

70 MULBERRY STREET



NOT TO SCALE

KEY

- Crack
- Biological Growth
- Displacement
- Efflorescence / Salts
- Non-matching / Failing Previous Repair
- Spalls / Material Loss / Delamination

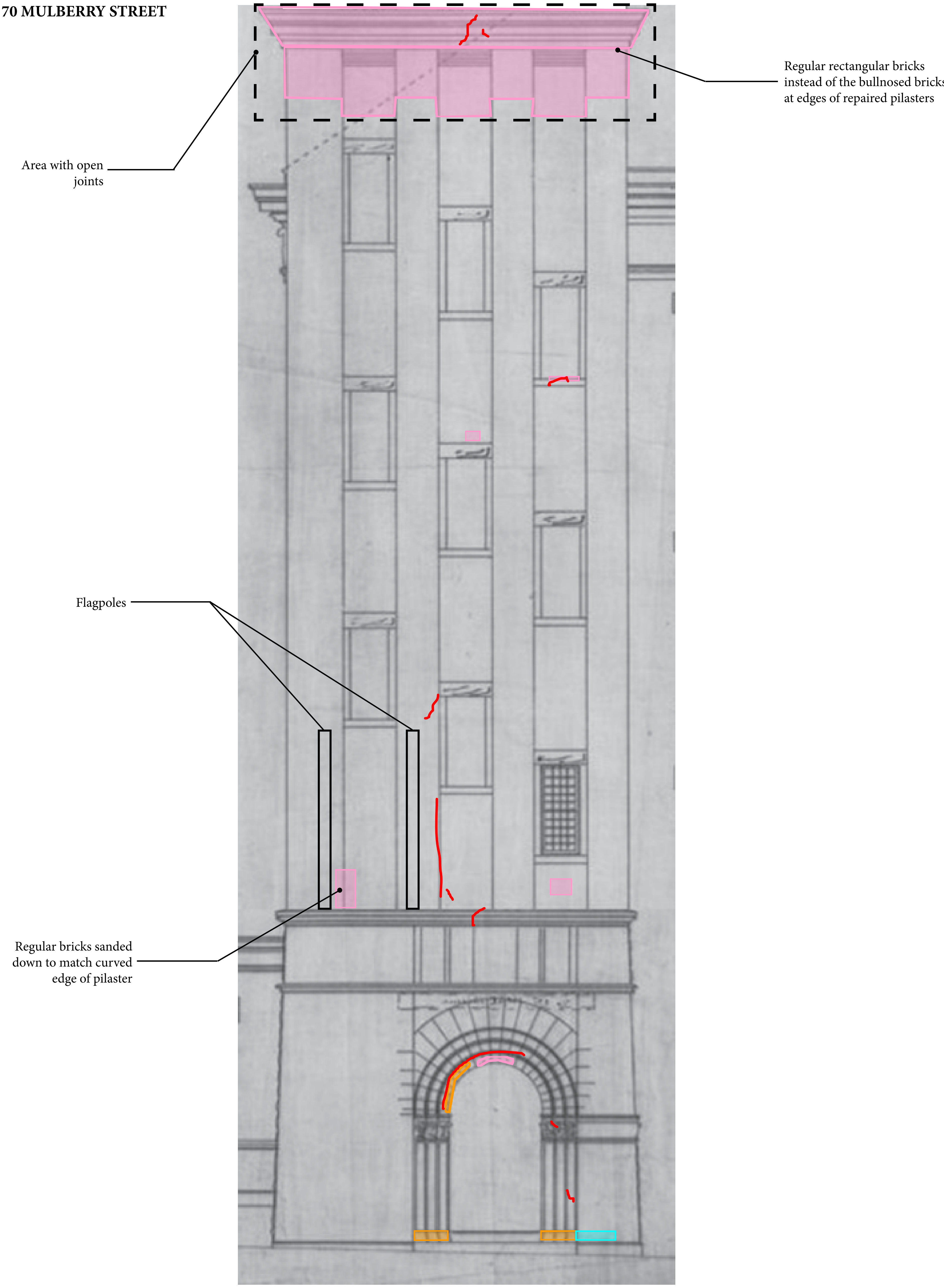
GENERAL NOTES

- Area of open joints and efflorescence near the top of the stair tower, typ.
- Atmospheric soiling on the exterior, typ.
- Heavy soiling below stone window sill, typ.
- Loss of details in the decorative brownstone band and engaged column capitals, typ.
- Water infiltration from ground, rising as high as the water table, typ.

