

66-68 West 10TH STREET NY, NY: TAX LOT PHOTO (1940)

THE SUBMISSION CONSISTS OF 2 PROPERTIES, 66 WEST 10TH STREET AND 68 WEST 10TH STREET FOR WHICH 2 APPLICATIONS ARE BEING REVIEWED CONCURRENTLY. APPLICATION LPC-20-03341 IS TO REQUEST THAT THE LANDMARKS PRESERVATION COMMISSION ISSUE A REPORT TO THE CITY PLANNING COMMISSION RELATING TO AN APPLICATION FOR A MODIFICATION OF USE TO ALLOW COMMERCIAL USE AT THE BASEMENT FLOOR OF 66 WEST 10TH STREET. APPLICATION LPC-20-03340 IS TO MODIFY A WINDOW OPENING AT THE GROUND FLOOR OF 68 WEST 10TH STREET AND INSTALL A DOOR TO PROVIDE BARRIER-FREE ACCESS.

RESTORATIVE WORK FOR 66 WEST 10TH ST WILL BE FILED UNDER LPC-20-06698 FOR A STAFF LEVEL PERMIT.

MICHAEL SCHMITT ARCHITECT PC.



01.10.2020 P.2



1 EXISTING PHOTOS: 2019









LOWER EXG WINDOW SILL TO CELLAR LEVEL. PROVIDE STONE MATERIAL TO MATCH EXG MATERIAL & PATTERN.



66-68 WEST 10TH STREET MICHAEL SCHMITT ARCHITECTPC. 01.10.2020 P.3



EXISTING PHOTOS: 2019



 $2^{\,\text{PROPOSED}\,\text{BARRIER}\,\text{FREE}\,\text{DOOR}\,\text{ACCESS}\,\text{WITH}\,\text{INTERIOR}\,\text{LIFT}}$







e de la cara da

EXG HEAH 6,-9 1/2"



EXG AREA WAY FLOOR LEVEL

3 PARTIAL SECTION: MODIFIED WINDOW OPNG. $1/4^{"} = 1'-0^{"}$



STONE WORK @NEW DOOR OPNG.

1 EXISTING BUILDINGS WITH MODIFIED ENTRANCES (10TH STREET)

64 W 10th STREET



54 W 10th STREET



31 W 10th STREET



29 W 10th STREET









43 W 10th STREET









TAX LOT PHOTO 3 EXISTING PHOTOS

EXISTING 2019







PROPOSED ENLARGED ELEVATIONS 66-68 WEST 10TH STREET MICHAEL SCHMITT ARCHITECT PC. 01.10.2020 P.8





4 EXG 1ST FLR WINDOW: 2019







^{01.10.2020} P.10



EXTERIOR STAIR & SIGN DETAILS



PHOTOS OF EXISTING RAILINGS: 2019



REQUIRED.

DECORATIVE GUARDRAIL TO COMPLY W/ CODE.



LEGEND				
\sim	CRACK			
-~ <u>`</u>	STEP CRACK			

REPLACE

PATCH

+ + + + CLEAN



WEST 10TH STREET

1 PLAN DIAGRAM 1/32" = 1'-0"

RESTORATION RECOMMENDATIONS FRONT FACADE



- (1) REPLACE FAILING PATCHES IN SHEET METAL CORNICE
- (2) PATCH SHEET METAL CORNICE IN KIND
- REMOVE ATMOSPHERIC SOILING WITH 3 APPROPRIATE CLEANER, TO BE TESTED
- (4) REPLACE DETERIORATED WOOD IN KIND
- (5) PATCH MASONRY SPALL/CRACK
- (6) REPOINT
- (7) REPAIR/PATCH PARGING
- (8) REPLACE RUSTED METAL COPING WITH BLUESTONE

