The Children's Museum of Manhattan
361 Central Park West

Special Windows Conditions Assessment
6 December 2019

fxcollaborative

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Horus Bronze - Report

CHILDREN'S MUSEUM OF MANHATTAN

361 Central Park West, New York

Special Windows Condition Assessment

Date: October 29, 2019

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1) Introduction

Horus Bronze was contracted on October 7, 2019 to join the Design Team consisting of the Children's Museum of Manhattan (Owner), FXCollaborative Architects, LLP (Architect), Li/Saltzman Architects, PC (Preservation / Landmarks Consultant) and Femenella & Associates (stained-glass Specialist) to provide a conditions assessment (CA) of the existing special windows and design-assistance on the feasibility of the replacement with better performing bronze windows or the restoration of the existing ones.
On October 14 and October 16, Horus Bronze was able to access the building on 361 Central Park West and review the existing windows. The existing windows could be surveyed from inside mostly as there was no access from outside to the windows (they could only be visually assessed from the street).

The windows being assessed are referenced by the Design Team as windows:

- 1 Ø3' 7 3/4" oculus at the upper level on South Facade
- 2 Ø3' 7 3/4" oculus at the upper level on South Facade
- 3 Ø3' 7 3/4" oculus at the upper level on South Facade
- 4 1' 7" x 4' 4" single casement at South West stair hall on South Facade
- 5 7' 5" x 22' 2" arched window at first level on South Facade
- 6 7' 5" x 22' 2" arched window at first level on South Facade
- 7 7' 5" x 22' 2" arched window at first level on South Facade
- 8 7' 8" x 10' 11" window at first level on East Facade
- 9 13' 11" x 20' 6" window at first level on East Facade
- 10 7' 8" x 10' 11" window at first level on East Facade
- 11 1' 7" x 4' 4" single casement at lower level on East Facade
- 12 1' 7" x 4' 4" single casement at lower level on East Facade
- 13 1' 7" x 4' 4" single casement at upper level on East Facade
- 14 2' 6" x 4' 5" single casement at upper level on East Facade
- 15 2' 6" x 4' 5" single casement at upper level on East Facade
- 16 2' 6" x 4' 5" single casement at upper level on East Facade
- 17 1' 7" x 4' 4" single casement at upper level on East Facade
- 18 Ø3' 7 3/4" oculus at the upper level on North Facade
- 19 Ø3' 7 3/4" oculus at the upper level on North Facade
- 20 Ø3' 7 3/4" oculus at the upper level on North Facade
- 21 1' 7" x 4' 4" single casement at North East stair hall on North Facade
- 22 7' 5" x 22' 2" arched window at first level on North Facade
- 23 7' 5" x 22' 2" arched window at first level on North Facade
- 24 7' 5" x 22' 2" arched window at first level on North Façade
- 25 7' 8" x 10' 11" window at first level on West Facade

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2) General Remarks

The windows sit into a building (a previous church of First Church of Christ Scientist) erected from 1899 to 1903 by Carrère & Hastings Architects at the corner of Central Park West and 96th Street.
The use of bronze windows at that time was extremely popular for public buildings in the New York area. Just prior to the construction of the Church, the New York Public Library was probably the first building where bronze windows of such magnitude where specified.

The interest for bronze windows was also spurred by the breakthrough extrusion process technology developed in Europe and the USA at the end of the second part of the XIX century. Only bronze could be extruded at that time.

By the beginning of the XX century when the church was built, the technology was advanced enough to produce high-profile extrusions which allowed manufacturing of technologically advanced windows such as the ones in the Church.

Extrusions used at the Building are more advanced than some used in windows of the New York Public Library. Long extrusions, straight lines, tight tolerances and fine / complex details reveal how much engineering was put into these windows.

3) Typical Notes on the Existing Bronze Windows Manufacturing

a) Typical Details

The bronze windows are all made with a similar series of extrusions resulting in similar detailing across various window types.

1. Jamb	See detail 1
2. Fixed mullion	See detail 2
3. Operable mullion	See detail 3
4. Curved operable mullion	See detail 4
5. Header:	See detail 5
6. Sill:	See detail 6

Window #9, however, has its own set of extrusions (about 5 of them) as it features unique details. These details are only surveyed from inside and need to be confirmed with a survey from outside, requiring the use of a manlift.

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7. Jamb #9	See detail 7
8. Fixed mullion #9	See detail 8
9. Header #9:	See detail 9
10. Sill #9:	See detail 10

Typically (and besides window #9), the details feature a 1” x 2” hollow bronze frame member with glass stops on both sides. The frame members are likely miter joined with brackets and splices fastened with bronze screws. This could not be confirmed during our review since glass removal would have been required.

The total frame dimension, including glass stops is 1 3/4", one exception being the curved operable mullion of oculus windows which is 2”.

Operable windows receive “split” frames composed of two hollow extrusions which are secured to overlapping shaped bronze bars (called rebates), designed to provide clearance to the windows and weatherproofing. These rebates are designed at the jambs to allow the installation of hardware (see below paragraph).
At the bottom, the rebate bars are designed to drain water out. Additionally, a drop profile is added at the bottom of operable windows to avoid accumulation of water inside the sill.

b) Glass and Glass Stop

The frame members are equipped with exterior and interior glass stop extrusions.
The exterior glass stops are secured to the frame with a series of bronze fasteners (approx. 1/8” in diameter) that are concealed within the glass rebate so they cannot be removed from outside.
The interior glass stops are fastened to the frames with a series of visible rounded head brass screws, equally spaced approximately every 10” and offset 1.5” away from corners. This mounting technique allows glazing from the inside.
Both interior and exterior glass stops have molded designs and are mitered at the corners, which enhances the profile of the windows.
The 1/4" thick glass (either clear or stained) is mechanically secured within the glass rebate provided by the exterior and interior glass stops. It is also sealed with some type of putty (likely linseed oil based , but could not be confirmed). Please refer to Femenalla report for glass purposes.

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c) Hardware

The windows are equipped with the following hardware:

1. *Bronze butt hinges* for in swinging windows. These hinges have two flanges that are very tightly inserted and mechanically secured with (3) flat head brass screws to the bronze rebates specifically machined for these hinges.

2. *Bronze cam locks*: for inswing windows. These cam locks are concealed within the bronze rebates and feature a small bronze thumb turn on the inside face of the operable frames.

3. *Surface mounted cremones* - for inswing windows. These bronze cremones are made with a rod mounted on some rotating shafts and latch the frames with a series of exposed "hooks and strikes".

4. *Pivots* - for the awning and pivoting windows. These pivots are mounted on the outside face of the frames and feature bronze overlapping shafts which provide some weather proofing.

5. *Bronze latches* for the awning and pivoting windows. These bronze latches are surface mounted.

6. *Bronze "finger" pulls* as needed

7. *Bronze casement stays.* The awning windows can be operated and maintained open with these casement stays located at the bottom of the operable frame.

d) Finishes

Currently the frames bronze windows feature typically a dark brown bronze patina on the inside and a verdigris finish on the outside. The original factory finish of these bronze frames may have been a dark bronze finish obtained by the shop-controlled application of a chemical agent on top of a cleaned bronze surface. Time, weather and layers of maintenance (proper and improper) have altered the original finish. See finish assessment below.

e) Installation

The windows appear to be secured within the masonry opening with steel brackets and anchors. The windows are installed against the inside face of the stone from the façade. Mortar sealant seals the window to the stone.

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4) Technical Assessment of the Existing Windows

For windows that are more than 100-years old left with little or no maintenance, it is remarkable how long they have served the building. Manufacturing details are still astonishing and some mechanisms remain perfectly functioning. Interior and exterior finishes could likely be restored to their factory finish without issue. From a conservationist point of view, many of the bronze windows are generally in good to fair condition.

But if we evaluate the windows against current technical standards and performance requirements, the special windows of the Building are in poor conditions and should be replaced or fully restored.

The main concerns that arise from the window condition assessment are:

a) Most of the operable frames do not close and latch properly for various reasons: some distortion of the frame members, sagging of the frames and worn or broken hardware. This leads to unacceptable air and water infiltration that ultimately results in deterioration of the building.

b) Ferrous corrosion has developed at numerous locations. This corrosion is concerning because it's likely coming from the wrought iron or steel components used to secure the windows to the masonry or reinforce / splice some of the profiles.

c) The exterior finish on the frame has not been maintained for years if not decades. The bronze has corroded at some locations beyond the point of verdigris and started to deteriorate the frame itself.

d) A concerning amount of bronze members at the mullions (especially at the large arched windows 5, 6, 7, 22, 23, 24) have split in two. This could be due to some corrosion and the fact that these members appear to have been "welded" together to create a hollow profile. The weld seams have cracked, creating infiltration issues and structural issues.

e) Some frame junctions (spliced or mitered) have separated, structurally jeopardizing the frames and will likely worsen over time.

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Please refer to the attached schedule, for additional information.

5) Assessment of the Existing Windows From the Point of View of the Building Use

a) Thermal Assessment
The windows are made with non-thermally broken profiles, glazed with monolithic 1/4" to 3/8" thick glass and feature numerous operable sections that do not close properly which let air and water through.

These windows were likely suitable for 100 years when interior air control was not critical and building use was limited. In their current state, the windows cannot properly serve the proposed use of the building with controlled air.

During cold weather periods, when the interior air temperature will be maintained around 70F and relative humidity around 40%, the inside face of the windows will sweat and likely freeze if nothing is done to improve thermal performance. This would result in uncontrolled water infiltration on the inside, risking damage to finishes. Additionally, if left unchanged, the existing windows will allow large thermal losses that cannot be mitigated by the new HVAC system, which in turn results in wasted energy and unnecessary costs.

b) Structural Assessment.
The existing windows do not meet current structural load requirements. Significant deflections at mid-span of the large windows is already evident by pushing the windows out. This lack of stiffness may be an issue for the installation of new and/or stained glass given the lack of proper support. Additionally, there are potential safety concerns as the existing window frames would not sustain applicable loads.

c) Security Assessment
The windows are not secured. Most of the operable panels have defective hardware. The operable panels are easily opened from the outside. The operable windows and hardware should be fixed and/or replaced.

d) Value Assessment
The windows are deteriorating (corrosion) and deterioration will continue if nothing is done to remediate, resulting in potential losses.

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6) Preliminary Notes about the Restoration Option

The restoration of the existing bronze windows will require focus on:

a) Structural

1. Secure all frame cracked and weakened members by repairing or replacing sections with matching frames.
2. Reinforce the main members with additional transom or frames.
3. Replace all corroded iron fastening brackets and splices with new stainless-steel brackets and splices.

b) Operable Frames

It is our understanding that the project proposes all special windows to become fixed. This may simplify the repair or render hardware replacement unnecessary. Regardless, squaring out all malfunctioning operable vents, securing them with additional brackets or frames into the window frames and sealing all reveals would be required.

c) Glazing

It is our understanding that the Design Team proposes to replace all stained glass with clear glass for better performance. This will involve disassembling all glazing stops, clean out the rebates, installation of new glass such as vacuum glass (provided that the existing rebate is acceptable by manufacturer) and resealing.

d) Corroded Locations

At all locations where corrosion from the internal iron splices or brackets has developed on the outside, the frames will need to be cut approximately 5" away on both sides of the efflorescence and replaced with new spliced matching sections.

e) Finishes

Pending Design Team direction, the interior and exterior surfaces may need to be entirely stripped down and refinished to factory finish or just cleaned and maintained. Both solutions will require substantial interventions.

For such restoration, it will be important to consider and assess if the existing windows will be taken down or restored in place.
We believe taking the windows down would jeopardize the windows integrity and we would not recommend it. This means that, beside of the new glass stop frames and the restoration of the operable frame (square out and hardware removal), most of the work will be down on site,

requiring substantial and long interventions with scaffolding and protection.
It is difficult to achieve high quality work of the types described above in the field.

7) Preliminary Notes about the Replacement Option

The replacement of the existing bronze windows will incorporate the following objectives:

a) Create custom thermally broken bronze frames with detailing to closely match the existing window detailing for LPC approval.

b) Provide relevant and satisfactory thermal and weather proofing performance.

c) Meet all current codes and requirements.

d) Provide appropriate glazing rebates based on approved glazing assembly.

e) Provide satisfactory bronze finishes and details that meet or exceed the high standards of the existing windows and building.

f) Minimize installation and intervention on site.

g) Minimize future maintenance.

h) Fit within a budget.

All objectives, including others to be specified by Design Team, seem feasible with proper design phases and engineering.

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Horus Bronze - Matrix

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Special Window Condition Assessment Matrix
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WINDOW REF #:	**1** (picture #30)
SIZE:	Diameter 7'-6 3/8"
LOCATION:	South façade, second floor
OPERATION:	Pivoting panel
QTY OF LITES :	(16) lites of clear glass
CONDITIONS ASSESSMENT:	Window is generally in a fair condition and glass is not damaged. Frame is cracked at some joins locations and internal corrosion develops Abnormal build up of verdigris can be noticed at interior perimeter Glass is improperly cut, and edges are visible (picture 32) Pivoting windows cannot be closed and is maintained with a rope. (picture 31) Missing latching hardware

WINDOW REF #:	**2** (picture # 29)
SIZE:	7'-6 3/8"
LOCATION:	South façade, second floor
OPERATION:	Pivoting panel
QTY OF LITES :	(16) lites of clear glass
CONDITIONS ASSESSMENT:	Window is generally in a fair condition (2) pieces of glass are damaged (dents) No apparent cracks on the frames Pivot is broken Abnormal build up of verdigris can be noticed at interior perimeter Corrosion develops on the outside, closed to the stone

WINDOW REF #:	**3** (picture #28)
SIZE:	7'-6 3/8"
LOCATION:	South façade, second floor
OPERATION:	Pivoting panel
QTY OF LITES :	(16) lites of clear glass
CONDITIONS ASSESSMENT:	Window is generally in a fair condition Center glass panel was changed and sealed improperly (picture 26) Operable panel swing improperly Frame is cracked (picture 25) Corrosion development in the outside (picture 27)

WINDOW REF #:	**4** (pictures 36-37)
SIZE:	4'-11 7/8"x 2'
LOCATION:	South façade, first floor
OPERATION:	Single casement
QTY OF LITES :	(11) lites including (10) stained glass and (1) textured clear glass at center
CONDITIONS ASSESSMENT:	Window is generally in a fair condition Pivoting panel was made fixed Latch at bottom no longer functional No apparent cracks in frame Some joins seems to give a little and open up Frame shown signs of corrosion at the bottom. Hinge show sign of fatigue of the astragal

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WINDOW REF #:	**5** (picture 60)
SIZE:	23'-3 5/8" X 7'-6"
LOCATION:	South façade, first floor
OPERATION:	(2) pivot panels
QTY OF LITES :	(60) lites of stained glass
CONDITIONS ASSESSMENT:	Window is generally in a poor condition Upper window does not close properly. Frame is not squared. Temporary brackets were installed to maintain the window locked Window is subject to deflection Missing screws at several location, especially at glass stops Abnormal build up of verdigris can be noticed at interior perimeter

WINDOW REF #:	**6** (picture 61)
SIZE:	23'-3 5/8" X 7'-6"
LOCATION:	South façade, first floor
OPERATION:	(2) pivot panels
QTY OF LITES :	(60) lites of stained glass
CONDITIONS ASSESSMENT:	Window is generally in a poor condition window operates but does not close properly Latch is broken. Missing glass top (picture 41) Window is subject to deflection Operable window was siliconed to prevent leaks (picture 43) Mullions are cracked at several locations. (picture 44,45,46)

WINDOW REF #:	**7** (picture # 62)
SIZE:	23'-3 5/8" X 7'-6"
LOCATION:	South façade, first floor
OPERATION:	(2) pivot panels
QTY OF LITES :	(60) lites of stained glass
CONDITIONS ASSESSMENT:	Window is generally in a poor condition Operable window does not close entirely and is not locking Missing casement stay Window is subject to deflection Mullions are cracked at several locations

WINDOW REF #:	**8** (picture # 49)
SIZE:	11'-1"x 7'-9 5/8"
LOCATION:	East façade, first floor
OPERATION:	Pivoting window
QTY OF LITES :	(33) lites of stained and textured glass
CONDITIONS ASSESSMENT:	Window is generally in a poor condition Window is not operable. Latch is broken Operable window was sealed at a later date Missing glass stop Open mitered joints at several locations. Window is subject to deflection

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WINDOW REF #:	**9** (picture # 51)
SIZE:	19'-4 1/4"x11'-6 3/4"
LOCATION:	East - first floor
OPERATION:	Fixed
QTY OF LITES :	(3) large stained glass panels with divisions
CONDITIONS ASSESSMENT:	Window is generally in a fair condition Include details that are unique to these windows due to size. Glass-stop on the bottom is pushed out by some internal corrosion. (picture 52-53) Mitered joints up at several location creating excess of verdigris Header and exterior details cannot be review at this time