WEST ELEVATION
Stair Tower - Exterior
March 2021

JABLONSKI BUILDING CONSERVATION

70 MULBERRY STREET



NOT TO SCALE

KEY

- Crack
- Biological Growth
- Displacement
- Efflorescence / Salts
- Non-matching / Failing Previous Repair
- Spalls / Material Loss / Delamination

GENERAL NOTES

- Area of open joints near the top of the stair tower, typ.
- Loss of details in the decorative brownstone band and engaged column capitals, typ.
- Water infiltration from ground, rising as high as the water table, typ.

SOUTH ELEVATION
Stair Tower - Exterior
March 2021

JABLONSKI BUILDING CONSERVATION

70 MULBERRY STREET

NOT TO SCALE

KEY

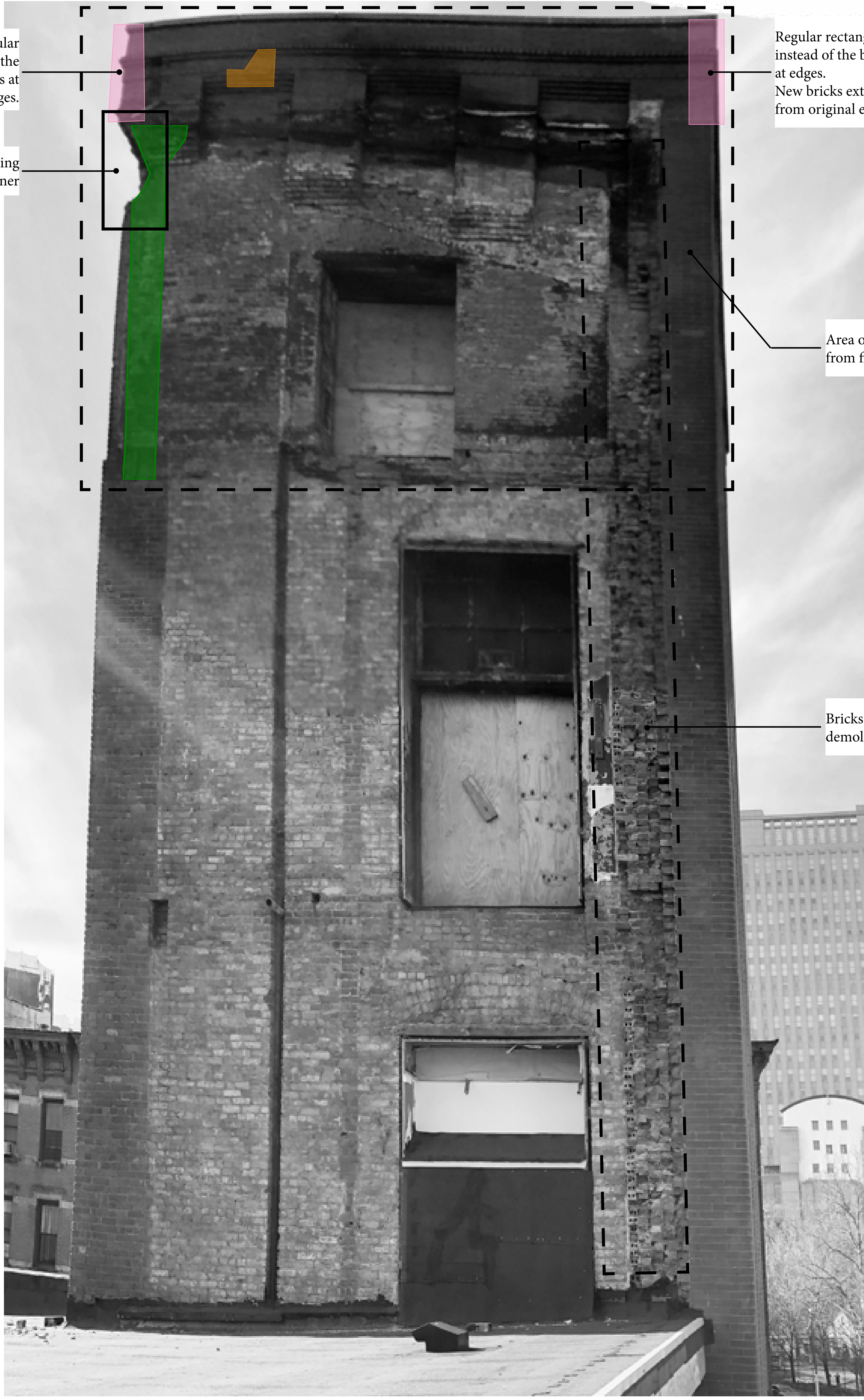
- Crack
- Biological Growth
- Displacement
- Efflorescence / Salts
- Non-matching / Failing Previous Repair
- Spalls / Material Loss / Delamination

GENERAL NOTES

- Face bricks remain along the corners
- Fire damage to the wall of the stair tower above the second story, typ.
- Bricks damaged due to demolition after fire, typ.
- Regular rectangular bricks used instead of bull-nosed bricks at the edges, near the top of the stair tower, typ.