- CRACK

۲ <u>. </u>	STEP	CRACK

REPLACE $\mathbb{V}//\mathbb{A}$

 \boxtimes PATCH

+ + + +

CLEAN





WEST 10TH STREET

1 PLAN DIAGRAM 1/32" = 1'-0"

RESTORATION RECOMMENDATIONS SIDE FACADE



1) REPLACE FAILING PATCHES IN SHEET METAL CORNICE

- (2) PATCH SHEET METAL CORNICE IN KIND
- (3) REMOVE ATMOSPHERIC SOILING WITH APPROPRIATE CLEANER, TO BE TESTED

(4) REPLACE DETERIORATED WOOD IN KIND

(5) PATCH MASONRY SPALL/CRACK

6 REPOINT

(7) REPAIR/PATCH PARGING

8 REPLACE RUSTED METAL COPING WITH BLUESTONE

2 EXPOSURE 3: REAR FACADE

LEGEND

CRACK

STEP CRACK

REPLACE

PATCH





1 PLAN DIAGRAM 1/32" = 1'-0"

RESTORATION RECOMMENDATIONS REAR FACADE



- 1 REPLACE FAILING PATCHES IN SHEET METAL CORNICE
- (2) PATCH SHEET METAL CORNICE IN KIND
- (3) REMOVE ATMOSPHERIC SOILING WITH APPROPRIATE CLEANER, TO BE TESTED
- (4) REPLACE DETERIORATED WOOD IN KIND
- (5) PATCH MASONRY SPALL/CRACK
- 6 REPOINT
- (7) REPAIR/PATCH PARGING
- (8) REPLACE RUSTED METAL COPING WITH BLUESTONE

---- CRACK

ч <u> </u>	STEP	CRACK

REPLACE

PATCH





1 PLAN DIAGRAM 1/32" = 1'-0"

RESTORATION RECOMMENDATIONS SIDE FACADE



- 1 REPLACE FAILING PATCHES IN SHEET METAL CORNICE
- (2) PATCH SHEET METAL CORNICE IN KIND
- (3) REMOVE ATMOSPHERIC SOILING WITH APPROPRIATE CLEANER, TO BE TESTED
- (4) REPLACE DETERIORATED WOOD IN KIND
- (5) PATCH MASONRY SPALL/CRACK
- 6 REPOINT
- 7 REPAIR/PATCH PARGING
- (8) REPLACE RUSTED METAL COPING WITH BLUESTONE



LEGEND

\sim	CRACK
- <u>`</u>	STEP CRACK

REPLACE

PATCH

RESTORATION RECOMMENDATIONS ROOF PLAN

RESTORATION RECOMMENDATIONS

66 WEST 10TH ST NEW YORK, NY



Prepared for: H.O. Realty 1776 Broadway, Suite 1720 New York, NY 10019

Prepared by: Jablonski Building Conservation, Inc. 40 West 27th Street, Suite 1201 New York, NY 10001

January 10, 2020

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INTRODUCTION

Jablonski Building Conservation, Inc. (JBC) was contracted by H. O. Realty to produce a conditions assessment overview and provide repair recommendations for the exterior of 66 West 10^{th} Street. These recommendations were based on the existing conditions drawings provided by the client, as well as surveys conducted by conservator Gabriela Figuereo. These recommendations include a proposed treatment plan, repair and replacement materials, and a maintenance plan.

METHODOLOGY

The exterior façade of 66 West 10th St was inspected by conservator Gabriela Figuereo on December 4th and 13th, 2019 and January 2nd, 2020. This inspection was conducted from the ground with the aid of binoculars, from the fire escapes, and from the roof. The assessment included photo documentation and graphics to document the as-found conditions and needed repairs. The conditions were documented on architectural drawings provided by the client. Digital photographs were taken to record conditions. A conditions glossary is included in Appendix A of this report. Based on this conditions assessment, repair recommendations have been made.

HISTORY AND DESCRIPTION

66 West 10th Street is a five-story building with a basement level in Greenwich Village, Manhattan, NY. Both 66 and 68 West 10th St were constructed in 1892 as identical apartment buildings, designed by George Keister.¹ The buildings are located within the Greenwich Village Historic District, which was designated in 1969.