WINDOW REF #:	**10** (picture # 54)
SIZE:	11'-1"x 7'-9 5/8"
LOCATION:	East - first floor
OPERATION:	Pivoting window
QTY OF LITES :	(33) lites of stained and textured glass
CONDITIONS ASSESSMENT:	Window is generally in a fair condition Operable window is not operable. Latch is broken Operable window was sealed Missing glass stop. Open mitered joints at several location Window is subject to deflection

WINDOW REF #:	**11** (picture # 66)
SIZE:	4'-11 7/8"x 2'
LOCATION:	East façade, first floor
OPERATION:	Fixed window
QTY OF LITES :	(11) lites, clear
CONDITIONS ASSESSMENT:	Frame is in relatively good conditions A second glass was installed on the inside Glass in center panel is broken. (picture 55)

WINDOW REF #:	**12** (Picture # 56)
SIZE:	5'-2"x 2'-2"
LOCATION:	East façade, first floor
OPERATION:	Fixed window
QTY OF LITES :	(11) lites, clear
CONDITIONS ASSESSMENT:	Seems to be in a fair condition but no access (1) glass is broken

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WINDOW REF #:	**13**
SIZE:	5'-2"x 2'-2"
LOCATION:	East facade, second floor
OPERATION:	Fixed
QTY OF LITES :	(12) glass lites
CONDITIONS ASSESSMENT:	No access, Could not be reviewed

WINDOW REF #:	**14** (picture # 16)
SIZE:	4'-6" x 2'-6"
LOCATION:	East facade, second floor
OPERATION:	Casement
QTY OF LITES :	(11) glass lites, clear
CONDITIONS ASSESSMENT:	Frame is in relatively poor conditions Plexiglass instead of operable panel The operable panel was removed Frame is cracked (picture 17) Poor mitered connection detail (picture 18)

WINDOW REF #:	**15** (picture # 19)
SIZE:	4'-6"x2'-6"
LOCATION:	East facade, second floor
OPERATION:	Casement
QTY OF LITES :	(11) glass lites, clear
CONDITIONS ASSESSMENT:	Frame is in relatively poor conditions Missing pieces of hardware Operable panel can be open, but hinges miss fasteners (PICTURE 21) Cremone and latches in poor condition cannot be operated No apparent cracks Some glass tops screws are missing Glass tops at top of operable panel is missing. (PICTURE 22)

WINDOW REF #:	**16** (picture # 23)
SIZE:	4'-6"x2'-6"
LOCATION:	East facade, second floor
OPERATION:	Casement
QTY OF LITES :	(11) glass lites, clear
CONDITIONS ASSESSMENT:	Frame is in relatively poor condition Cremone mechanism in good conditions but latch is not.(PICTURE 23) Hinges are broken. (PICTURE 24) Missing screws Operable panel cannot be fully closed No apparent cracks Glass sealant is very dry

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WINDOW REF #:	**17** (picture # 15)
SIZE:	5'-2"x 2'-2"
LOCATION:	East facade, second floor
OPERATION:	Fixed
QTY OF LITES :	(12) glass lites
CONDITIONS ASSESSMENT:	No access, Could not be reviewed No access lack of do to shaft We notice shattered glass at the seal but not missing glass

WINDOW REF #:	**18** (picture # 1)
SIZE:	7'-6 3/8"
LOCATION:	North Façade, Second floor
OPERATION:	Pivots
QTY OF LITES :	(16) lites of clear glass
CONDITIONS ASSESSMENT:	Frame is in relatively good condition The window was sealed No gaskets round oculus perimeter. Exterior glass sealant in dry conditions Interior finish shows some damage of water infiltration Interior finish was redone

WINDOW REF #:	**19** (picture # 7)
SIZE:	7'-6 3/8"
LOCATION:	North Façade, Second floor
OPERATION:	Pivots
QTY OF LITES :	(16) lites of clear glass
CONDITIONS ASSESSMENT:	Frame is in relatively fair condition Access was limited at the time of survey Operable frame is not latched, same command that window 18 Cannot be locked (closed) Do to interior astragal been damage at pivot (PICTURE 8)

WINDOW REF #:	**20** (picture # 13)
SIZE:	7'-6 3/8"
LOCATION:	North Façade, Second floor
OPERATION:	Pivots
QTY OF LITES :	(16) lites of clear glass
CONDITIONS ASSESSMENT:	Frame is in good conditions window is not locked Glass sealant looks dry Build up verdigris metal corrosion at interior finish. (Picture 14)

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WINDOW REF #:	**21** (picture #25)
SIZE:	4'-11 7/8"x 2"
LOCATION:	North Façade, Second floor
OPERATION:	Casements
QTY OF LITES :	(11) lites of clear glass
CONDITIONS ASSESSMENT:	Window is in good conditions Hinges in good conditions Latches are Brocken (1) piece of glass is broken

WINDOW REF #:	**22**
SIZE:	23'-3 5/8"x 7'-6"
LOCATION:	North Façade, first floor
OPERATION:	Pivoting window
QTY OF LITES :	(33) lites of stained and textured glass
CONDITIONS ASSESSMENT:	Window is generally in a poor condition Upper window doesn't close properly Frames and glass tops in poor conditions with visible cracks

WINDOW REF:	**23**
SIZE:	23'-3 5/8"x 7'-6"
LOCATION:	North Façade, first floor
OPERATION:	Pivoting window
QTY OF LITES :	(33) lites of stained and textured glass
CONDITIONS ASSESSMENT:	Window is generally in a poor condition Upper window doesn't close properly Frames and glass stops in poor conditions with visible cracks

WINDOW REF #:	**24**
SIZE:	23'-3 5/8"x 7'-6"
LOCATION:	North Façade, first floor
OPERATION:	Pivoting window
QTY OF LITES :	(33) lites of stained and textured glass
CONDITIONS ASSESSMENT:	Window is generally in a poor condition Upper window doesn't close properly Frames and glass stops in poor conditions with visible cracks Temporary bracket to lock as latch is broken

WINDOW REF:	**25** (picture # 39)
SIZE:	10'-11 3/8" x 7'-9"
LOCATION:	WEST FIRST FLOOR
OPERATION:	CASEMENT
QTY OF LITES :	(31) lites including stained and texture glass
CONDITIONS ASSESSMENT:	Window is generally in a good condition window can be operated but cannot be closed and latch. Exterior stained glass very damaged No apparent cracks Frame and glass stops in apparent good conditions.

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Pictures

Picture 1

Picture 7

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Picture 8

Picture 13

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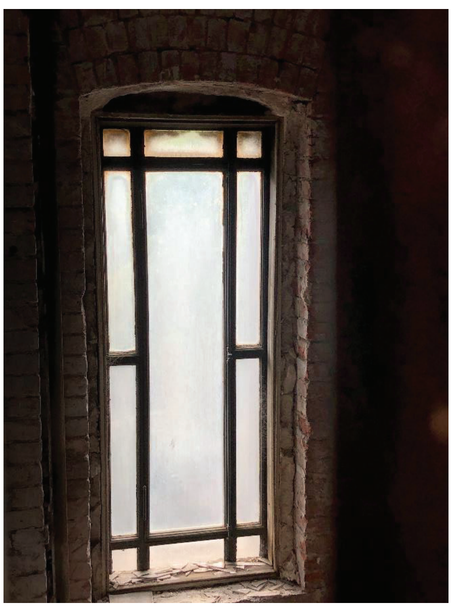
Picture 14



Picture 15

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Picture 16

Picture 17

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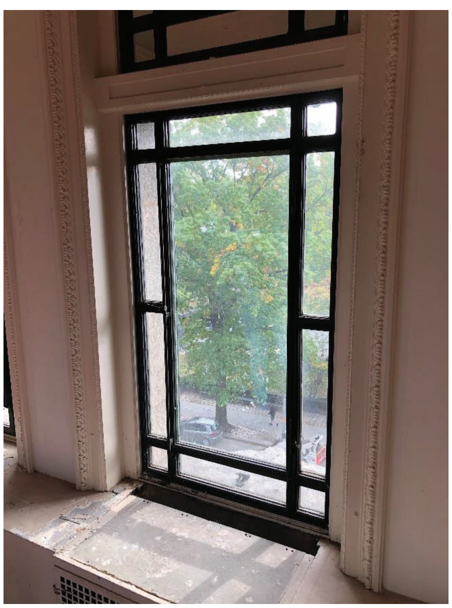
Picture 18



Picture 19

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Picture 21

Picture 22

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Picture 23

Picture 24

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Picture 25


Picture 26

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Picture 27

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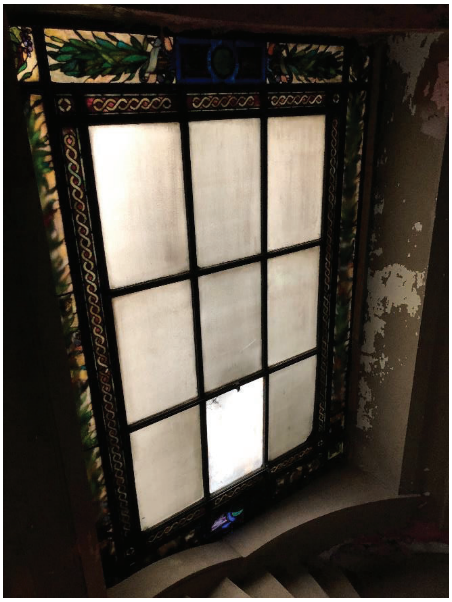
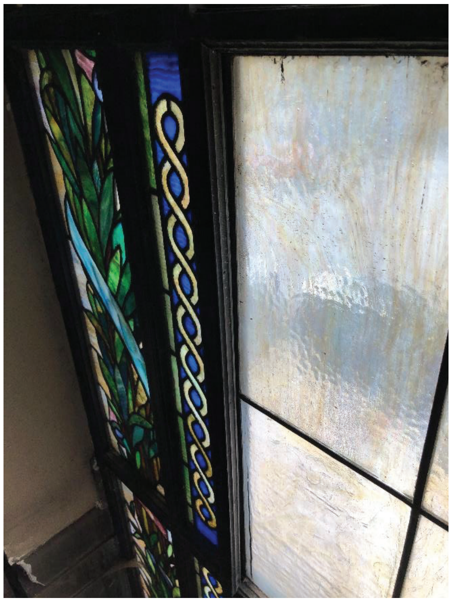
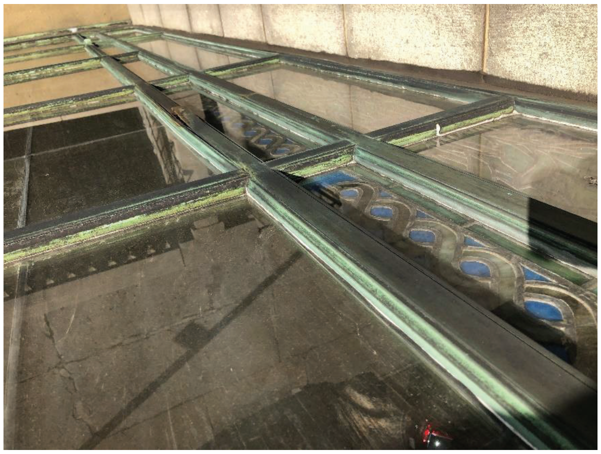

Picture 39


Picture 41

HORUS BRONZE
175 VAN DYKE STREET BROOKLYN NY 11231
www.horus-bronze.com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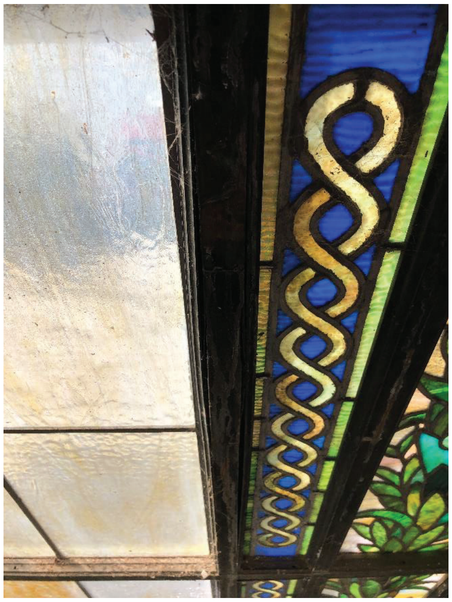
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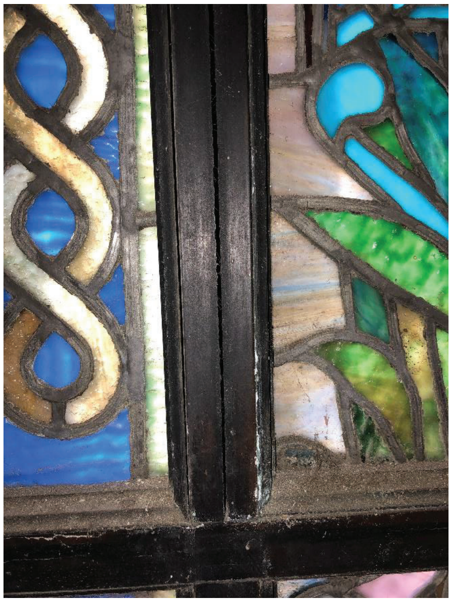

Picture 45

Picture 46

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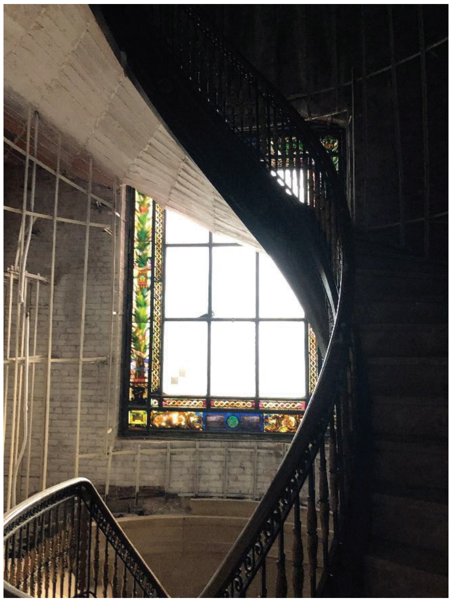

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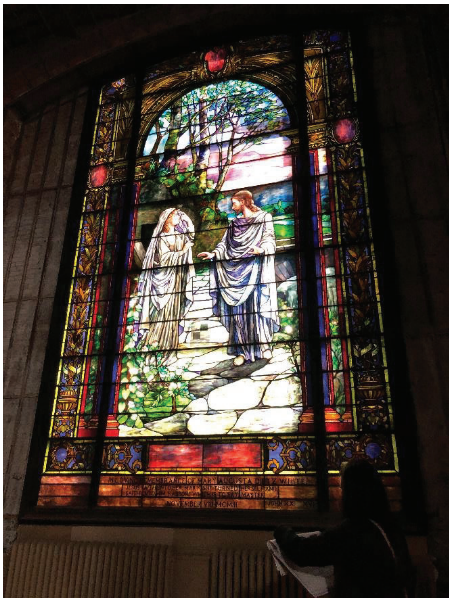

Picture 51

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Picture 52

Picture 53

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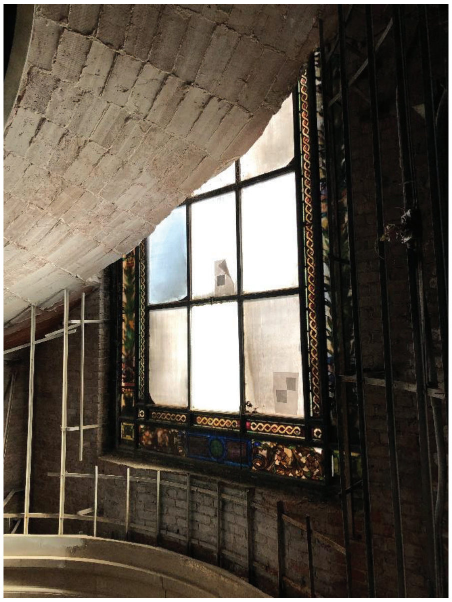

Picture 54

Picture 55

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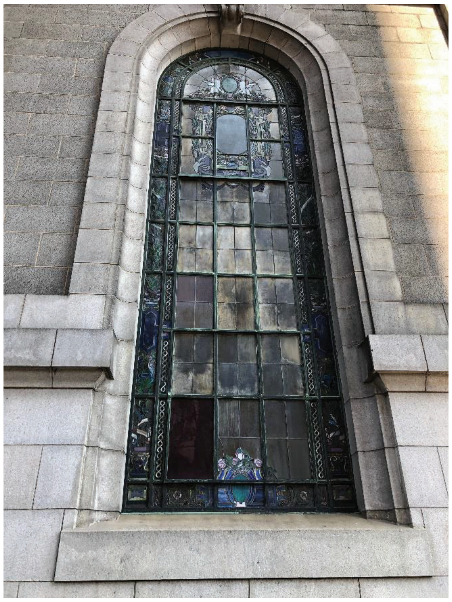
Picture 56



Picture 60

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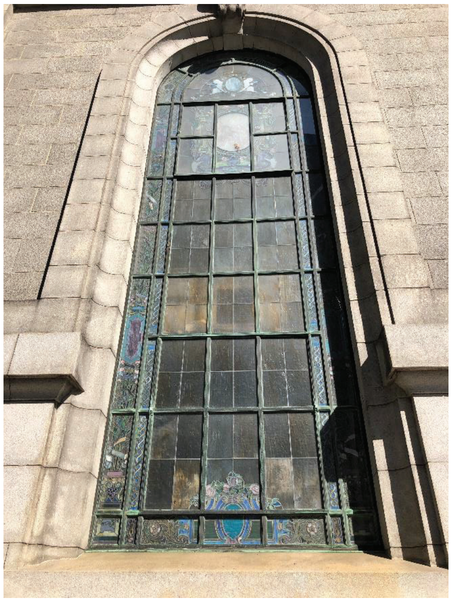

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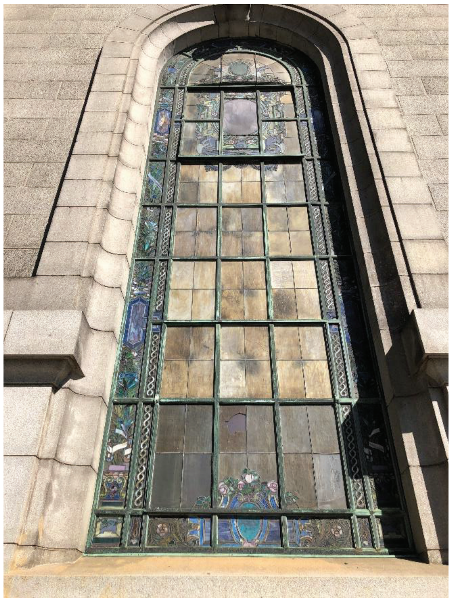

Picture 62

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Femenella & Associates - Report

FEMENELLA & ASSOCIATES, INC.