EAST ELEVATION
Stair Tower - Exterior
March 2021

70 MULBERRY STREET



NOT TO SCALE

KEY

- Crack
- Biological Growth
- Displacement
- Efflorescence / Salts
- Non-matching / Failing Previous Repair
- Spalls / Material Loss / Delamination

GENERAL NOTES

- Face bricks remain along the corners
- Fire damage to the wall of the stair tower above the second story, typ.
- Bricks damaged due to demolition after fire, typ.

NORTH ELEVATION

Stair Tower - Exterior

March 2021

JABLONSKI BUILDING CONSERVATION

Appendix B
Conditions Glossary

70 Mulberry Street

EXTERIOR CONDITIONS

Abandoned / Removed Anchor

Anchors are inserted into masonry to fasten items such as wires or signage. Unused ferrous anchors can lead to deterioration of the masonry when the anchors corrode and the expansion forces of the corrosion crack the masonry. Corrosion of any metallic anchors can also stain the adjacent masonry.

When a ferrous anchor has been removed or has corroded and fallen off, a hole remains in its place. Most holes are only aesthetically damaging. However, water can enter and sit in the hole and freeze in cold temperatures which can crack the masonry. [8]

Anchor holes are typical in both brownstone and brick on the exterior façades of 70 Mulberry Street. Abandoned anchors were found in the brick immediately above the brownstone string course at the main entrances on both Mulberry Street and Bayard Street.

Atmospheric Soiling

Atmospheric soiling is the accumulation of air pollutants on the surface of the building over time. It is most often found as a black crust on the undersides and faces of the masonry. This crust is primarily composed of black carbon carried in the air and deposited on the building. Areas protected from rain, such as the undersides of cornices, tend to exhibit a greater build-up of crusts.

Atmospheric soiling is a typical condition of both the brownstone and brick masonry exterior facades. It is particularly heavy at the brownstone string course and behind the fire escape stairs as well as the corners of the second story on both elevations.

[8] Freeze-thaw damage occurs when water is trapped inside masonry and then freezes when the temperature drops below 32° F. This causes the water to expand and crack or displace the surrounding masonry.

Biological Growth

Biological growth on masonry is a symptom of excess moisture in the masonry. Biological growth can be present in the form of micro-flora such as algae, moss and lichen, or macro-flora such as vines and saplings. Bacteria and lichen produce oxalic acids that damage masonry. Biological growth clogs pores, thus making it hard for water to escape and this will also farther deterioration of masonry.

Biological growth was noted primarily on the brownstone in areas around the fire escape stairs on both Mulberry and Bayard Street facades. Some biological growth was also seen along the northeast corner of the stair tower.

Bulging

Bulging occurs when a portion of a wall sticks out in a rounded lump. Often this rounded lump is hollow behind, indicating a detachment from the substrate behind. Bulging most often occurs in walls with a multi-layered composition.

Bulging was noted in the brownstone band at the plinth level immediately on the west side of the fire escape on the Bayard Street elevation.

Crack

A crack is an individual fissure, visible to the naked eye, resulting from the separation of one part from another. When tension is relieved in a material, it cracks. Cracking may be due to weathering, flaws in the material, rusting ferrous embedments, excessively hard repair materials, vibrations, expansion and/or contraction due to temperature fluctuations, efflorescence, and ice formation within the material.
A crack can follow the path of two or more connecting joints without fracturing any units; or it can follow through more than one unit or several connected cracks within one unit.

Masonry cracks are caused by several different deterioration mechanisms. Stresses such as excessive sheer, compressive or tensile loads, or impact can crack masonry. Cracks are often indicators of greater structural issues. Cracks in the masonry allow water and salts to infiltrate, thereby leading to additional deterioration.

Large cracks were found in the brownstone at both the main entrances running along the joints of the engaged columns and the archivolt. Steps cracks or cracks running through mortar joints were visible in the brick facades of the second story on both elevations. Cracks originating at the corners of stone lintels are typical.