The buildings have a brownstone base at the first two stories and the basement level. The upper three stories are brick with sandstone window surrounds on the third and fourth stories. The fifth story windows have sandstone lintels and a sandstone band course, and on both sides of each window there is a trim of molded brick that is a darker reddish color than the surrounding brick. Both buildings have a sheet metal cornice as well as a front fire escape adhered to the central two windows on the upper four stories. The East, South, and West façades are comprised of brick that has a parge coating on the fifth story and basement levels. The parapets have a bluestone coping that has been covered with sheet metal in some areas.

Molded brick was commonly manufactured by the end of the 19th century. An 1880 catalogue from the Waldo Brothers features "moulded" brick as part of their inventory.² This type of brick was molded, rather than pressed or extruded, into a variety of decorative shapes. The molded brick used in 66 and 68 West 10th St is curved along the sides of the fifth story windows. This brick appears to be original to the building. The difference in color from the surrounding buff brick was likely an aesthetic choice to emphasize the polychromy of the brick and sandstone.

¹ New York City Landmarks Preservation Commission, "Greenwich Village Historic District Designation Report," LP-0489 (New York: New York City, 1969), 83-84.

² Waldo Brothers, [Distributor's Catalog] (Waldo Brothers: Boston, MA), 1880.

CONDITIONS ASSESSMENT - OVERVIEW

The exterior façades at 66 West 10^{th} St have undergone various campaigns of previous repairs. Many of these repairs were inappropriate to the building material and have damaged the original material or are otherwise failing. The owner of 66 W 10^{th} St has stated that the building was power washed within the last 20 years. It is not recommended that this be done again, and instead, a Cleaning Test Program will be implemented to determine the appropriate method of cleaning.

On the front façade of 66 W 10th Street, the sheet metal cornice has corroded in some areas and some elements of the cornice are missing. Previous patches to the cornice have failed and are in need of replacement. The sandstone window surrounds on the third and fourth stories have eroded in some areas, and there are some spalls in the decorative sandstone elements. There are large cracks along the stone band courses on the third and fifth stories. The brick on the upper three stories is in good condition. On the first two stories and the cellar level, the brownstone base is heavily eroded, especially throughout the stoop. The brownstone has been patched in many areas and some of these patches have delaminated or otherwise failed. Some patches are sound; however, the patch color does not match that of the original stone and will need to be stained. The cast iron railings along the ground level have corroded in some areas, and there is a hole in one post base. The inner brick faces on the cellar level need to be repointed. The fire escape has some areas with corrosion and missing elements. There are several large areas of soiling, especially along the band course on the third story and along the rails of the stoop. The windows on the front façade are wood framed with an aluminum sash. The wood is heavily deteriorated and the aluminum is not original.

On rear facades, there is a parge coat along the parapet as well as on the cellar level. The parging on the parapet is cracked around one corner, but is otherwise well-adhered. There are large areas of the brick façade that need repointing. There are a few cracks in the bricks below the sandstone window sills. On many of the window sills there is a bituminous coating at the corners where the sill meets the window frame, and in some cases around the lintels as well. These facades also have some abandoned anchors mounted into the brick face. The fire escape on these façades has areas of corrosion and missing elements, and some bases of the fire escape are unstable.

On the roof, there is a bituminous coating over all of the joints of the bluestone copings. The stone coping has some cracks and spalls. In some areas, the copings have been covered with sheet metal that has heavily rusted.

PROPOSED REPAIRS

The following repair recommendations for 66 West 10th Street have been prioritized according to urgency of repair. The first priority repairs involve potential structural issues, which need to be evaluated by a structural engineer. Second priority repairs include masonry and window issues. Third priority repairs are primarily aesthetic in nature.

As 66 West 10th Street is part of the Greenwich Village Historic District, we recommended that all work meet the Preservation treatment approach defined in the *Secretary of the Interior's Standards for the Treatment of Historic Properties* as: The act or process of applying measures necessary to sustain the existing form, integrity, and materials of the historic property with a focus on the ongoing maintenance and repair of historic materials.³

Priority 1 – Structural Issues

1. Fire Escape

The fire escapes on the front and rear façades of 66 W 10th St have several structural issues. There are broken welds and missing pieces throughout, as well as unstable platforms. The fire escapes need to be assessed by a structural engineer to determine if they are stable and what repairs are necessary. Repair recommendations supplied by the structural engineer supersede these recommendations.