STAINED GLASS CONSERVATION ◊ WOOD WINDOW RESTORATION ◊ STEEL WINDOW RESTORATION

Children's Museum of Manhattan (CMOM) Building
361 CPW – NYC, NY

SPECIAL WINDOWS CONDITIONS ASSESSMENT (STAINED GLASS)

INTRODUCTION

Femenella & Associates, Inc (F&A) was asked by FXCollaborative Architects LLP, herein the "Architect" to conduct a conditions assessment of the stained and leaded glass windows at 361 CPW in New York, NY, herein the "Building".

PROCEDURE

F&A visited the Building and inspected the various conditions. The windows were photographed in digital format. These findings have been incorporated into this report.

THE STAINED GLASS WINDOWS

The Building's stained glass windows are all from the opalescent school of design. They can be divided into two styles: 1) purely ornamental and 2) figurative, or medallion windows surrounded by opalescent school decorative elements. The large window in the east façade is purely figurative and the many of the windows on the sides of the Building have medallions set within the decorative glass work, some of which depict figural scenes while the others are purely decorative. The medallions are surrounded and woven into the whole with a series of borders and shimmering pieces of glass.

These design styles were started in the United States. Opalescent glass as used in stained glass windows is an American invention, whose origins date to circa 1874 and the glass work of John La Farge. Opalescent glass existed prior to 1874 but was primarily used for perfume bottles and curios. La Farge was the first to use opalescent glass in windows. Tiffany and then many others were soon to follow.

It is not exactly clear who designed the Building's stained glass windows, but all contracts extant point to the fabrication of these windows by the Decorative Stained Glass Company of New York. That company was founded by Thomas Wright and John Calvin, and at that time, was located at 45 Washington Square South, NYC, and later at 152 W. 21st Street. The firm fabricated their own designs and the work of many other notable artists including John La Farge.

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According to Charles Yarnall's John La Farge: A Biographical and Critical Study (2012), the La Farge Decorative Art Company, was incorporated in October 1883, but that four of its employees, including Wright and Calvin, quit during the incorporation process that same month to form the Decorative Stained Glass Company. The Decorative Stained Glass Company made opalescent windows on contract for La Farge, Maitland Armstrong, Mary Tillinghast, Joseph Lauber, Frederick Wilson, possibly Herman T. Schladermundt, and other artists. "Joined by two partners and several key assistants, Wright and Calvin set up shop on West 4th Street just off Washington Square. The company produced windows for many designers, including partners in the firm. As a result, windows by other artists after 1885 often share technical features and glasses with windows by La Farge, leading to attribution "disputes".

SETTING

All the windows are set into well-made but deteriorating bronze frames. The glass is set and retained with bronze moldings and hard setting putties. The actual panel size is quite small, and it does not appear as though external support bars were used, except for the large front window. The side windows all had operating ventilators, or opening windows, mainly of the center pivot design. The large front window has traditional, round saddle bars that extend across the window. These are connected to the window with copper tie wires that have been soldered onto the lead came matrix.

GLASS PALETTE

The opalescent windows are fabricated from a rich and varied palette of 1) opalescent, 2) mottled, 3) rolled, 4) patterned and 5) mouth blown glass. There are also highlights of 6) hand spun rondels and 7) pressed glass jewels throughout the windows.

(I tried numbering paragraphs; fine with me but couldn't get it to work. First two paragraphs are for opalescent glass, balance slf-explanatory))

Opalescent glass is a generalized term for clear and semi-opaque pressed, cloudy, or marbled glass that is sometimes accented with subtle coloring, all combining to form a milky opalescence in the glass. American glassmakers transformed European stained glass that had been used in cathedrals into the translucent milky glass that we now refer to as opalescent glass. John LaFarge and L. C. Tiffany were two American artists who first experimented with opalescent effects, driven by their desire to create beautiful visual scenes in glass without painting. Opalescent glass was first developed and patented by John Lafarge circa 1879, but it was Tiffany who created the masterworks in glass for which he is still so well known today. Tiffany created totally new colors in glass, new types of glass unparalleled in depth and coloration, and used glass in new forms that evoked the forms of nature.

The opalescent effect is a glassmaking technique used by many manufacturers (with greater or lesser degrees of artistry) that is produced during the cooling process, which creates the milky opalescent effect that illuminates any coloration when light shines on it. Sometimes the opalescent effect was created along the edge of a piece, often coupled with wavy effects that made for an elegant yet subtle look. Opalescence was also created during glassmaking by alternating heating and cooling of the glass, with addition of chemical additives to create the desired effect. There was also a type of opalescent glass that was made in layers; again, the heating and re-heating process was used with the addition of chemical agents to create the opalescent effect. The degree and location of the opalescence was controlled (as such) by the glassmaking process, and by the thickness of the glass itself.

Mottled glass is usually opalescent in manufacture, with the amount of opalescence varied throughout the sheet. Mottled glass has a slightly rougher texture and is often referred to as *cat's paw glass* because the variation in opalescence often look like a cat walked across the glass, leaving lighter spots in its wake.

Rolled (or cast) glass is a translucent glass with 50-80% light transmission, depending on its thickness and type of surface. It is used where transparency of the glass sheet is not important or not desired. To produce rolled glass, molten glass pours from the melting tank over a refractory barrier (the "weir") and onto the machine slab, where it flows under a refractory gate (the "tweel") that regulates the volume of glass, and then between two water-cooled rollers. The distance between the rollers determines the thickness of the glass. Often, one or more of the rollers has a texture on its surface that imparts a texture to the finished glass.

Patterned glass us usually a form of rolled glass but can also be made from opalescent glass. In patterned glass, a distinct patter is applied to one or both of the rollers that the molten glass is passed through. As the glass is soft at this point, the pattern from the rollers is imparted onto the glass.

Mouth-blown or antique glass can be found in the windows as well. To fabricate the glass, a large blob of molten glass is held on the end of a long hollow metal tube. The glassworker then blows air into the blob to form a small bubble. The glass is repeatedly re-heated and more air blown in until the glass has formed a bubble perhaps two feet long. The glassworker then cuts off the ends of the bubble, leaving a cylinder. The cylinder is then cut lengthways and the glass is unfolded to form a sheet. This is all done while the glass is very hot. It is a slow and highly skilled job. The sheet of glass must then be cooled in a controlled way so as not to introduce cooling stresses into the glass. The final sheet may be a few square feet in size.

(Removed bit about spun rondels, investigating photos, no rondels)

Pressed jewels in various colors are also present in the windows. The jewels may be round or pyramid shaped. They are formed by compressing newly molten glass between either a steel or wetted wood press.

SUPPORTING MATRIX

The predominant matrix throughout the windows is one of lead came. Lead came has been used to make stained glass windows for over a millennium. The came has an "H" like profile. The glass is inserted into either side. The cames are cut to fit and soldered together where they meet.

Saddle bars and copper tie wires are used to give needed support to the lead came matrices, only in the front window. This is also a thousand-year-old technique. Tinned copper wires are soldered onto the joint formed by two or leads coming together, that lie on the line that the craftsman has determined need a support bar. Upon installation, the round saddle bar is firmly inserted into the supporting frame of the window. The stained glass is set against the saddle bars and the copper tie wires are pulled tightly around the bar, twisted, cut to a uniform length and folded over the bar. These bars provide resistance to lateral movement and are not intended to support the weight of the panels. The balance of the panels in the rest of the windows are small and supported by the bronze frames.

There are some flat bars that have been soldered directly to the window. These appear to be from past repair/restoration attempts and not original to the windows. These are flat steel bars that have been coated with a thin layer of galvanizing, either hot-dipped or electro-plated. The bars are soldered directly onto the lead came matrix at the intersection of two or more lead cames, many are soldered onto the exterior.

SPECIAL TECHNIQUES

A design device used in these windows is the technique of *plating*. (See attached sketches "Structure 1" & "Structure 2"). Plating is the mechanical layering of two or more pieces of glass to achieve a desired artistic affect. The multiple layers can be of different shapes and are usually different colors and textures. That is why these windows look different in the evening when one only sees the reflected color from the inner surface of the window and not the transmitted color of the various layers. F&A have worked on windows were the plating was seven layers thick. In the windows of the Building, the plating appears to be minimal; 2 to 3 layers at most. Plated windows can be extremely difficult to work on and should be restored only by craftsmen with extensive experience with this technique.

There is some glass painting in the windows. This appears to be limited to the figural scenes within the medallions and on the large east figural window. The painting style is very sophisticated, and the rendering is well done. The paint is made of ground glass, metallic oxide coloring agents and a flux to lower the melting temperature. It is applied to the interior surface of the glass via one or more media (i.e. gum Arabic and water, oil, alcohol, etc.). After drying and manipulation of the paint by the artist with stiff brushes and/or wood picks, the glass is fired in a kiln between 1050° F and 1250° F depending on the chemical nature of the paint and the glass.

There may be some use of silver stain, but this was difficult to ascertain from the floor. Silver stain is a mixture of silver nitrate, gum gamboge and a flux. It is applied to the exterior of the glass and fired at 1150° F to 1250° F. The stain penetrates the surface of the glass, imparting a stain to it that may range from pale amber to deep orange. The final color of the stain is dependent upon the chemistry of the stain, the chemistry of the glass, the amount of stain applied and the temperature to which it is fired.

PROTECTIVE GLAZING

There is only protective glazing installed on the large east figural window. This appears to be glass and probably dates to when this window was fabricated. None of the arched side windows have any protective glazing.

GENERAL CONDITIONS FOUND

The windows in the Building range from very poor to fair condition. The actual condition of each window is determined by location, age, size and vandalism. The following general types of deterioration were found during this inspection of the windows.

DEFLECTION

Deflection is the bowing and bending of the individual leaded panels away from their original, flat design plane. Contrary to common belief, gravity and wind loading play minor roles in the deflection of stained-glass windows. The primary cause is the force generated by the expansion / contraction cycle. This force is distributed throughout the window as a function of the concentration of lead cames present in an area and the temperature differential that the window experiences. The exact portion of the window that deflects is a function of the strength of the local force exerted, and the ability of that area of the window to resist deflection. The ability of the window to resist deflection is determined by many factors, including but not limited to the following:

1. Pattern of the lead lines. Weak patterns are - straight lines that form hinge joints allowing the panel to fold; concentric circles allow the focus of the circles to telescope in or out; multiple, thin borders allow the panel to fold.

2. Insufficient or poorly applied support bars and the size of the panels. The larger the size, the greater the forces that act on the window.

3. The panel fitting too tightly into its frame. This inhibits the ability of the panel to expand and contract within a flat plane.

4. The use of hard setting sealant compounds. This inhibits the ability of the panel to expand within a flat plane.

5. The use of a soft alloy to fabricate the lead cames. These are more subject to bending than alloys containing .6 - .9% tin and antimony.

The force generated by the expansion/contraction cycle and resisted by the stained-glass windows set too tightly into their frames, has adversely affected some of the larger stained-glass

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panels. This is primarily a function of the incorrect setting of the protective glazing, the rigid setting of the stained glass, design weaknesses inherent in the windows, the corrosion and metal fatigue of the lead cames and the effects of time.

SOLARIZATION

Solarization refers to a phenomenon in physics where a material undergoes a temporary change in color after being subjected to high-energy electromagnetic radiation, such as ultraviolet light or X-rays. Clear glass and many plastics will turn amber, green or other colors when subjected to X-radiation, and glass may turn blue after long-term solar exposure in the desert. It is believed that solarization is caused by the formation of internal defects, called color centers, which selectively absorb portions of the visible light spectrum. In glass, color center absorption can often be reversed by heating the glass to high temperatures to restore the glass to its initial transparent state. Solarization may also permanently degrade a material's physical or mechanical properties, and is one of the mechanisms involved in the breakdown of plastics within the environment

Certain types of colorless, transparent glasses, when exposed to sunlight for extended periods of time, develop a pink or violet color. Bottles, insulators, and fragments having this color are often called "desert glass", but the scientist prefers the term "solarized glass". Other well-known examples are the famous purplish windows on Beacon St. in Boston and the little circular glass disks in older sidewalks. Occasional examples are also found in the ancient world. Most, if not all, of the internal plating (yes, that pebbled glass was intended to be on the interior) has turned purple due to solarization. If the glass is removed from the leads, one will see an edge of clear glass that was not subject to the UV rays.

The major constituent of most glasses is silica, which is usually introduced as a raw material in the form of sand. Although silica itself is colorless, most sands contain iron as an impurity which imparts a greenish color to the glass. (In ancient times glassmakers used very impure sands, with higher iron contents than those of sands used today, so most ancient glasses have a more pronounced greenish color.) By adding certain other ingredients to the molten glass, it is possible to offset this greenish color and produce water-white glasses. Such ingredients are known as decolorizers and one of the most common is manganese dioxide (MnO_2). In chemical terms, the manganese acts as an oxidizing agent and converts the iron from its reduced state (which has a strong greenish-blue color) to an oxidized state (which has a yellowish but much less intense color). In the course of the chemical reaction, the manganese goes into a chemically reduced state which is virtually colorless.

Manganese is believed to have been first used as a decolorizer as early as about the 2nd century B.C. It was probably introduced as the mineral pyrolusite. From Roman times onward, glasses often contained about 0.5 to 1.0% MnO_2. Later, manganese dioxide was sometimes called "glassmaker's soap". If pieces of colorless glass containing reduced manganese are exposed to ultraviolet light for long periods of time, the manganese may become photo oxidized. This converts it back into an oxidized form which, even in rather low concentrations imparts a pink or violet color to glass. The ultraviolet rays of the sun can promote this process over a matter of a few years or decades, thus accounting for the color of desert glass. Variations in hue and intensity are caused by variations of chemical composition and conditions of exposure. The effect has been reproduced under laboratory conditions.

Other chemical elements which are subject to photo-oxidation may also undergo color changes when exposed to ultraviolet light. Since about the turn of the century, some of these, such as selenium and cerium, were occasionally used as decolorizers and therefore can produce polarization colors, just as manganese does. The colors developed by these two elements are said to range from yellow to amber.

BROKEN GLASS

There is incidence of cracked or broken glass throughout the windows. The breaks are caused by:

1. Deflection. The window bends beyond the tensile strength of the glass. Long, thin pieces and complex concave shaped pieces tend to be the first to break.

2. Rapid deceleration. When the ventilators are slammed shut, strong forces are exerted on the panel, breaking the weaker pieces.

3. Impact. Most of the broken glass is the result of impact, and directly, that of vandalism.

DIRT

There is an accretion of dirt on all surfaces of the glass. This is a combination of soot from the furnace (even if the present system is clean-burning, it is unlikely that previous systems were as clean), candle smoke and other air-borne contaminants (including hydro-carbon pollution from the surrounding industrial area). This layer of dirt may become hygroscopic, absorbing water and holding it close to the glass. This can be very detrimental to the painted glass. This presents a threat to the physical stability of the glass and interferes with the esthetic appreciation of the windows. As stated before, some of the windows have two or three layers of plating. The dirt gets in between the plates.

QUALITY OF LEAD CAME ALLOY

There is evidence that a weak alloy of lead was used to fabricate the lead cames of most of the windows. This was typical in windows made from this period and dating back to the early 19th century when developments in the refining process allowed for the fabrication of pure lead cames. Unfortunately, many of the "impurities" that were removed from the lead made an alloy that was stronger, and more resistant to fatigue damage, as well as deflection. This original design flaw should be addressed during any restoration project.

