

5.27.2026

McGilvra Elementary School

Historic Wood Window Refurbishment & Glazing Replacement

Seattle Public Schools

Seattle Department of Neighborhoods
Historic Preservation & Landmarks

BREIF AGENDA

- 1.0 _ Project Narrative and Proposed Modifications
- 2.0 _ Scope of Work/ features to be Modified
- 3.0 _ Survey of Existing Conditions and Condition Photos
- 4.0 _ Product



1.1 Project Narrative

McGilvra Elementary School's main building was built in 1913. It was part of a \$675,000 bond approved by Seattle voters in 1912 to construct four new fireproof school buildings. Edgar Blair designed a masonry, nine-classroom, three-story school to be replicated and located at the following locations: McGilvra Elementary School (1913), McDonald Elementary (1914), and Concord Elementary (1915). The 1913 masonry building replaced the wood-framed Lake School building. The original Lake School building was constructed in 1899 on land the city acquired from John McGilvra. This site is located in the historic Madison neighborhood, developed by John McGilvra, North of Madison Street, just east of the Bradmoore Golf Course, occupying the entire block.

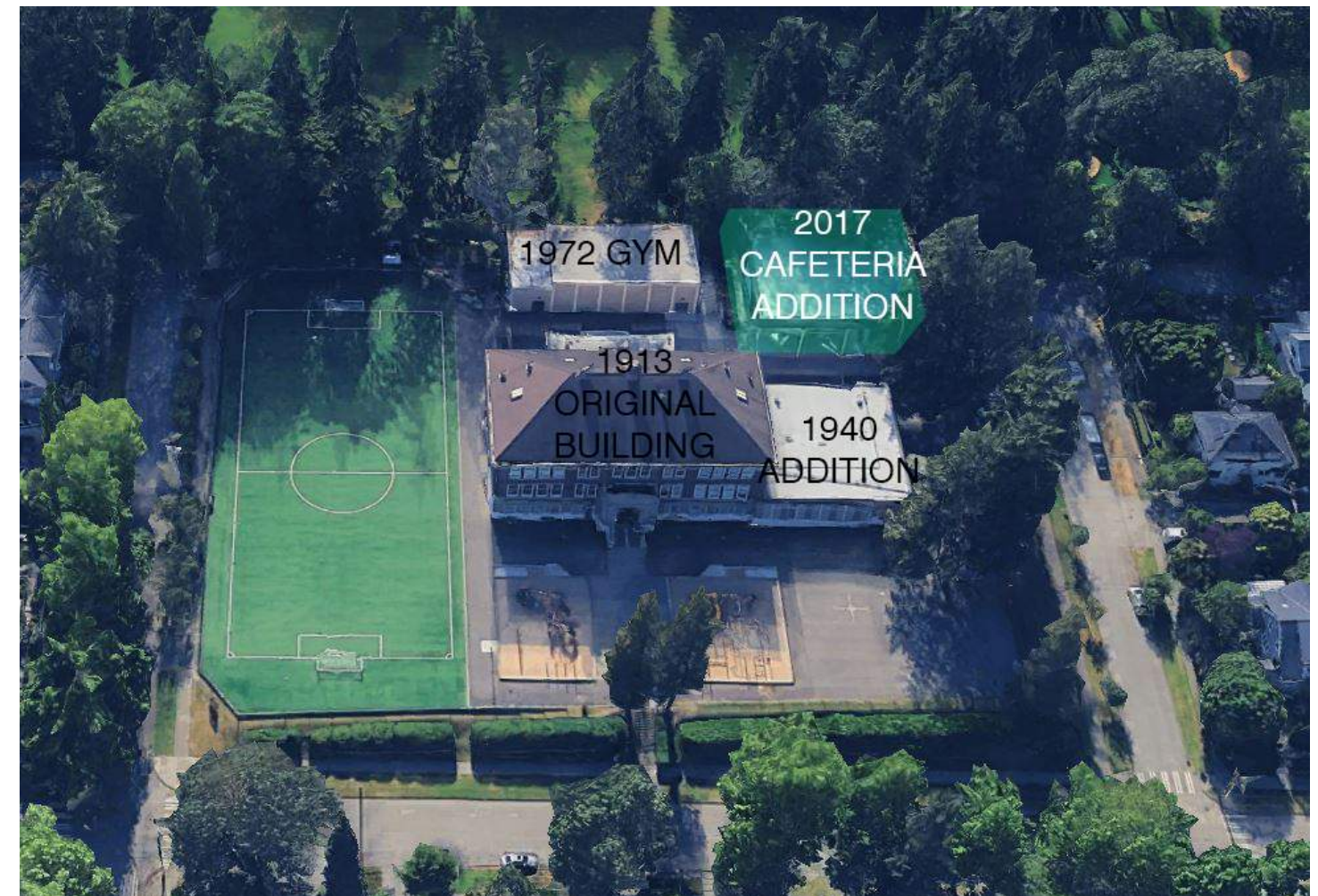
In 1940, a masonry, one-story classroom wing, designed by Naramore & Brady, was added to the north side of the 1913 main building, increasing the school capacity to 400.

In 1972, the gymnasium and outdoor covered playcourt designed by Huggard and Associates was constructed behind the main school building in the vacated 37th Ave East right of way. It was considered to be the most modern in the district at the time.

McGilvra Elementary School was designated as a landmark on October 15, 2014, including the 1913 main building and 1940 addition exterior and interior: the corridors, stairways, and classrooms. Also, including the site or property where the school is located.