Priority 2 – Repairs

 Parapet Coping Repair and Replacement Remove rusted sheet metal coping and replace with bluestone or a cast stone resembling bluestone.

Replace all heavily spalled or cracked bluestone coping stones.

Remove bituminous coating from bluestone coping.

Fill skyward facing joints with lead T's.

Patch all spalls and cracks in bluestone coping as per recommendations below.

2. Parapet

The parapet has been coated with a parge coat. It should be assumed that this parging was applied because there was deterioration at the parapet masonry. To remove the parging from the parapet will probably damage the brick below it beyond repair. As the parapet is two brick wythes thick, it will be impossible to replace the outer wythe of brick without taking down the entire parapet. The options are to either repair and coat the paraging coat the color of the brick with a silcate coating, or to take down and rebuild the parapet.

3. Parge Coat Repair Route and patch with appropriate material (see section on Repair Materials) if parging is

³ National Park Service, *Secretary of the Interior's Standards for the Treatment of Historic Properties* (Washington, DC: U.S. Department of the Interior, 1995), available at https://www.nps.gov/tps/standards.htm

to be kept.

4. Stone Repair

Patch small spalls (those deeper than 1/2-inch but less than 4-inches) in the stone using breathable composite patching materials that match the surrounding stone in color, texture, tooling and vapor permeability (see section on Repair Materials). The profile of patches applied to carved elements is to match the level of detail, texture, reflectance, and pattern of the element to which it is applied. Patch repairs are required at the brownstone and sandstone on the front façade.

Remove all failing masonry patches and replace with new patches.

Patch and resculpt spalled areas in decorative masonry elements.

Stain sound patches to match the color of the surrounding masonry.

Repair larger spalls (those which exceed 4-inches in depth) using dutchmen. Profile and detailing should match the original element.

For cracks narrower than 3/8-inch, route the crack and patch with composite patching material which matches the color, texture, profile, and vapor permeability of the surrounding clean stone.

Cracks equal to or wider than 3/8-inch shall be patched with approved composite patch material to match the color, texture, profile and vapor permeability of the surrounding clean stone.

Hairline cracks can be left as is.

Caulking used as mortar should be removed and any open joints repointed as per recommendations below. All skyward facing joints should be filled with lead Ts.

Remove all bituminous coatings surrounding the sills throughout the rear facades. Tool any deteriorated stone back to sound stone and patch where necessary to ensure water is properly shed from the wall. Any open joints should be repointed as per recommendations below.

5. Sheet Metal Cornice Repair

Remove existing paint and failing patches and replace in kind.

If the metal is too thin to repair, replace cornice with sheet metal to match existing.

Solder joints to provide waterproofing and seamless edges. Where joints cannot be soldered, rivet in place.

Replace damaged modillion in its entirety. A new modillion is to be remade with pressed sheet metal.

Replace damaged cap flashing in kind.

6. Brick Repair

Leave hairline cracks as is.

Route and patch small cracks in brick walls to prevent water infiltration.

Patching material is to be commercially available composite patching matching the brick in color and texture.

7. Open Joints

Rake and repoint all open or poorly re-pointed joints in the brownstone, sandstone and brick. Repointing mortars should match the historic in color, hardness, tooling profile and

vapor permeability. The mortar should be softer than the masonry to allow proper moisture evaporation from the masonry walls.

8. Scupper Repair

Remove bituminous coating and reapply the parge coat around the scupper on the West façade following the repointing of the surrounding brick.

- Cable Wiring and Abandoned Fixtures Remove all cable wiring from the roof and façades and patch any openings. Remove all abandoned fixtures and patch any openings.
- 10. Cast Iron Repair

Remove existing coatings on the cast iron railings on the front façade. Fill any openings or losses with appropriate filler material (see section on Repair Materials).

Prime and paint to match the original historic finishes.