METAL FATIGUE

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Leaded glass windows are designed to flex and move when subject to the stresses of wind loads and the effects of expansion and contraction. This constant flexing of the lead came matrix results in failure due to metal fatigue over long periods of time. The evidence of this failure can be seen with close inspection of the lead cames. Broken solder joints and small cracks in the lead came develop. The broken solder joints are not serious and can be repaired. The cracks in the lead came are more serious and evince the need for replacement of the lead cames. Both broken solder joints and cracked leads can be seen throughout the windows of the Building. The addition of trace amounts of copper and/or silver to the lead alloy used for the cames would greatly magnify the lead cames resistance to metal fatigue if a restoration option is pursued.

LEAD CORROSION

Lead corrodes when exposed to various chemicals in the environment. The typical type of corrosion is from inorganic acids in the air. This results in a dark patina that forms on the surface of the lead and is self-sealing, preventing corrosion of the metal below the surface. A second and more damaging type of corrosion is caused by attack from organic acids. This results in a white powder (lead carbonate) to form on the surface of the lead cames. This type of corrosion is not self-sealing. Some of the windows of the Building have extensive lead carbonate deposits on the exterior surface of the lead cames. This is likely due to use of improper, organic acid releasing caulks. Carbon dioxide present in the air, dissolves into the water formed in the humid environment that forms around the panels. When this occurs in the presence of small amounts of acetic or other organic acids, a process begins that results in the extensive corrosion of the lead came matrix. The only solution to this problem is to alter the micro-environment that encourages the corrosion.

FAILURE OF THE LEAD CAME MATRIX

Due primarily to the three previous types of deterioration, the lead came matrices on some of the windows are beginning to fail. The lead is separating from the glass and daylight can be seen coming through the window. This is most serious in windows 5 &7. They get more of the weather and have been subject to vandalism.

GLASS PAINT

For the most part, the glass paint appears sound. However, there are limited passages in the windows indicating some paint loss. Glass paint cannot fade. However, an appearance resembling fading may occur. This is the result of a loss of paint from the glass surface. This may be due to several reasons ranging from a chemical incompatibility of the paint and the glass substrate to incorrect firing of the glass during initial fabrication of the window. Regardless of the original cause, all paint loss is greatly exacerbated by the presence of standing water on the surface of the glass.

WATERPROOFING COMPOUND

There is evidence that the waterproofing compound that seals the colored glass within the

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lead cames, has broken down. This is a result of the loss of the binding oil (most likely linseed oil) from the calcium carbonate based waterproofing compound. As the oil polymerizes and gets brittle, the putty turns to powder and falls out from under the flanges of the lead cames.

PROTECTIVE GLAZING

This only affects the large window in the front façade. As mentioned above, the single most destructive force acting on the windows is the heat gain from the sun. The protective glazing system that is presently installed on some of the exterior windows contributes greatly to the deterioration of these windows. The interstitial space between the protective glazing and the stained glass is not vented. The air column that is trapped between the protective glazing and the stained glass is being super-heated by the sun, just as the air in your car is heated when it is parked in the sun with the windows tightly closed. Tests done on stained glass windows in Philadelphia with unvented protective glazing installed yielded interior glass surface temperatures in excess of 140 degrees F, when the exterior ambient air temperature was 40 degrees F. This has four negative effects on the stained glass:

1/ the heat is transferred to the window thereby maximizing the negative effects of the expansion / contraction cycle, by increasing the temperature gradient experienced by the window;

2/ as the trapped air column heats up, it expands, forcing the window to bow to the interior;

3/ the increased temperature of the lead cames make them softer and easier to bend, maximizing the negative effects of items 1/ and 2/.

4/ Condensation forms in the unvented inter space between the protective glazing and the stained glass. The condensation is conducive to the growth of microorganisms whose by-products attack the lead cames and the stained glass. In addition to the direct damage to the stained glass, the condensation rusts the steel support bars and contributes to the deterioration of the bronze frames.

This completes the Window Assessment portion of the report.

Sincerely,

Arthur J. Femenella, Sr., President
Femenella & Associates, Inc.

361 CPW – SPECIAL WINDOWS CONDITIONS ASSESSMENT (STAINED GLASS) PAGE 9

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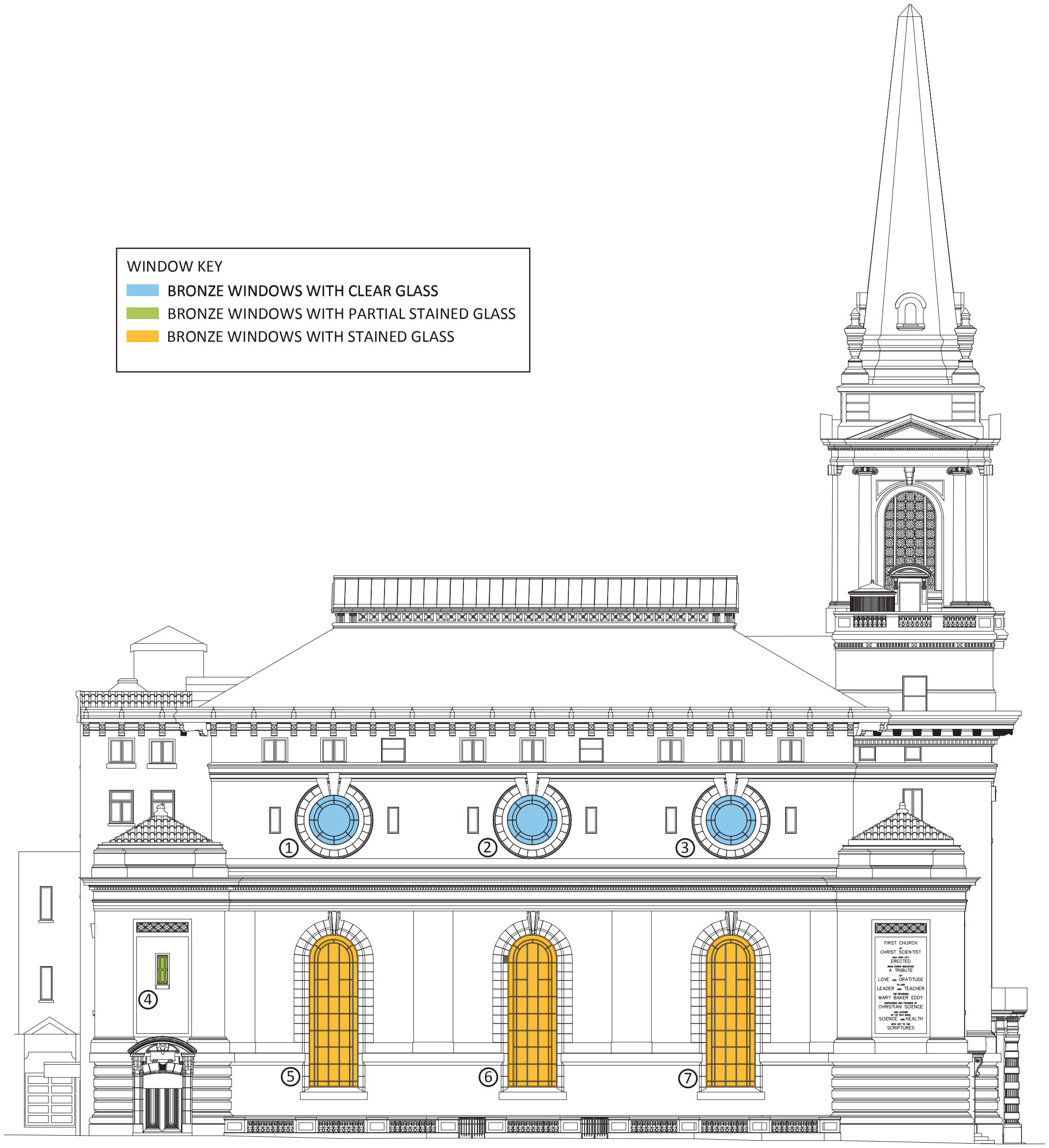
WINDOW KEY
- BRONZE WINDOWS WITH CLEAR GLASS
- BRONZE WINDOWS WITH PARTIAL STAINED GLASS
- BRONZE WINDOWS WITH STAINED GLASS



SOUTH ELEVATION

GENERAL WINDOW CONDITIONS

WINDOWS 1, 2, & 3 - BRONZE WITH CLEAR GLASS:

Each circular bronze window has a center pivot sash and opens to ventilate the sanctuary space. The bronze is generally in good shape however it requires cleaning. Some small areas on windows 1 & 2 have staining from efflorescence and window 1 exhibits rust at the bottom mullion. The bronze frames and exhibit slight oxidation on the patina. Window 2 is the only window with a cracked pane of glass. Window glass requires cleaning. Most pivot windows operate properly however some do not fully latch shut or are missing latching hardware.

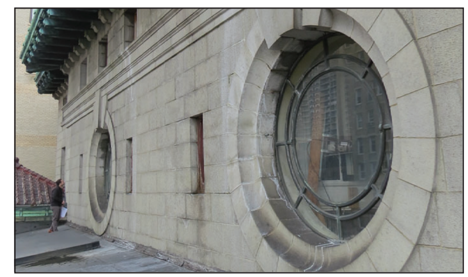
WINDOW 4 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY:

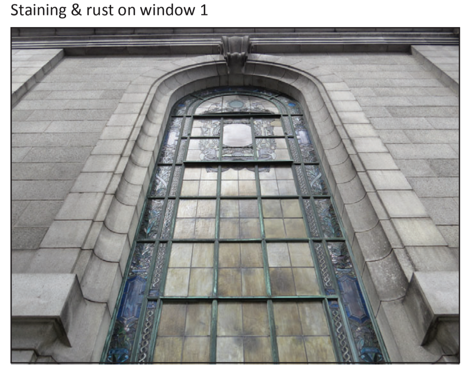
A small bronze window is located in the stair and contains stained glass at the perimeter only. This window is in fair condition and the bronze requires cleaning as there is rust and oxidation on the patina.

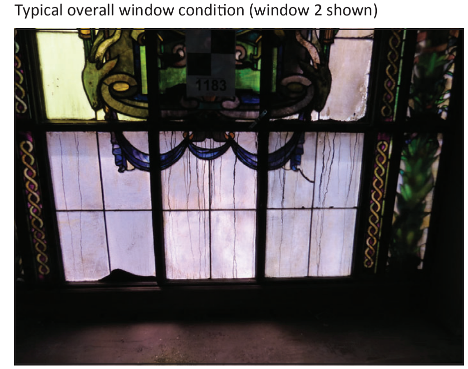
WINDOWS 5, 6, & 7 - BRONZE WITH STAINED GLASS:

The stained glass windows are set in bronze frames and sash and are held in place with bronze glazing stops. These South facing side windows have a center-pivot ventilating sash and have protective glazing on the inside of the windows. The middle window (window 6) was restored around 1995, after a brick was thrown through the glass. During the restoration the protective glazing was placed on the exterior of the window and the glass was cleaned. This window is in visibly better shape than the others and is in good condition overall. Windows 5 & 7 are in poor condition. They are extremely soiled, and dirt has built up in the space between the glass and the protective glazing. Most of the border panels are bowed outward, probably from heat buildup and water infiltration into the space between the glass and protective glazing. The larger panels are sagging. Pieces of glass are cracked or broken at various locations on most windows. The bronze frames and exhibit areas of rust and oxidation on the patina.

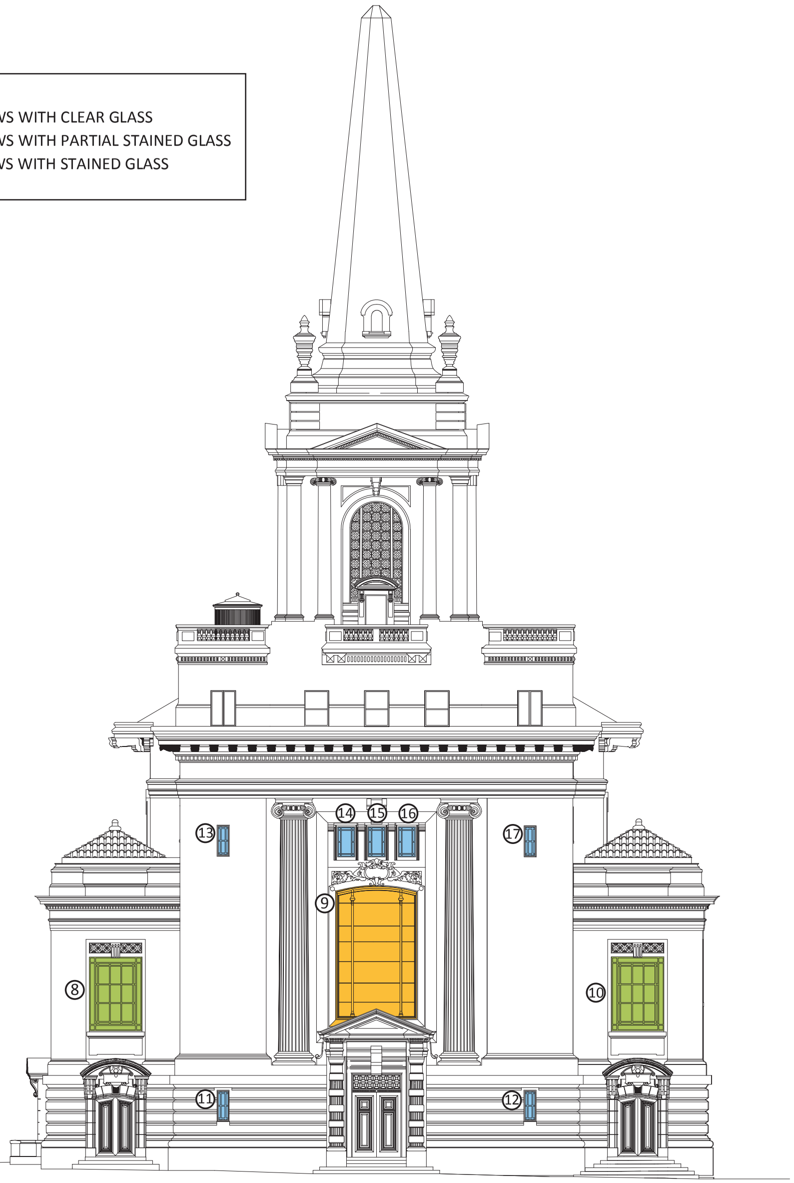

Staining & rust on window 1


Typical overall window condition (window 2 shown)


Typical condition of stained glass window (window 7 shown)


Soiling at inside of stained glass (window 5 shown)

WINDOW KEY
- BRONZE WINDOWS WITH CLEAR GLASS
- BRONZE WINDOWS WITH PARTIAL STAINED GLASS
- BRONZE WINDOWS WITH STAINED GLASS



EAST ELEVATION

GENERAL WINDOW CONDITIONS

WINDOWS 8 & 10 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY:

The stained glass windows are set in bronze frames and are held in place with bronze glazing stops. These East facing front windows have a center-pivot ventilating sash at the bottom and have protective glazing on the inside of the windows. Both windows 8 & 10 are in poor condition. They are extremely soiled, and dirt has built up in the space between the glass and the protective glazing. Some of the border panels are bowed outward, probably from heat buildup and water infiltration into the space between the glass and protective glazing. There is slight rusting observed on the bronze near the pivot joints. Three (3) large panes of glass are observed to be cracked on window 8 and one (1) large pane is broken on window 10. The bronze frames and exhibit areas of rust and oxidation on the patina.

WINDOW 9 - BRONZE WITH STAINED GLASS:

The large, center window is set in bronze frames and contains full stained glass depicting Jesus and Mary in the Garden after the Resurrection, attributed (not verified) in design and execution to John LaFarge. The fixed stained glass window has protective glazing on the exterior which is dirtied and yellowing. One (1) exterior glazing panel is cracked and previously caulked. The bronze window frame and mullions are more decoratively detailed than the other bronze frames and exhibit areas of rust and oxidation on the patina.