Displacement

Displacement occurs when an element or a portion of a building moves out of plane from its original location. Displacement can create problems of open joints between elements that can exacerbate existing conditions and cause instability of surrounding elements. It will allow greater water infiltration if the displaced unit joints are not sealed, or if the unit is not reset. Displaced elements may eventually fall from the structure and can present safety hazards for passers-by.

Displacement of bricks, most likely from demolition damage, was observed at the top corners of the fire escapes on both Mulberry Street and Bayard Street.

Efflorescence

Efflorescence is the presence of soluble salts found on the surface of a material, manifested as a powdery bloom. As water containing soluble salts evaporates from the masonry, it deposits the salts on the masonry surface. The salt may originate from external sources like de-icing salts or bird guano and enter the masonry via capillary action, or the salts may exist within the masonry itself, a condition typical for concrete.

Subflorescence, the subsurface crystallization of soluble salts, is a related condition which is often more dangerous. As the salts crystallize, they expand in size. This expansion exerts pressures against the pore walls within the masonry, frequently resulting in spalls, cracks or large-scale losses to the surface. Cyclical hydration and recrystallization of the salts can rupture the pore structure and hasten deterioration of the material.

Efflorescence is present on both brownstone and brick masonry on the exterior at 70 Mulberry Street, primarily in all the returns. It was notable on the brownstone at the north side of the fire escape on Mulberry Street elevation, on the brick at the east side of the Bayard Street elevation, and under the window sills in the stair tower.

Graffiti

Graffiti is generally intentional vandalism using paint, markers, pens and sharp objects (knives), etc. Additional resulting damage can occur when improper methods are used to remove the graffiti such as the use of abrasives, water, or solvents.

Graffiti was noted on a section of brownstone at the east corner of Bayard Street elevation.

Impact Damage

Impact damage is generally unintentional damage to a material by mechanical equipment and people contact

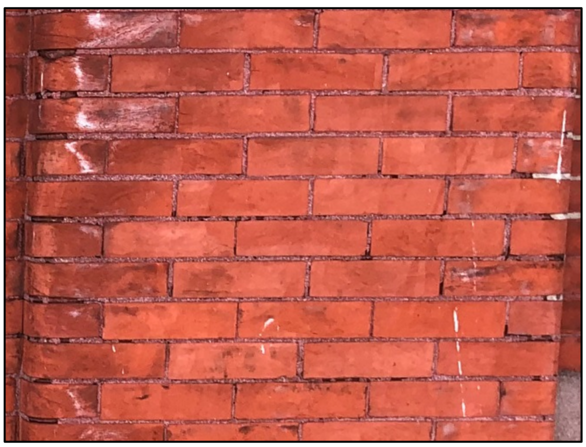
Bricks behind the fire escapes, especially below the temporary roof at the top, and on the north and east facades of the stair tower have been damaged due to demolition after the fire.

Material Loss / Missing Elements

Loss of building material occurs when the fabric's displacement or deterioration is so extreme that it falls away from the building or have been removed.

Some sections of the brownstone window sills of the now-demolished third story, which remain below the temporary roof on both facades at 70 Mulberry Street, are missing. There are small areas of brick missing below the temporary roof behind both the fire escapes, and at the top northeast corner of the stair tower.

Open Joints



The severe deterioration of mortar joints between masonry units can result in mortar loss.

Mortar can fail for a number of reasons: movement of the masonry wall, inappropriate mortar mix and installation, erosion, water infiltration, freeze-thaw damage, acid attack and physical movement. Once the mortar joints have failed, water can enter the masonry wall and cause additional deterioration.

Majority of the open joints were observed primarily in the brick masonry on the second story and the stair tower. There were a few locations of open joints in the brownstone masonry especially in the string course on both elevations.

Previous Repairs

Infill and Non-matching Masonry

Masonry infill can occur for several reasons including a change in use, alterations to the building, previous material failure. Care must be taken when removing the infill that the historic building fabric is not damaged.

There are few sections of infill masonry in the brick façade, primarily behind the fire escapes and around windows on the second story. Approximately twenty-five courses below the parapet of the stair tower are replacement bricks and do not replicate the bullnose edge of the rest of the stair tower. A small area of brownstone behind the fire escape on Bayard Street has been replaced with brick.

Patching

Patching is a repair technique that fills losses, usually with a cementitious or bituminous coating. It can be found where there are large areas of missing or damaged material, or over areas of mechanical damage or alterations. Patching is inappropriate when it does not match the original material in terms of composition, shape, color, or surface texture. Inappropriate patching can also trap moisture beneath the surface, allowing additional deterioration to occur behind the patch.