11. Original Windows and Doors, Front Façade

The windows on the front façade were replaced by the building owner within the last 20 years. The windows should be inspected and all broken or heavily deteriorated wood framing should be replaced in kind or with compatible tight grained wood. Replace all failing window sealant.

Priority 3: Lower Priority Issues

- 1. Cleaning.
 - a. General soiling and biological growth should be cleaned from the surface of masonry with cleaning chemicals as outlined in the section on Repair Materials. A cleaning test program will be undertaken to find the gentlest but most effective cleaners that will not damage the masonry. Large cleaning mock-ups will be performed to ensure the cleaners are effective on a large scale and that the cleaning products have not been modified by the manufacture. Ensure that cleaning products are effective at cleaning the brownstone, sandstone, and brick.

REPAIR MATERIALS

The following is a preliminary list of repair materials that have been suggested based on the proposed treatment and restoration recommendations for $66 \text{ W } 10^{\text{th}}$ Street. These suggestions for repair materials may change as the result of further testing. Repair specifications are to follow pending the approval of the scope of work by the Architect.

Coping materials

- A. All bituminous coatings should be removed from the bluestone copings and replaced with lead T's at all skyward facing joints.
- B. All small cracks and spalls in the bluestone copings should be patched according to the suggestions listed under Masonry Patching.
- C. Replace all deteriorated bluestone coping stones units with cast stone colored to match the existing bluestone.

Masonry Patching

- A. Patching mixes are to be custom color-matched to the masonry using Jahn M120 Masonry Repair Mortar as manufactured by Cathedral Stone Products, Inc., Hanover, MD (800) 684-0901 in the color approved by the Architect. Only Certified Installers may install Jahn M120 Masonry Repair Mortar.
- B. Use crack repair products for large and fine cracks that are compatible with the approved patching mix.
- C. Patches that are sound and do not require replacement but do not match the color of the surrounding masonry should be stained with a potassium silicate paint, such as Keim Mineral Coatings of America, or approved equal.

Parge Coat Repair

- A. Patching materials are to match the color and texture of the original stucco as closely as possible. Cracks to be repaired should be routed and patched. Stucco patching material is to be approved by the Architect prior to installation. Factory controlled mixing is available from the following companies:
 - 1. SPEC MIX Scratch & Brown Pre-blended Stucco as manufactured by SPEC MIX Inc., (888) 773-2649, http://www.specmix.com
 - Jahn M60 Stucco/Plaster as distributed by Cathedral Stone Products, Inc., (800)684-0901, http://www.cathedralstone.com

3. Conpro Stucco as manufactured by Conproco Corp.,(800) 258-3500, http://www.conproco.com.

Sheet Metal Cornice Repair

- A. Patches are to consist of galvanized sheet metal, soldered or riveted in place. Corroded sections or discrete elements are to be remade in kind.
- B. Seam sealer: 505 Seam Sealer as manufactured by Karnak Corporation, Clark, New Jersey, 732-388-0300), or approved equal.
- C. Reinforcement fabric system: 5540 Resat-Mat as manufactured by Karnak Corporation, Clark, New Jersey, 732-388-0300), or approved equal.

Brick Repair

- A. Cracks in brick should be routed and patched. Acceptable sources for patching materials include:
 - 1. St. Astier Lithomex as distributed by Lime Works US
 - 2. Jahn M100 Terra Cotta/Brick as distributed by Cathedral Stone Products, Inc.
 - 3. Matrix as distributed by Conproco Corp.

Repointing Mortar

- A. An analysis of the original mortar is required to match to color and texture. This will be used to develop a custom mix comprising portland cement, lime, and sand (no masonry cement shall be used). Acceptable pre-blended pigmented mortar includes:
 - 1. Glen-Gery Colored Mortar Blend, by Glen-Gery Corporation (484) 334-8827 in the color approved by the Architect.
 - 2. Empire Blended, (732) 269-4949 custom mix in the color approved by the Architect.
 - 3. SpecMix Portland Lime & Sand Mortar, by Spec Mix Co. (888)773-2649 in the color approved by the Architect.