WINDOWS 11, 12, 13, 14, 15, 16, & 17 - BRONZE WITH CLEAR GLASS:

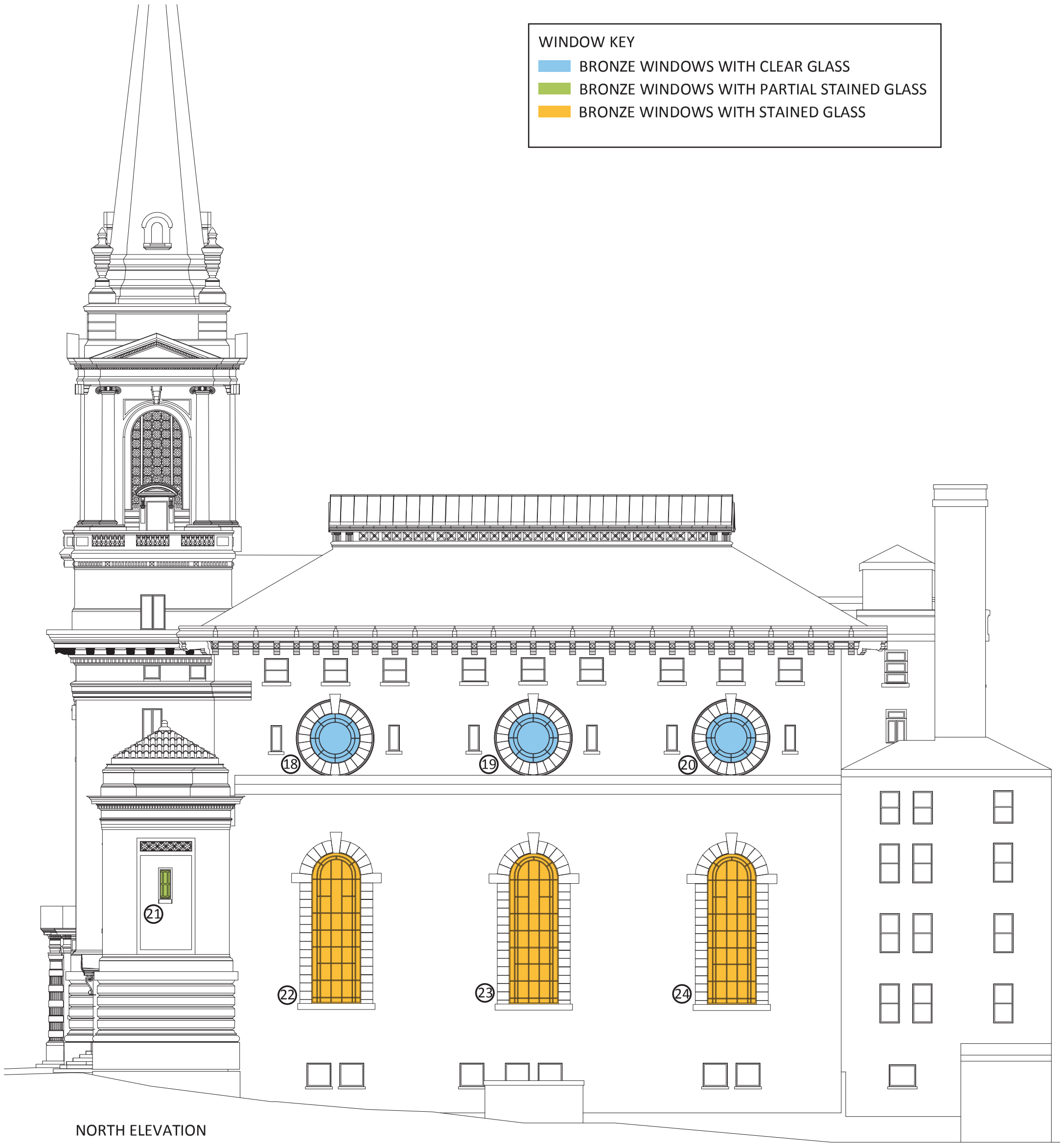
These smaller bronze windows contain clear glass. The windows are in poor/fair condition and the bronze requires cleaning as there is rust and oxidation on the patina. The glass is discoloring and dirty. Window 11 has two (2) cracked panes of glass. The glass at the central portion of Window 14 has been replaced with plexiglass and a circular opening has been cut.


Typical window condition (window 10 shown)


Windows 14, 15, & 16


Broken glass at window 11


Typical view of window 9



NORTH ELEVATION

GENERAL WINDOW CONDITIONS

WINDOWS 18, 19, & 20 - BRONZE WITH CLEAR GLASS:
Each circular bronze window has a center pivot sash and opens to ventilate the sanctuary space. The bronze is generally in good shape however it requires cleaning. The bronze frames and exhibit slight oxidation on the patina. Window glass requires cleaning, but there are no cracked or broken panes. Most pivot windows operate properly however some do not fully latch shut or are missing latching hardware.

WINDOW 21 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY:

A small bronze window is located in the stair and contains stained glass at the perimeter only. This window is in poor condition and the bronze requires cleaning. The main glass panel is cracked and it appears as if some perimeter stained glass is not secure in its frame.

WINDOWS 22, 23, & 24 - BRONZE WITH STAINED GLASS:

The stained glass windows are set in bronze frames and sash and are held in place with bronze glazing stops. These North facing side windows have a center-pivot ventilating sash and have protective glazing on the inside of the windows. Windows 5, 6, & 7 are in poor condition. They are extremely soiled, and dirt has built up in the space between the glass and the protective glazing. Many of the border panels are bowed outward, probably from heat buildup and water infiltration into the space between the glass and protective glazing. The larger panels are sagging. Pieces of glass are cracked or broken at various locations on most windows. Further inspection will require access to the neighboring property.


Broken glass at window 21


Typical window condition from inside (window 18 shown)


Typical overall window condition (window 19 shown)


Rust & staining on bronze from inside (window 20 shown)

WINDOW KEY
- BRONZE WINDOWS WITH CLEAR GLASS
- BRONZE WINDOWS WITH PARTIAL STAINED GLASS
- BRONZE WINDOWS WITH STAINED GLASS

WEST ELEVATION

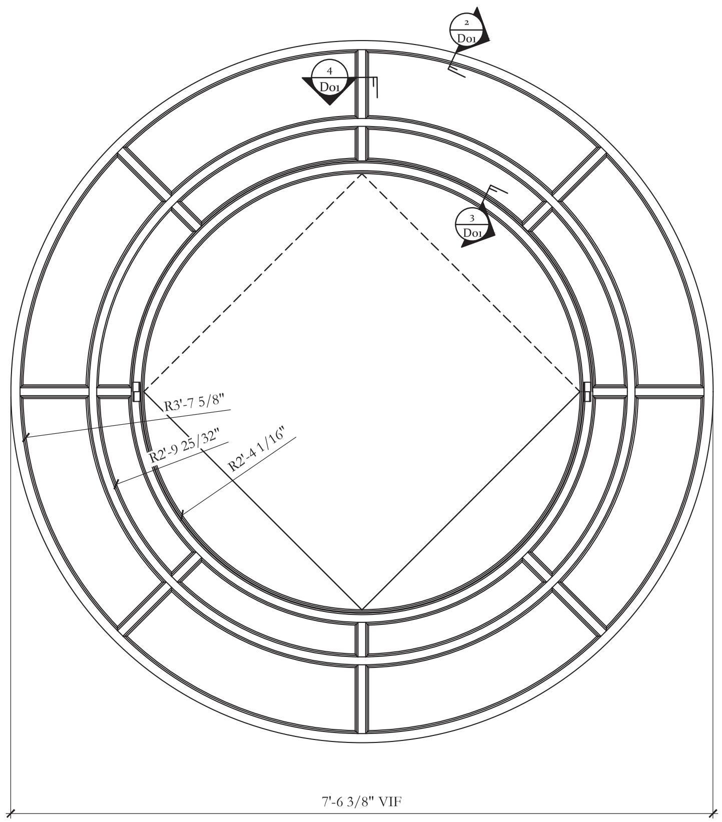
GENERAL WINDOW CONDITIONS

WINDOW 25 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY:

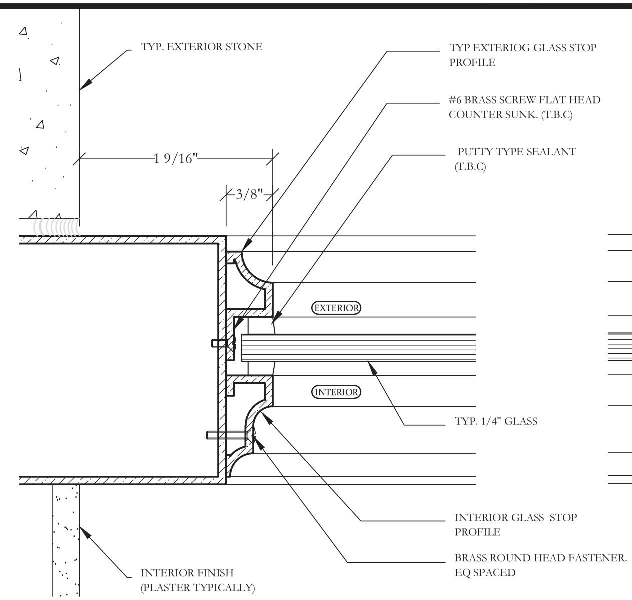
The stained glass window is set in bronze frames and are held in place with bronze glazing stops. This West facing window has a center-pivot ventilating sash at the bottom and has protective glazing on the inside of the windows. The window is in poor condition. It is soiled, and dirt has built up in the space between the glass and the protective glazing. Some of the border panels are bowed outward, especially at the bottom. There is slight rusting observed on the bronze and oxidation on the patina.

View of window 25

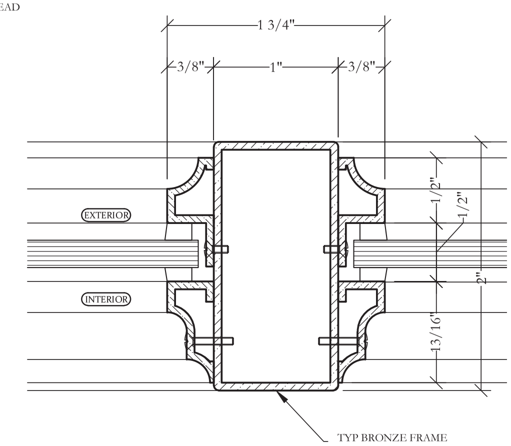
Typical bowing stained glass (window 25)



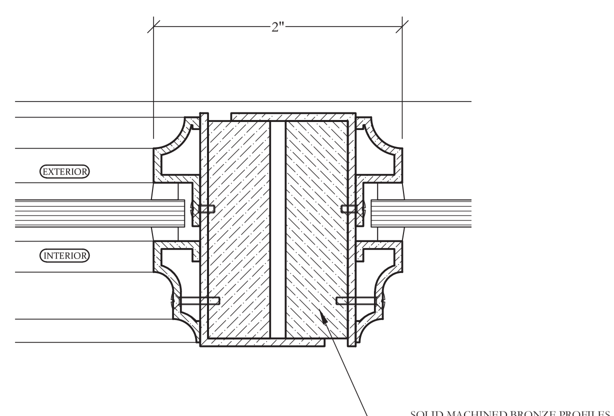
1 ELEVATION
Scale: 3/4" = 1'-0" (1:16)



2 TYPICAL JAMB DETAIL
Scale: Full Scale (1:1)



4 TYPICAL MULLION DETAIL
Scale: Full Scale (1:1)



3 OPERABLE MULLION DETAIL
Scale: Full Scale (1:1)

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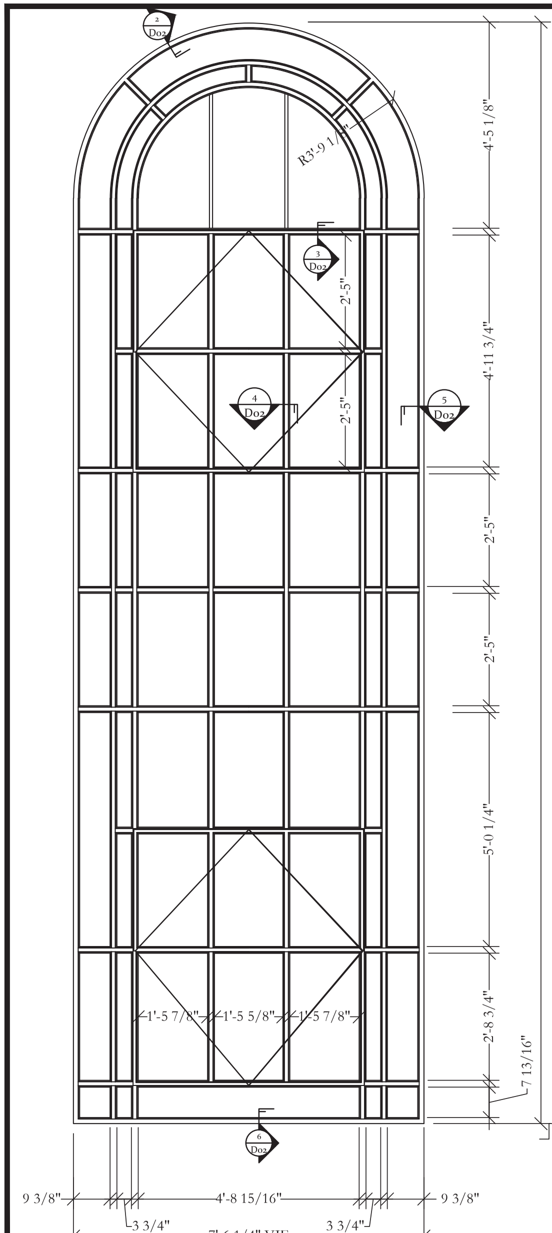
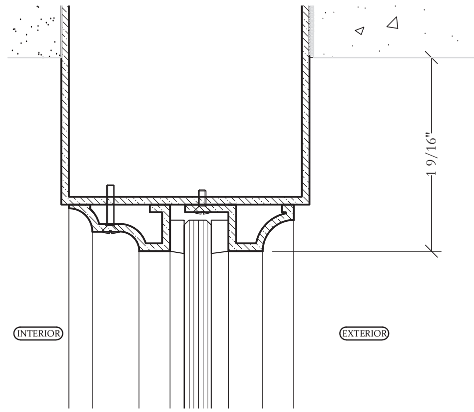
Project: Children's Museum of Manhattan
Window 1 - Survey of Existing

SCALE:	As noted	DRAWN BY:	MC	PRINT: 11 x 17
DATE:	10/30/2019	REVISION:	-	
DRAWING:				

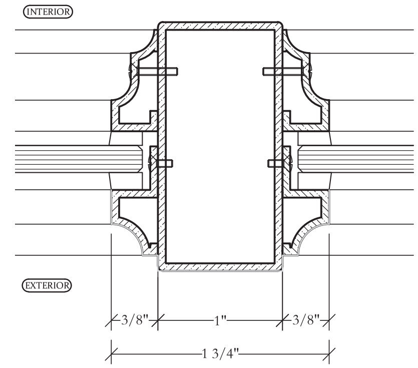
D01



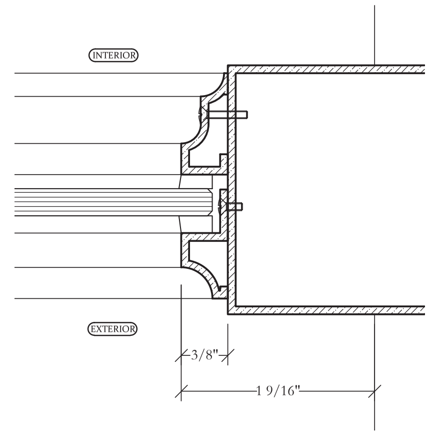
1 ELEVATION
Scale: 3/8" = 1'-0" (1:32)



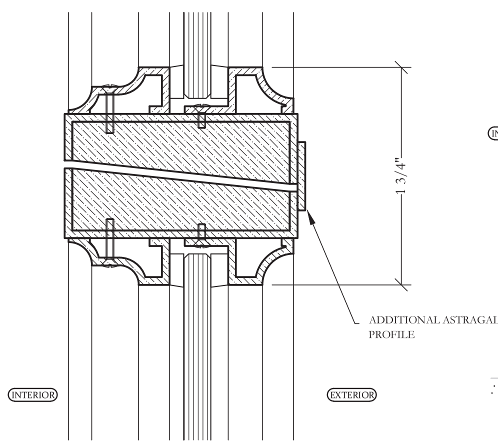
2 TYPICAL HEADER DETAIL
Scale: Full Scale (1:1)



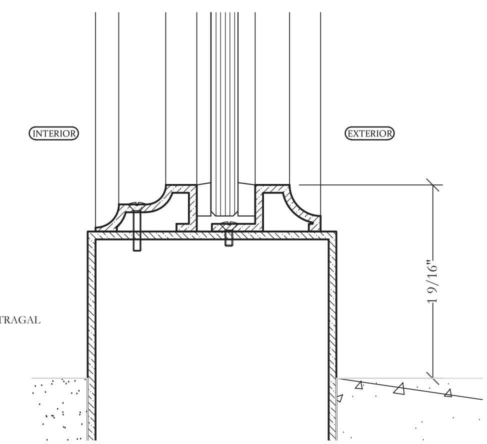
4 TYPICAL MULLION DETAIL
Scale: Full Scale (1:1)