Approximately 20-25% of the brownstone façade on both Mulberry Street and Bayard Street elevations has been patched and are mostly in good condition with minor cracks and spalls on some.

Repointing

Repointing is a repair technique where failed, existing mortar is removed or raked back to sound mortar and replaced with new mortar. Repointing can be inappropriate for a number of reasons: if damage has been done to the masonry during the raking process; if a mortar is used that is physically incompatible or harder than the masonry; if the repointing mortar is aesthetically incompatible with the existing mortar; or if the mortar was incorrectly applied. Mortar that is too hard or impermeable can cause the surrounding masonry to deteriorate preferentially.

In areas of brick repair on the exterior at 70 Mulberry Street, either a red tinted mortar or a gray mortar has been used with the replacement brick.

Surface Damage / Loss

Delamination

Delamination is a detachment process affecting laminated stones (mostly sedimentary rocks and some metamorphic rocks). It corresponds to a physical separation into one or several layers following the stone laminate (layers). The thickness and the shape of the layers are variable. The layers may be oriented in any direction with regards to the stone surface.

Delamination may be caused by the swelling and shrinking of clays in the sedimentary layers during wetting and drying, or it may be caused by the crystallization of soluble salts between sedimentary layers.

Delamination of the brownstone is typical on both Mulberry Street and Bayard Street elevations. Surface erosion due to weathering was noted on the engaged column capitals at both the main entrances.

Spall

Spalls, or the loss of surface material in masonry components, generally occur as the result of a buildup of stresses occurring below the surface. When the stresses become significant enough to fracture the material, pieces detach from the body and fall away. Internal stresses may be caused by corrosion of metallic anchors or subsurface metal, deterioration of patches or glazed surfaces, freeze/thaw cycles, or crystallization of salts beneath the surface. Spalls can also be caused by external forces such as the application of a non-breathable coating trapping moisture inside the masonry, impact, or vandalism.

Spalls present at 70 Mulberry Street are primarily minor. These were found especially in areas of previous repair, in the brownstone archivolts of both entrances, arches above doors and windows on the Mulberry Street elevation. There were spalls near base of the engaged columns at both the entrances.

Water Infiltration / Stains

Water, percolating though masonry, can solubilize and transport dissolved materials. As the water evaporates, the dissolved materials can then remain on the surface of the masonry. Water stains are often the sign of excess moisture in the masonry.

Visual evidence of water infiltration from the ground (following heavy snow) was noted on both facades at 70 Mulberry Street. Almost all the masonry below the brownstone band at the plinth level was damp to the touch. This indicated presence of excess moisture in the masonry that was also reflected through efflorescence and biological growth on both brownstone and brick masonry. Water staining was also noted immediately below the temporary roof on the exterior on both elevations. Ferrous metal reinforcement and anchors installed inside masonry walls can corrode due to the infiltration of moisture through the masonry that can deteriorate existing conditions of the masonry.

INTERIOR CONDITIONS

Ferrous Metal Corrosion

Ferrous metal consists of cast and wrought iron. Cast iron can be used decoratively and can clad the entirety of a building's exterior. Wrought iron is often used for fencing, signage, or to protect windows from being broken into, especially those located in the ground floor. Ferrous metal requires regular maintenance in the form of painting. Unpainted ferrous metal corrodes when in contact with moisture and air.

Minor corrosion of the cast iron column bases is typical. The base of column 3 on the first floor was observed to have material loss due to heavy corrosion.

Ferrous Metal Staining

As water washes over corroding ferrous metal it deposits surface stains, generally a yellowish orange color, on the adjacent masonry. This staining is primarily an aesthetic issue and does not affect the durability of the masonry. In many cases, staining can serve to indicate other related forms and causes of deterioration in the masonry.

Rust staining was noted on many of the painted cast iron column shafts.

Open Seam / Separation

The seams of cast iron elements can separate due to the expanding metal resulting from corrosion buildup. These open joints will allow greater water infiltration if not sealed and exacerbate the ferrous metal corrosion which can lead to material loss.

Open seams were noted at the cast iron bases of columns 3, 7 and 8 in the central space on the first floor.

Peeling Paint

Peeling paint is the detachment of the paint layers from its substrate. Paint can peel due to a number of reasons including water infiltration from behind, paint applied to an alkaline surface, expansion and/or contraction of the substrate, or over-painting with incompatible paint.

Peeling paint is typical on majority of the painted cast iron columns and pressed brick walls on the first floor interior at 70 Mulberry Street. Peeling paint was also observed in the interior walls of the stair tower.