Cast Iron Repair

A. Various products should be tested for their effectiveness in removing the existing paint on the cast iron railings.

- B. To fill openings in the railings, an epoxy resin binder with iron particles should be used, such as the following:
 - 1. Devcon Metal Epoxy Putty
 - 2. Locite Fixmaster Steel Putty
 - 3. Belzona 1111
 - 4. Or approved equal.
- C. Railings should be repainted with a rust-inhibiting coating and primer, such as the following:
 - 1. Tnemec Series 90-97 Tnemec-Zinc Primer and Tnemec Series 1028 Enduratone, this is preferred
 - 2. Benjamin Moore IronClad Rust Inhibitive Paint
 - 3. Or approved equal.

Wood Repair

- A. Deteriorated wood should be replaced in kind. New wood is to be tight grained and compatible. Wood is to be primed on all faces.
- B. New painted finishes for wood shall be breathable, high-quality exterior-grade acrylic coatings, such as Benjamin Moore, or approved equal. Obtain primer and finish products from the same manufacturer and verify with manufacturer that products are compatible for use in overlapping coats.

Window Sealant

A. Sealant is for use between masonry and wood frames only, to ensure weathertightness. A low-modulus elastomeric sealant should be used, such as Sikaflex-15 LM, manufactured by Sika Corporation, or approved equal.

<u>Soiling</u>

- A. Various cleaning products will be tested for their effectiveness in removing atmospheric soiling, stains and biological growth from the brownstone, sandstone, and brick.
- B. A Cleaning Test Program will be undertaken to find the gentlest yet most effective cleaning products for each material and each type of soiling. The cleaning test

program is dependent on weather and temperatures remaining about 40 degrees Fahrenheit.

MAINTENANCE PLAN*

*Maintenance plan to follow pending the approval of treatment recommendations by the LPC

Appendix A Conditions Glossary

66 West 10th Street

Abandoned Fixture



Abandoned fixtures can lead to deterioration when they corrode causing rust stains, and rust jacking with cracks and spalls in adjacent materials. Such fixtures typically include disused electrical equipment. Where abandoned fixtures penetrate wall materials, such as with recessed lighting or wall outlets, they can provide a point for water to enter the inner wall assembly. Fixtures may also be connected to thru-wall electrical conduit which provides a means for water to move within wall assemblies and, when it corrodes, can lead to cracks, spalls, and

displacement.

At 66 W 10th St, there are abandoned fixtures throughout the front and rear façades that have been installed into the brick face. On all façades, tenant cable wiring has been run through from the roof to the interior of the building by the bottom corners of the windows. These penetrations could potentially introduce water into the wall interior.

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.

There is atmospheric soiling on the underside of protruding decorative stone elements on the front façade of 66 W 10^{th} St. This soiling is also

present within the recessed areas of stone that has been carved into high relief.

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. Vines and saplings will usually damage masonry, but need to be carefully monitored because if they have become too integrated into the building removal could cause the wall to break down farther. Biological growth clogs pores, thus making it hard for water to escape and this will

also farther deterioration of masonry. Root growth can also deteriorate the mortar and cause masonry displacement.

At 66 W 10^{th} St, biological growth is present on many protruding stone elements on the front façade. There is heavy soiling on the brownstone band course along the third story, as well as on the railings of the front stoop.

Bituminous Coating



A bituminous coating is a type of coating that creates a water-proof and vapor-proof barrier. It is a mixed substance that has a viscous consistency, and can contain fiber reinforcements such as asbestos. A bituminous coating is usually applied as an inexpensive method of waterproofing in roof construction. This type of coating can cause serious deterioration of masonry as it can trap water that is absorbed by the stone. This water can then expand as a result of freeze-thaw cycles⁴, which can lead to spalling at the surface.

At 66 W 10th St, a bituminous coating has been applied to the joints of the bluestone coping on the parapet. Many of the stone window sills on the rear facades have also been coated with a bituminous coating at the corners where the sill meets the window.

⁴ 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.