5 TYPICAL JAMB DETAIL
Scale: Full Scale (1:1)



3 OPERABLE TRANSOM DETAIL
Scale: Full Scale (1:1)



6 TYPICAL SILL DETAIL
Scale: Full Scale (1:1)

SEE GENERAL NOTES ON D01

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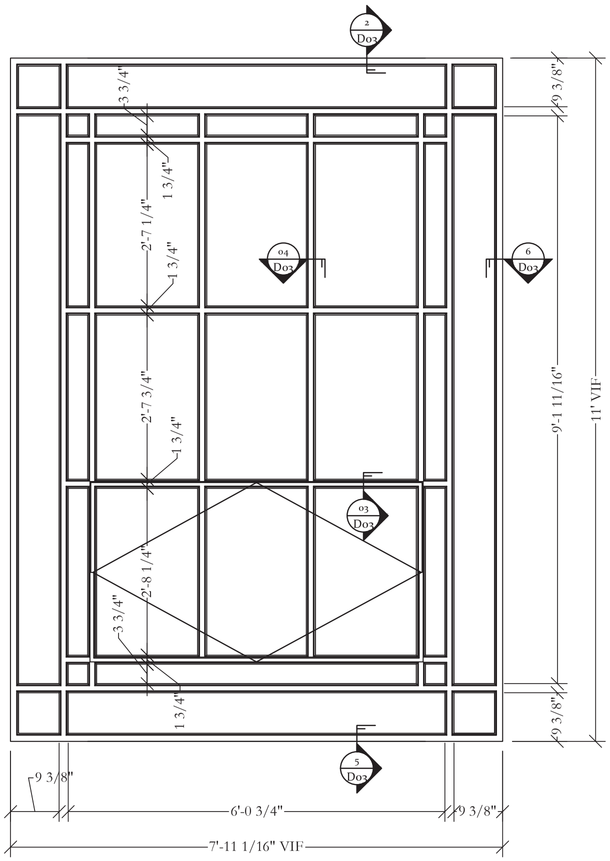
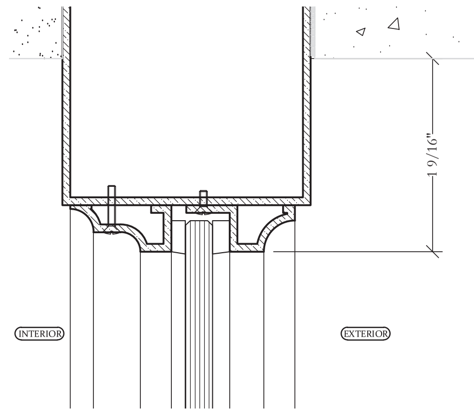
Project: Children's Museum of Manhattan
Window 5 - Survey of Existing

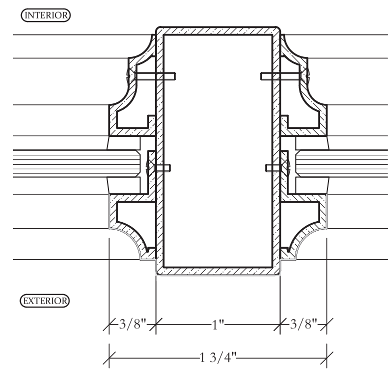
SCALE:	As noted	DRAWN BY:	MC	PRINT: 11 x 17	
DATE:	10/29/2019	REVISION:	-		
DRAWING:					D02



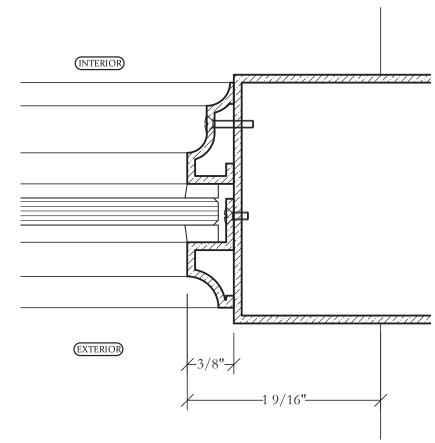
1 ELEVATION
Scale: 1/2" = 1'-0" (1:24)



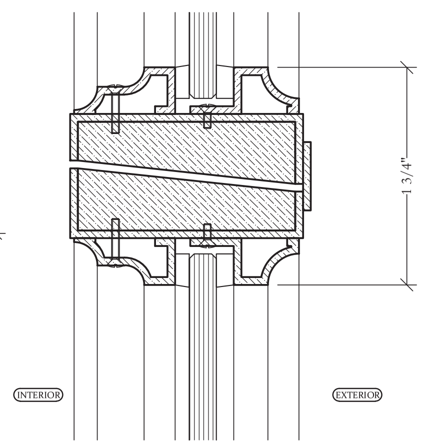
2 TYPICAL HEADER DETAIL
Scale: Full Scale (1:1)



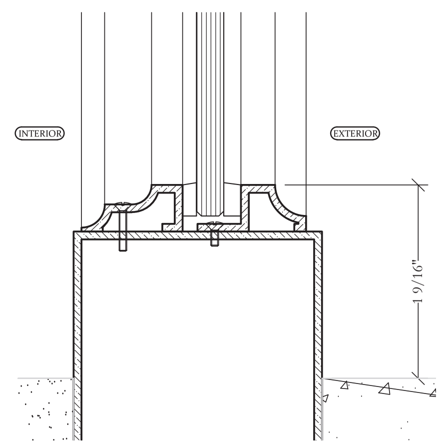
4 TYPICAL MULLION DETAIL
Scale: Full Scale (1:1)



6 TYPICAL JAMB DETAIL
Scale: Full Scale (1:1)



3 OPERABLE TRANSOM DETAIL
Scale: Full Scale (1:1)



5 TYPICAL SILL DETAIL
Scale: Full Scale (1:1)

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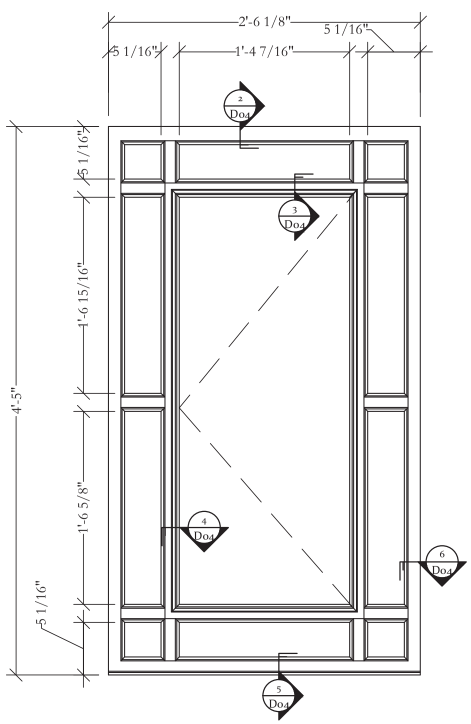
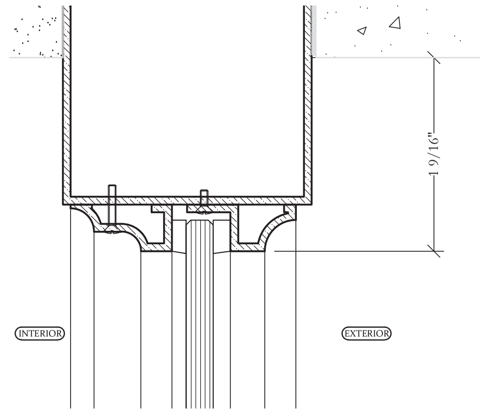
Project: Children's Museum of Manhattan
Window 8 - Survey of Existing

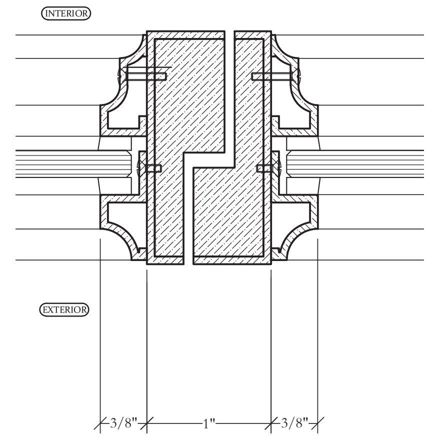
SCALE:	As noted	DRAWN BY:	MC	PRINT: 11 x 17	
DATE:	10/29/2019	REVISION:	-		
DRAWING:					D03



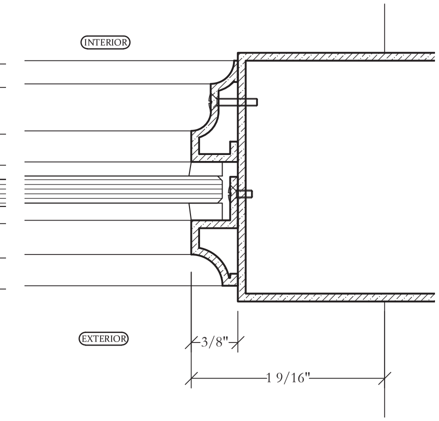
1 ELEVATION
Scale: 1" = 1'-0" (1:12)



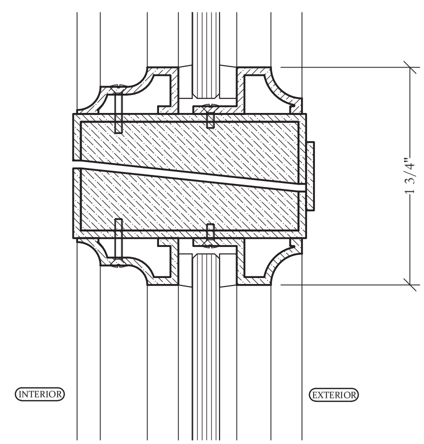
2 TYPICAL HEADER DETAIL
Scale: Full Scale (1:1)



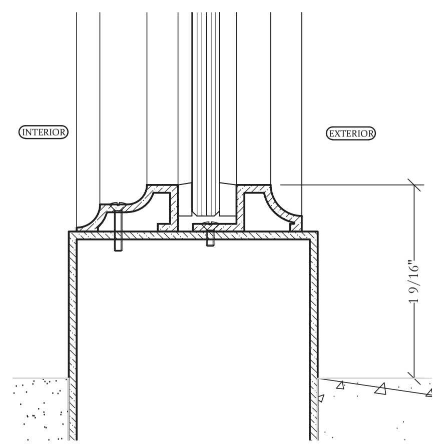
4 OPERABLE MULLION DETAIL
Scale: Full Scale (1:1)



6 TYPICAL JAMB DETAIL
Scale: Full Scale (1:1)



3 OPERABLE TRANSOM DETAIL
Scale: Full Scale (1:1)



5 TYPICAL SILL DETAIL
Scale: Full Scale (1:1)

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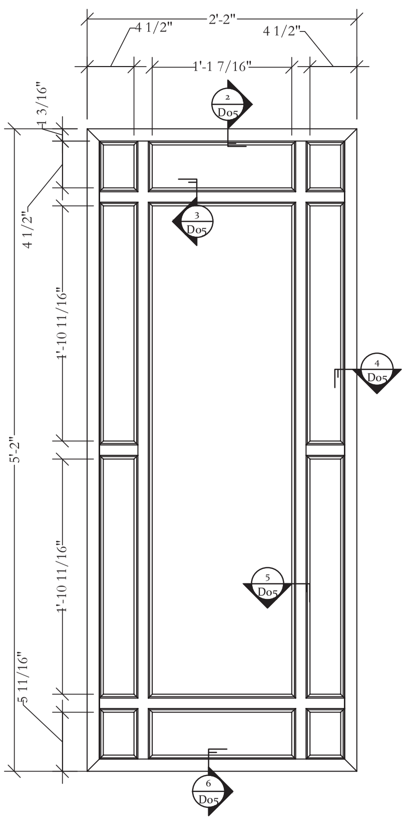
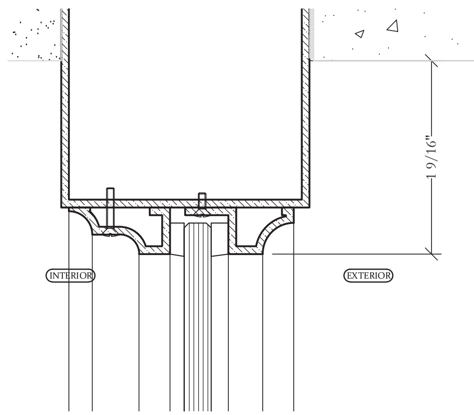
Project: Children's Museum of Manhattan
Window 15 - Survey of Existing

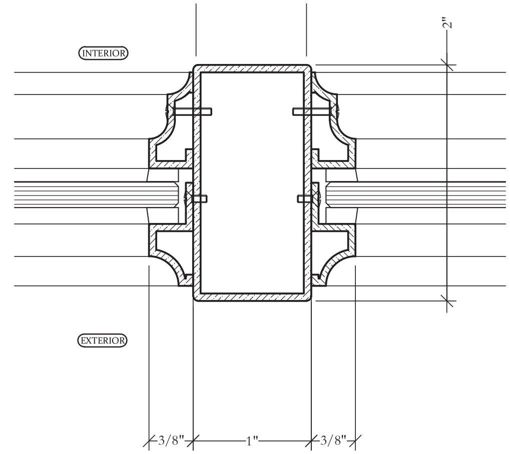
SCALE: As noted	DRAWN BY: MC		PRINT: 11 x 17	
DATE: 10/29/2019	REVISION: -			
DRAWING:				D04



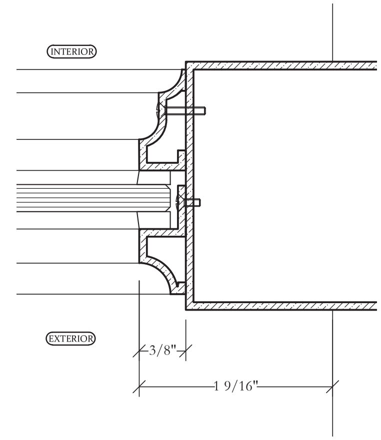
1 ELEVATION
Scale: 1" = 1'-0" (1:12)



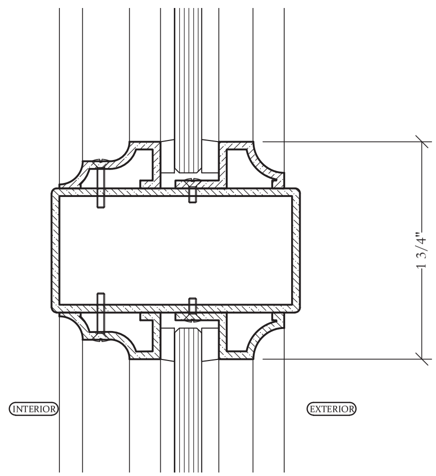
2 TYPICAL HEADER DETAIL
Scale: Full Scale (1:1)



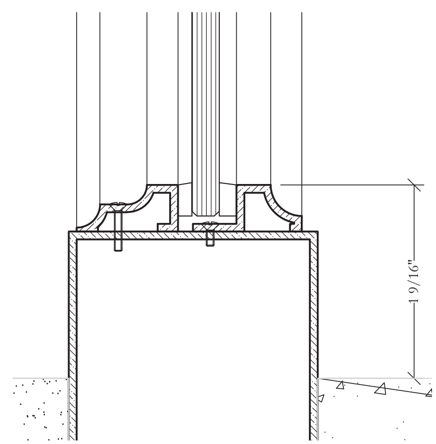
5 TYPICAL MULLION DETAIL
Scale: Full Scale (1:1)



4 TYPICAL JAMB DETAIL
Scale: Full Scale (1:1)



3 TYPICAL MULLION DETAIL
Scale: Full Scale (1:1)



6 TYPICAL SILL DETAIL
Scale: Full Scale (1:1)

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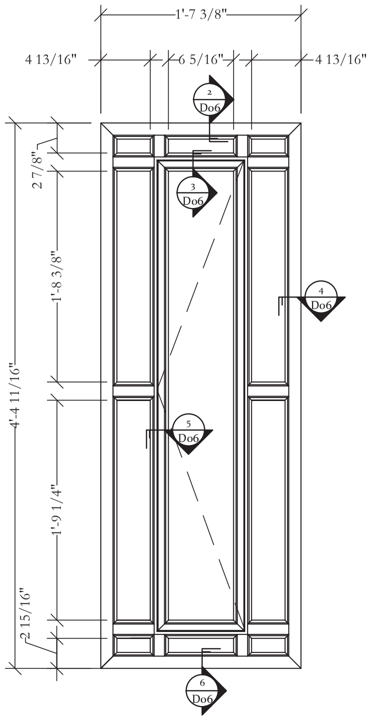
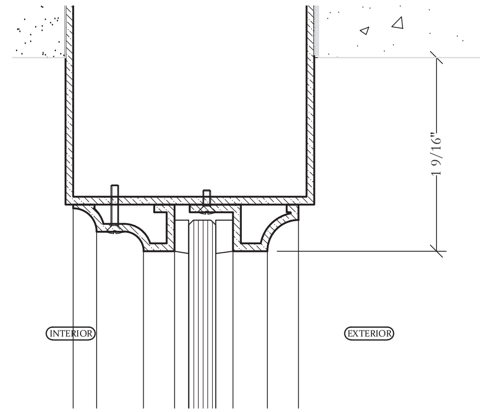
Project: Children's Museum of Manhattan
Window 12 - Survey of Existing

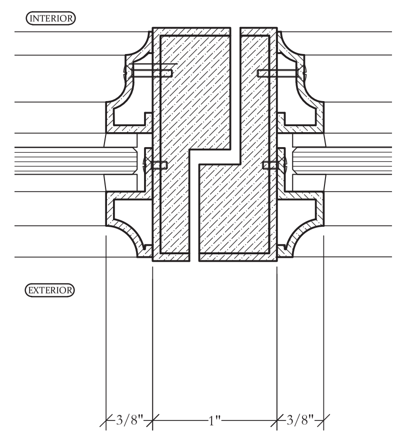
SCALE:	As noted	DRAWN BY:	MC	PRINT: 11 x 17
DATE:	10/29/2019	REVISION:	-	
DRAWING:				D05



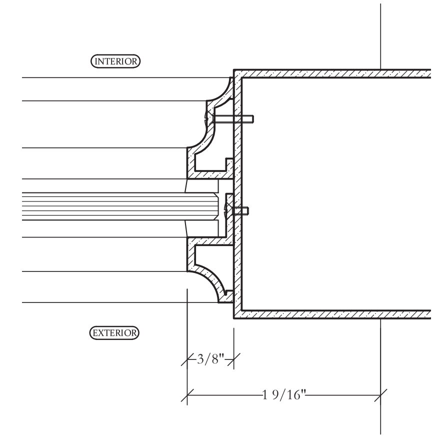
1 ELEVATION
Scale: 1" = 1'-0" (1:12)



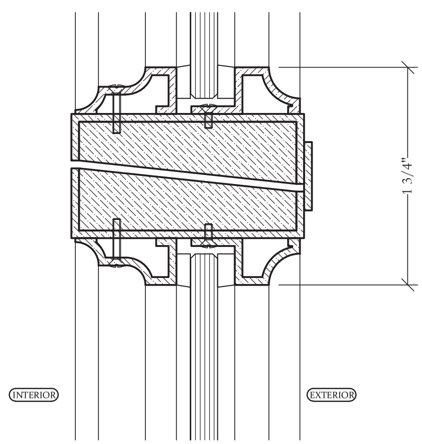
2 TYPICAL HEADER DETAIL
Scale: Full Scale (1:1)



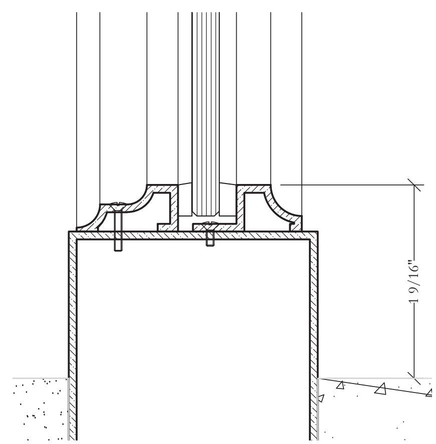
5 OPERABLE MULLION DETAIL
Scale: Full Scale (1:1)



4 TYPICAL JAMB DETAIL
Scale: Full Scale (1:1)



3 OPERABLE TRANSOM DETAIL
Scale: Full Scale (1:1)



6 TYPICAL SILL DETAIL
Scale: Full Scale (1:1)

SEE GENERAL NOTES ON D01

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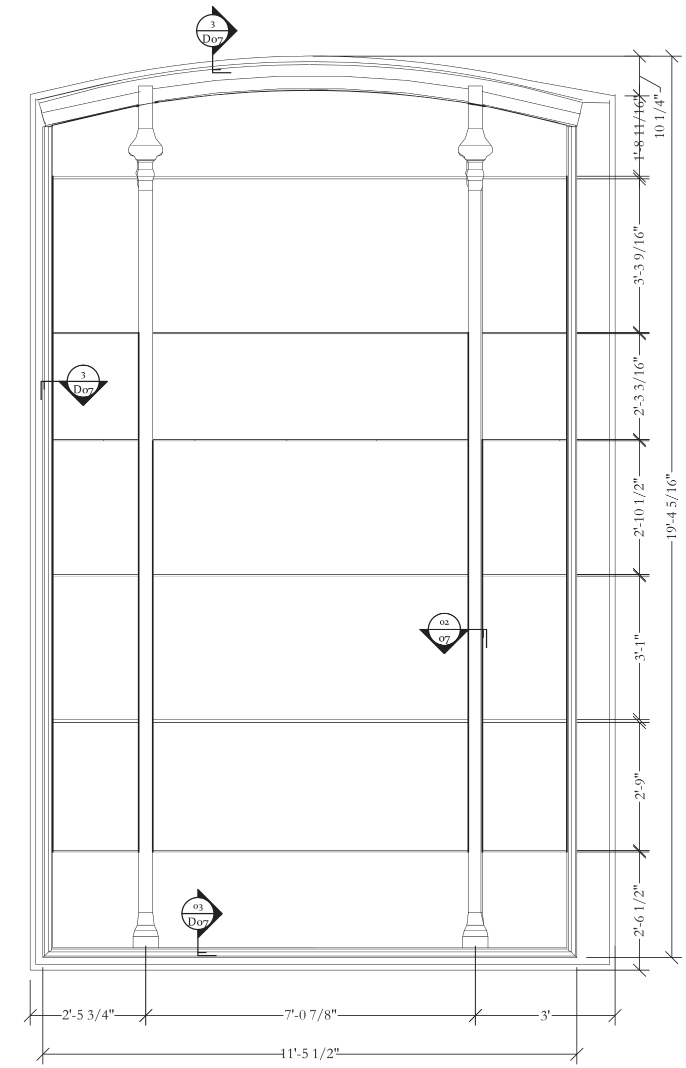
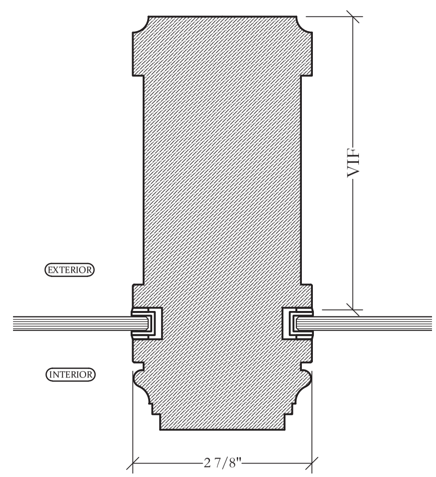
Project: Children's Museum of Manhattan
Window 21 - Survey of Existing

SCALE:	As noted	DRAWN BY: MC		PRINT: 11 x 17
DATE:	10/29/2019	REVISION: -		
DRAWING:				D06

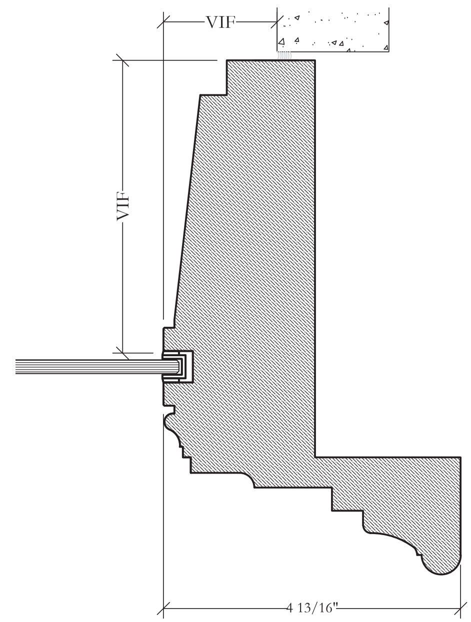
NOTE: Exterior could not be surveyed. Requires manlift



1 ELEVATION
Scale: 3/8" = 1'-0" (1:32)



2 POST
Scale: 6" = 1'-0" (1:2)



3 JAMB, HEADER, SILL
Scale: 6" = 1'-0" (1:2)

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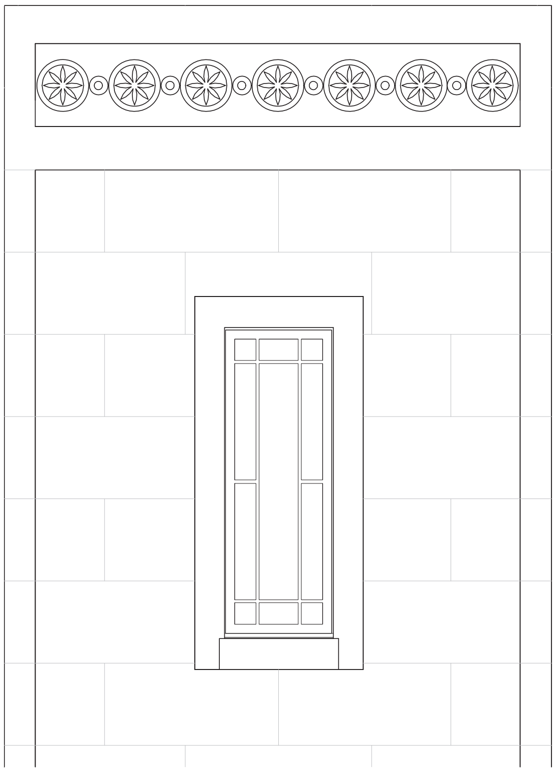
Project: Children's Museum of Manhattan
Window 9 - Survey of Existing

SCALE:	As noted	DRAWN BY:	MC	PRINT: 11 x 17
DATE:	10/29/2019	REVISION:	-	
DRAWING:				D07



4

WINDOW 4 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY

Scale: 1/2" = 1'-0"

INTERIOR VIEW

EXTERIOR VIEW

DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it, that has solarized due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

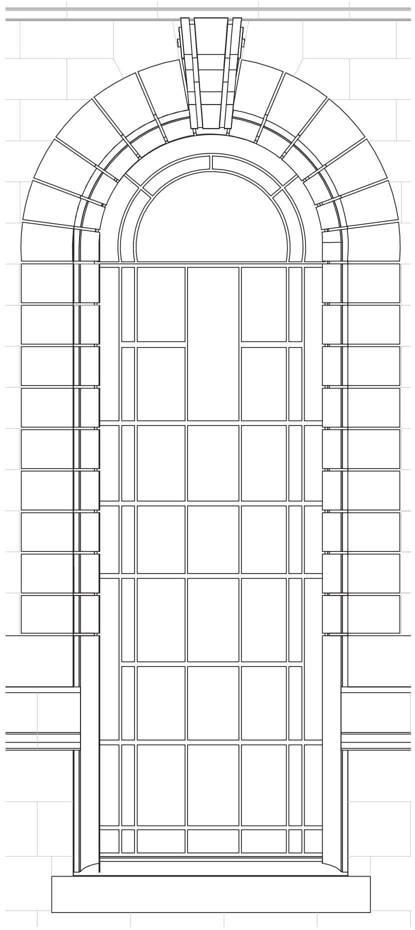
GENERAL CONDITION

The window is in fair to good condition. There is minimal deflection in the panels. All of the original glass is present (see notes below). The interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation.There is an accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates.

CODE FOR DAMAGE

- (blue) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (red) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (green) Area of broken glass.

10 COUNTY LINE ROAD, SUITE 24
BRANCHBURG, NJ 08876
www.femenellaassociates.com
TELEPHONE (908) 722-6526
FACSIMILE (908) 722-6528



5

WINDOW 5 - BRONZE WITH STAINED GLASS

Scale: 1/4" = 1'-0"

DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it. that has solarized due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. **Vitreous Paint.** The medallion is painted with vitreous paint and enamels that have been fired in the kiln. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair condition. There is minimal deflection in the panels. Most of the original glass is present (see notes below). The interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation.There is a great accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates. There is broken glass and previous poor replacements.

CODE FOR DAMAGE

- (blue) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (red) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (green) Area of broken glass.

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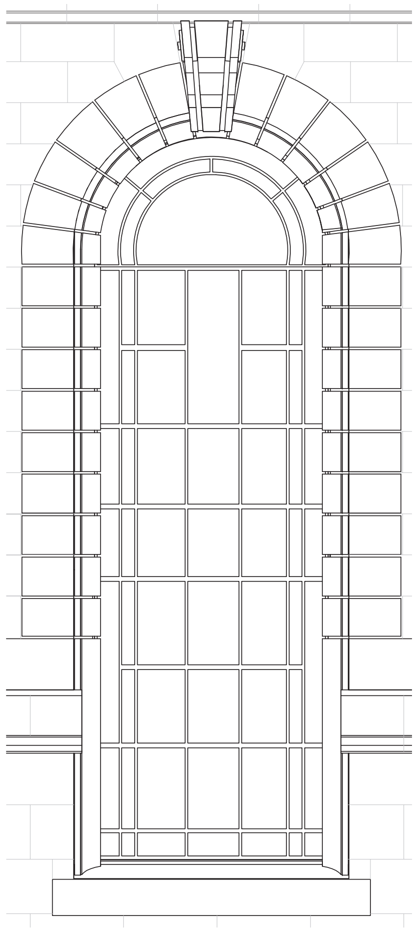

6

WINDOW 6 - BRONZE WITH STAINED GLASS

Scale: 1/4" = 1'-0"

DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This window has very little plating. This window was remade after being destroyed from vandalism. This border is illustrates what the balance of the borders would like once the interior plating was removed and they were all restored. **Vitreous Paint.** The medallion is painted with vitreous paint and enamels that have been fired in the kiln. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in good to very good condition. Most of the original glass is present (see notes below). There is a great accretion of dirt on the exterior and some dirt on the interior surfaces of the panels. This dirt is hygroscopic and is attracting water. There are previous replacements.

CODE FOR DAMAGE

- (blue) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (red) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (green) Area of broken glass.

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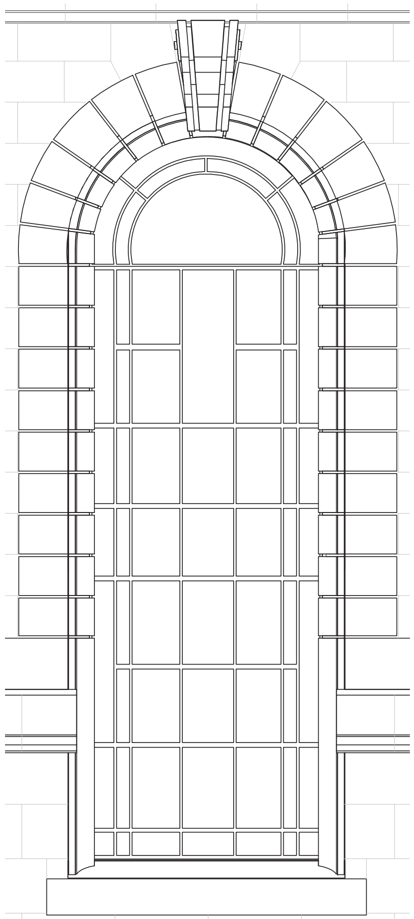


7

WINDOW 7 - BRONZE WITH STAINED GLASS

Scale: 1/4" = 1'-0"

DESCRIPTION

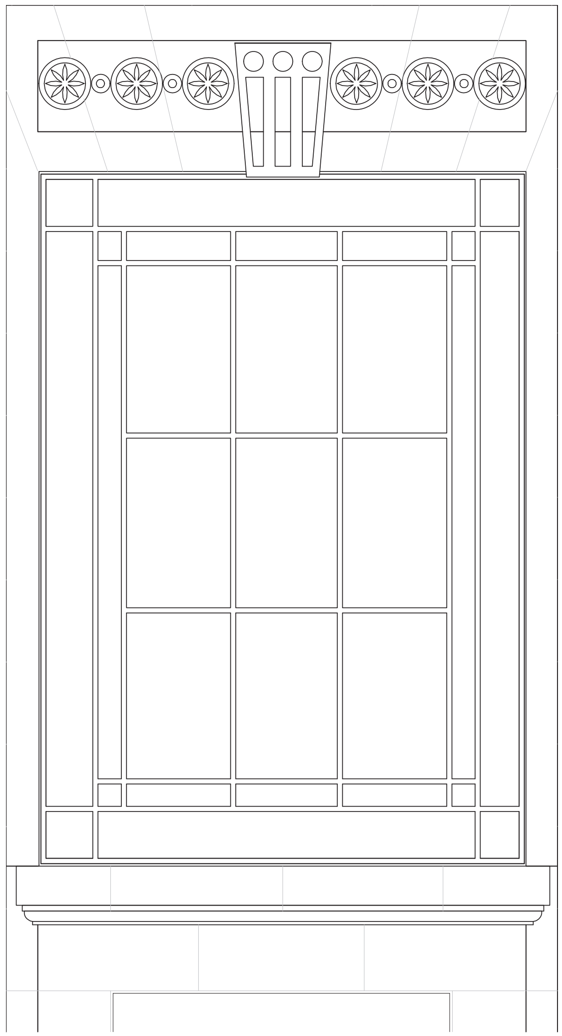
The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it. that has solarized due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. **Vitreous Paint.** The medallion is painted with vitreous paint and enamels that have been fired in the kiln. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair condition. There is minimal deflection in the panels. Most of the original glass is present (see notes below). The interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation.There is a great accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates. There is broken glass and previous poor replacements.

CODE FOR DAMAGE

- (Blue) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (Red) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (Green) Area of broken glass.
- (Yellow) Area of vitreous paint loss.