Corrosion



accelerate corrosion.5

Iron and steel, when unprotected, oxidize rapidly when exposed to moisture. The oxidation of iron is a highly destructive process. The product of the oxidation is rust, which initially consists of a mixture of ferrous and ferric hydroxides, and later becomes hydrated ferric oxide (with some traces of carbonate). The minimum relative humidity necessary for rusting is 65 percent, but it can be lower in the presence of pollutants. Salts act as electrolytes that will accelerate the corrosion of iron and steel. Once a rust film occurs, its porosity can hold additional water which will also

The cast-iron railings along the front façade of 66 W 10th St have some areas of corrosion where previous coatings have failed. In one area, a post base has an opening that is the result of corrosion. In some places, the railings are corroded at the point where they meet the post, which could cause the railing to fail if untreated.

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. In general cracking can be caused by weathering, flaws in the material, rusting ferrous embedments, excessively hard repair materials, vibrations, thermal and moisture expansion and/or contraction, efflorescence, and ice formation within the material. Masonry cracks are usually caused by several different deterioration mechanisms. Stresses such as excessive sheer, compressive or tensile loads, or impact can crack masonry. Cracks in masonry are often indicators of greater structural issues. Additionally, cracks in the masonry allow water and salts to infiltrate, thereby leading to further deterioration of the material.

At 66 W 10th St, there are some hairline cracks in the stone

and brick, as well as larger cracks in areas where architectural elements meet, such as along the brick beneath a window lintel. There are also cracks along the sandstone band courses as well as in areas where previous patches have failed. These cracks must be patched in order to avoid the continued deterioration and possible spalling of large masonry units.

⁵ John G. Waite, "Part II. Deterioration and Methods of Preserving Metals," *Metals in America's Historic Buildings: Uses and Preservation Treatments*, (Washington, DC: Preservation Press, Nation Trust for Historic Preservation, 1980), 131.

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.

At 66 W 10th St, there are large areas of delamination throughout the brownstone base and stoop. This type of delamination is common in brownstone and must be patched in order to avoid further deterioration. Previous patches have delaminated or otherwise failed and are in need of replacement.



Open Joints/Failed Mortar 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, freezethaw damage, acid attack and physical movement. Once the mortar joints have failed, water can enter the masonry wall and cause additional deterioration.

Incompatible pointing material can lead to accelerated deterioration of the masonry, for example, if the open joints have been filled with

caulking material. Joints should be soft and permeable enough to allow water that enters the masonry to evaporate through the joints. If the mortar or joint material is impermeable, water can get trapped in the wall or it is forced to evaporate through the masonry units themselves. Water in the masonry units can cause freeze-thaw damage⁶. Water passing through the masonry units can result in efflorescence. Both can then lead to a physical break down of the masonry.

At 66 W 10th St, there are several open joints between segments of brownstone and sandstone on the front façade. Much of the pointing on the inner brick faces at the cellar level has failed and is in need of replacement. There are several larger areas on the rear brick façades that require

⁶ 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.

repointing. These areas are mainly along the bases of the fire escapes and just below the windows.

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.

At 66 W 10th St, there has been extensive patching done to the brownstone stoop. Many areas of patching have delaminated and need to be replaced, manly on the stair risers. Some areas of the sandstone band courses have also been patched. These patches are cracked in some areas and may lead to spalling if untreated. The previous patch repairs were not properly matched to the original stone color, and so they will need to be stained.

Spalls



Spall, or the loss of surface material, generally occurs as the result of a buildup of stresses below the surface. When the stresses become significant enough to fracture the material, pieces disengage from the body. These internal stresses may include corrosion of metallic anchors, deterioration of patches or glazing, 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.

Some spalling has occurred to the brownstone and sandstone on the front façade of 66 W 10th St, mainly at the corners and edges of carved decorative elements. These spalled areas will need to be patched and recarved to match the surrounding profile and detail of the original.

Wood deterioration



Moisture and ultraviolet radiation cause wooden window frames and sashes or other wooden elements to deteriorate. Paint minimizes the damage to wood but without proper maintenance, wood will continue to deteriorate.

At 66 W 10th St, the wooden window frames on the front façade are highly deteriorated. This is likely the result of failing paint, which has left the raw wood exposed. These elements will need to be replaced with new painted wood.