8

WINDOW 8 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY

Scale: 1/2" = 1'-0"

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DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair condition. There is minimal deflection in the panels. All of the original glass is present, but some of it is broken. (see notes below). Some of the interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation.There is an accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates.

CODE FOR DAMAGE

- (Blue dot) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (Red dot) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (Green dot) Area of broken glass.

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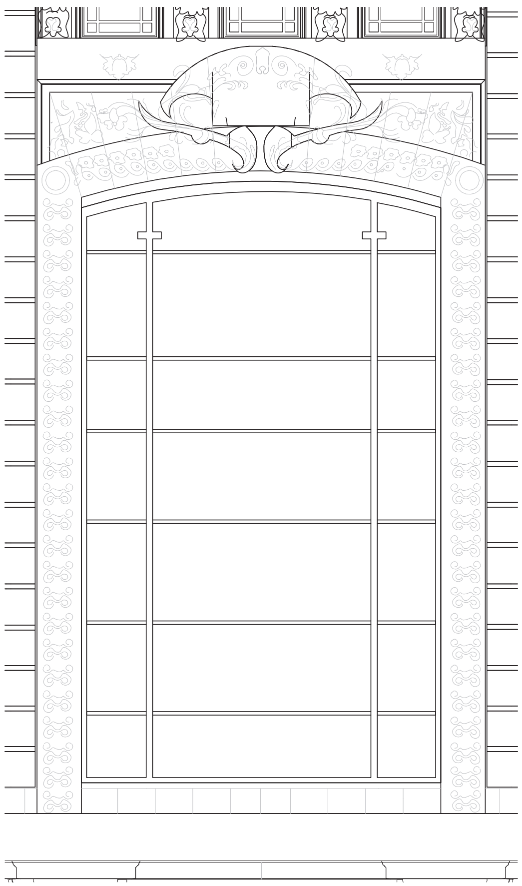
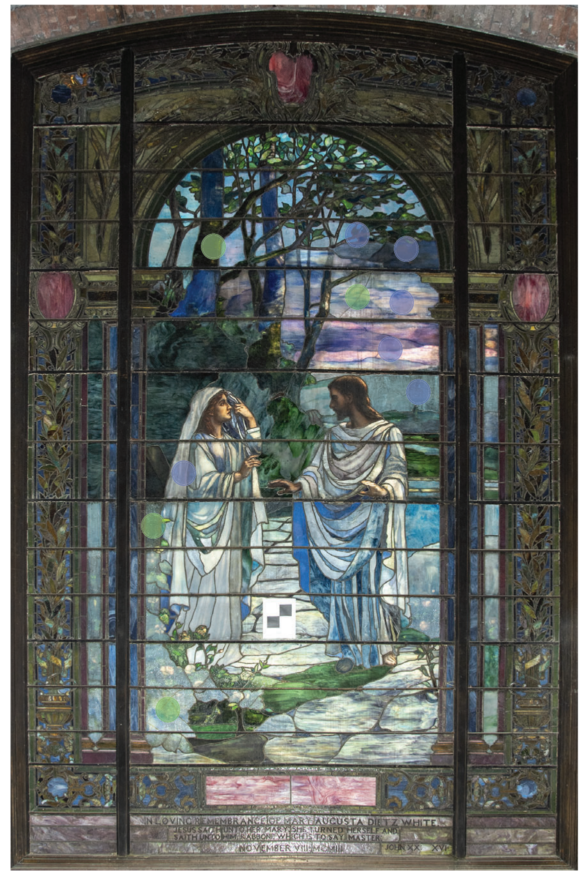




DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is three to five layers of plating. The plating is of various types of opalescent and rolled glass. **Vitreous Paint.** The faces and flesh of the figures is painted with vitreous paint and enamels that have been fired in the kiln. This is very well done and these passages of paint appear to be in good condition. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair to good condition. There is minimal deflection in the panels. Almost all of the original glass is present (see notes below). There is a great accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates. There is broken glass and some previous poor replacements, but not many.

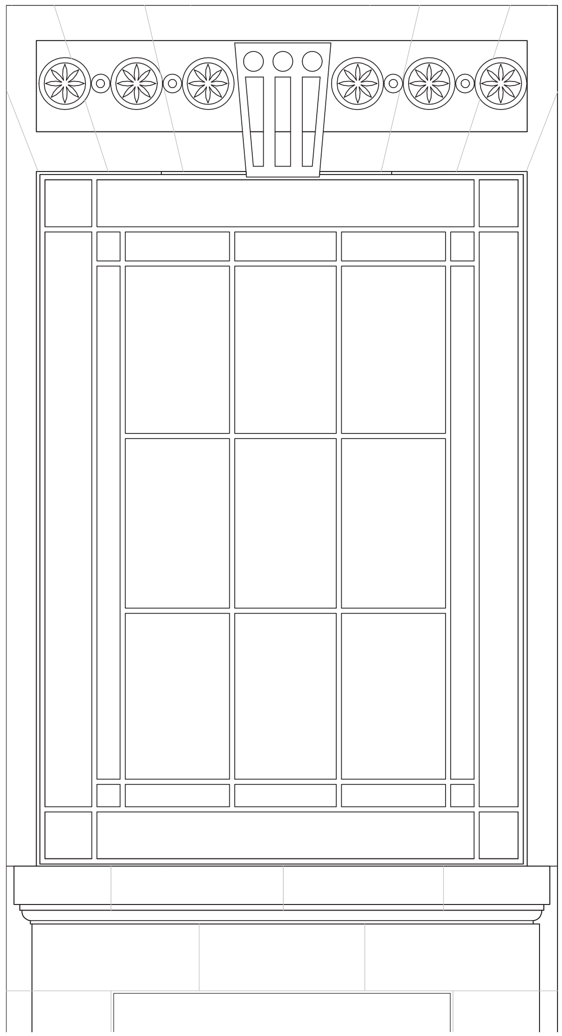
CODE FOR DAMAGE

- Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- Area of broken glass.

9

WINDOW 9 - BRONZE WITH STAINED GLASS

Scale: 1/4" = 1'-0"



DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair condition. There is minimal deflection in the panels. All of the original glass is present, but some of it is broken. (see notes below). Some of the interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation.There is an accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates.

CODE FOR DAMAGE

- (blue) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (red) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (green) Area of broken glass.

10

WINDOW 10 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY

Scale: 1/2" = 1'-0"

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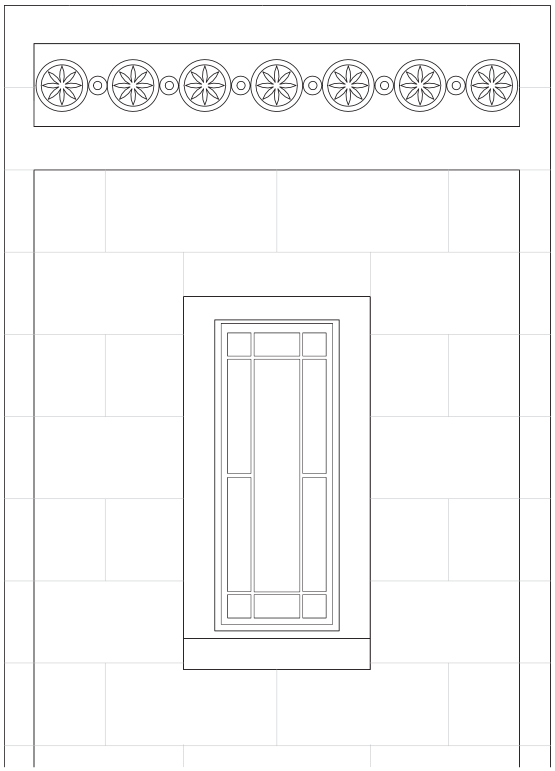


DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it, that has solarized due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair to good condition. There is minimal deflection in the panels. All of the original glass is present (see notes below). The interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation.There is an accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates.

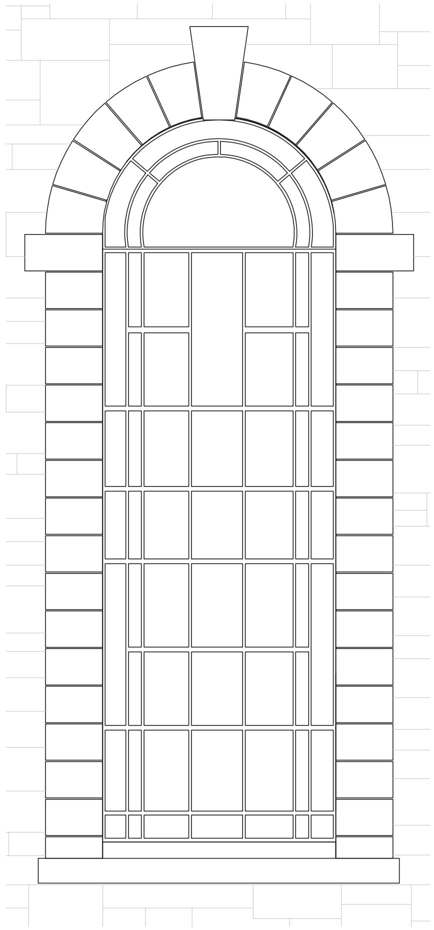
CODE FOR DAMAGE

- (blue dot) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (red dot) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (green dot) Area of broken glass.

21

WINDOW 21 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY

Scale: 1/2" = 1'-0"



22

WINDOW 22 - BRONZE WITH STAINED GLASS

Scale: 1/4" = 1'-0"

DESCRIPTION

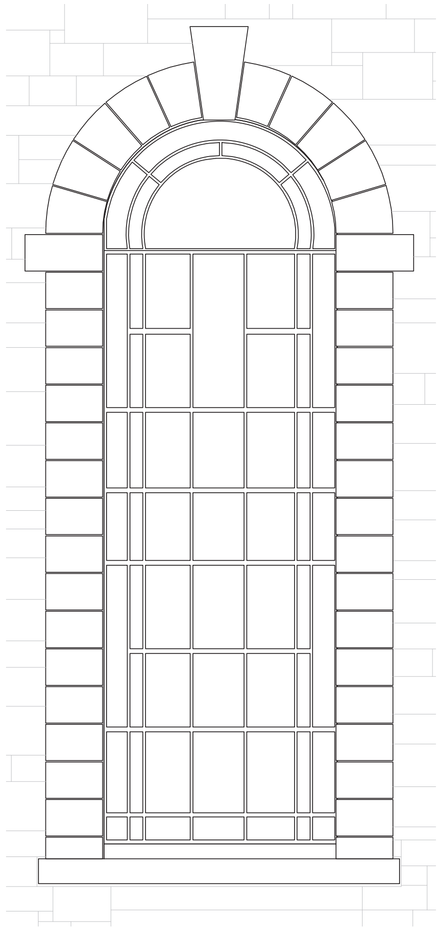
The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. All of the plating is on this window. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it. that has solarized due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. **Vitreous Paint.** The medallion is painted with vitreous paint and enamels that have been fired in the kiln. The paint is in very good condition. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair to good condition with the exception of the dirt. There is minimal deflection in the panels. Most of the original glass is present (see notes below). The interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. This is less than the South side due to the limited UV it has been exposed to. There is a great accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates. There is broken glass and previous poor replacements.

CODE FOR DAMAGE

- (blue dot) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (red dot) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (green dot) Area of broken glass.



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DESCRIPTION
The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. All of the plating is on this window. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it. that has solarized due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. **Vitreous Paint.** The medallion is painted with vitreous paint and enamels that have been fired in the kiln. The paint is in very good condition. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION
The window is in fair to good condition with the exception of the dirt. There is minimal deflection in the panels. Most of the original glass is present (see notes below). The interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. This is less than the South side due to the limited UV it has been exposed to. There is a great accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates. There is broken glass and previous poor replacements.

CODE FOR DAMAGE

- (blue dot) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (red dot) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (green dot) Area of broken glass.

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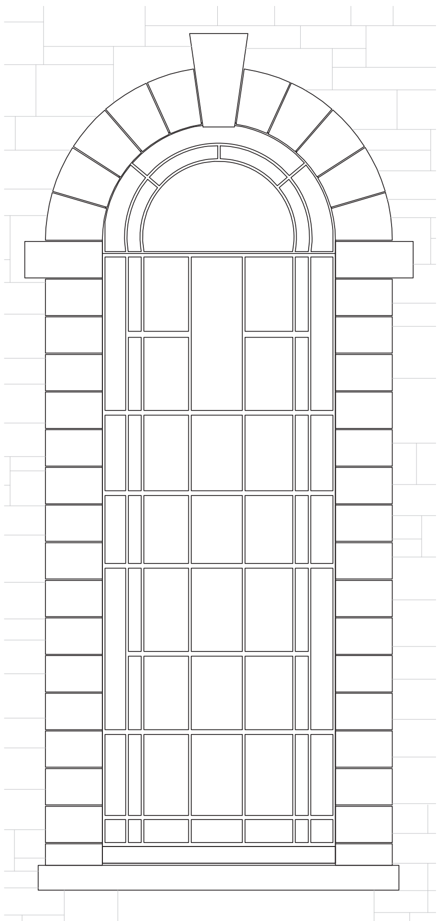

24

WINDOW 24 - BRONZE WITH STAINED GLASS

Scale: 1/4" = 1'-0"

DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. All of the plating is on this window. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it. that has solarized due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. **Vitreous Paint.** The medallion is painted with vitreous paint and enamels that have been fired in the kiln. The paint is in very good condition. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair to good condition with the exception of the dirt. There is minimal deflection in the panels. Most of the original glass is present (see notes below). The interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation. This is less than the South side due to the limited UV it has been exposed to. There is a great accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates. There is broken glass and previous poor replacements.

CODE FOR DAMAGE

- (blue) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (red) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (green) Area of broken glass.
- (yellow) Area of paint loss.

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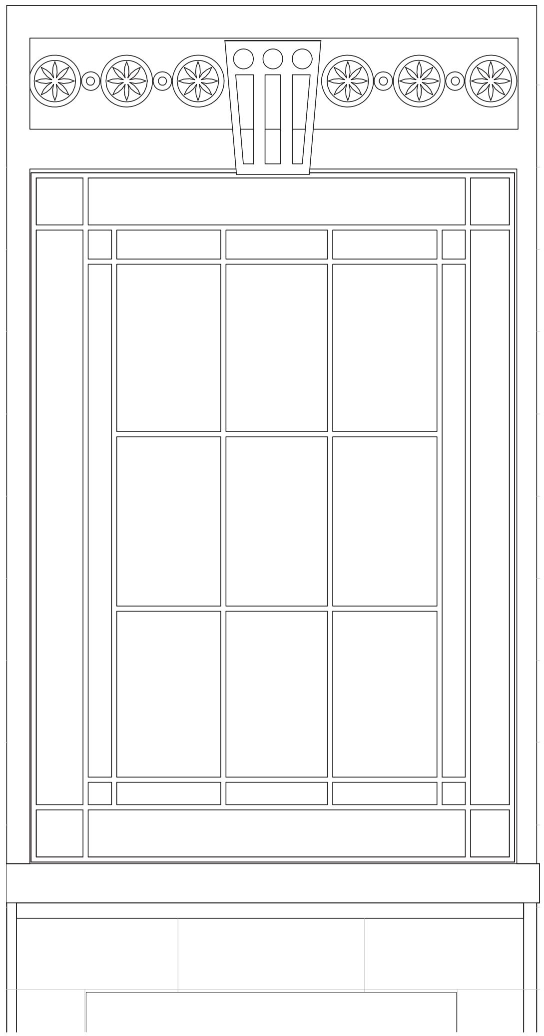

DESCRIPTION

The window is fabricated from a glass palette comprising opalescent glass and rolled glass held in a lead came matrix. The panels are set into a bronze frame and retained with hard-setting putty and and bronze moldings that are secured with brass machine screws. There is no protective glazing on this window. The special techniques employed are: **Plating.** This is the layering of glass on the window to achieve and artistic effect. There is one layer of plating. The plating is a rolled, soft-hammer glass that has been acid etched on the interior surface to add a visual softness to the image behind it. (See the DESCRIPTION section of the attached GENERAL WINDOW SURVEY).

GENERAL CONDITION

The window is in fair to good condition. There is minimal deflection in the panels. All of the original glass is present, but some of it is broken. (see notes below). Some of the interior plating has has solarized (turned a pinkish-purple color) due to an excess of manganese in the glass batch and exposure to ultra-violet radiation.There is an accretion of dirt and debris on the exterior and interior surfaces of the panels and trapped between the plates. This dirt is hygroscopic and is attracting water. There are condensation/leak trails on the interior surface and between the plates.

CODE FOR DAMAGE

- (Blue dot) Area of severe dirt and debris accretions. This accretion is hygroscopic, attracting water. Standing water adversely affects the lead cames, the framing, and in the long term, contributes to the corrosion of the glass.
- (Red dot) Area where the original glass is missing (interior plate) has been replaced with a poor color match.
- (Green dot) Area of broken glass.

25

WINDOW 25 - BRONZE WITH STAINED GLASS AT PERIMETER ONLY

Scale: 1/2" = 1'-0"