The 1913 building is a simplified Beaux-Art style. The 1913 building is a symmetrical, three-story, rectangular box with exterior walls of red and buff brick on a cement base with limited terra cotta detail, a prominent, pitched, hipped roof marked by a sheet copper boxed cornice and block modillions. The front elevation is symmetrically composed of five unequal bays of slightly recessed window panels defining brick piers, and a traditional tripartite vertical arrangement of base (first floor), middle (second floor and third floor), and top (roof) with prominent horizontal terracotta bands separating the first and second floors. Bands of buff brick at the cornice line, window headers, and sills act as a contrast to the field of red brick. The front entry is embellished by an ornate, partially enclosed, brick and terracotta flat roof projecting porch, enclosing stairs that lead up to the main entrance on the second floor. The front porch is embellished with a terracotta band with the name J.J McGilvra School in it, additional terracotta bands, parapet coping, and a keystone and swag motif at the entry.

The windows are clustered into groups of two, three, or five, separated by narrow masonry piers. Windows on the second and third floors are wood sash 9'3"x5' wide, elongated proportion, and arranged in a three-over-three light configuration, while first-floor windows are 7'6" in height



McGilvra Elementary-Historic Wood Window Refurbishment & Glazing Replacement

Side elevations are expanses of brick with prominent central windows composed of two ganged windows arranged in the center, lighting the central corridor for each floor. On the first floor are double doors with side lights and a transom.

The rear elevation incorporates the same window types and sizes as the front, along with two building exits with concrete stairs at half-level, located at the North and South ends. Above the steps are mid-floor windows, which light the upper stair landing. At the rear is also a projecting one-story, flat-roofed building containing the boiler room and two large restrooms for boys and girls, with dark buff brick on a stucco-finished concrete base with terracotta coping at the parapet. The three visible elevations of the wing have utilitarian fenestration with wood sash in a three-over-three double-hung configuration. A square chimney stack from the boiler room is centered on the rear elevation of the main building.

The 1940 addition, height corresponds to the mid-level height of the second floor of the 1913 building. The exterior is red, and buff brick resting on a dash coat finished concrete base with an 18-inch decorative terracotta band and 6-inch terracotta coping at the parapet. The east and west elevations are arranged into six equal window bays, separated by slightly projecting truncated brick wall piers along with a modulating concrete base. The windows in the bays are wood sash, 7 ft 6 inches wide and 10ft 9 inches tall, divided by a heavy vertical center mullion, and a heavy horizontal mullion dividing the upper third from the lower two-thirds. The portion of the window assembly below the horizontal mullions consists of two operable two-over-two single-hung sashes. Above the mullions are two fixed, two-light sashes. The windows are protected with wire grilles. The north elevation of the 1940 addition is windowless with a building entrance with a projecting masonry surround.

The Interior of the 1913 building was originally designed with four classrooms on a double-loaded corridor, two small restrooms, a teacher's room, and the principal's office on the Second (main) floor. Four classrooms are organized around the double-loaded corridor, with a domestic science classroom at the center, and two small restrooms and stairwells at the end of the corridor. The ground floor had boys' and girls' separate playrooms, a meeting room, a manual training room, storage, and a fan room at the center, along with two large restrooms and a boiler room in a separate but attached one-story wing.

The 1940 one-story classroom wing addition on the north side included four identically sized rooms along a double-loaded corridor, serving as three classrooms and a library.



1.2_Past Alterations

1940: One-story, four-classroom addition to the north.

1962: Ground floor boy's restroom alteration

1970: An automatic sprinkler system was installed throughout the entire building.

1971: Concrete retaining wall constructed at the Southwest property line to regrade and install the initial playground

1972: A gymnasium with an outdoor playcourt was constructed

1973: substantial alteration of the second floor, where walls separating classrooms from the corridor were removed, and new ceiling and wall finishes were installed, creating one large learning resource center (library). Extensive interior alteration of the administrative offices (principal, teacher's lounge and kitchen, copy, and mail room) enlarged the space and installed new cabinetry and finishes.

1979: Seismic improvement removed the top third of the boiler room chimney

1983: Repair and maintenance to the roof, skylights, and cornice of the main building, and reroofing of the gymnasium

1992 Seismic retrofit

1999: Accessibility and Elevator

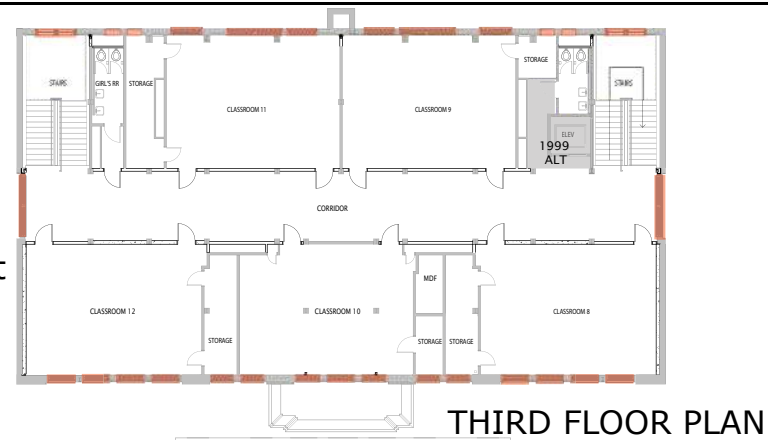
2002: Relocate classroom and cafeteria

2003: The north portion of the property was regraded to install the current sports field

2008: Detailed repair and refurbishment of wood windows

2016: HVAC Upgrade and floor plan alteration

2017: Seismic upgrade, along with the cafeteria built in 1972, covered playcourt, and ground floor plan altered where walls were added to cafeteria and kitchen to convert into classroom, and walls added to storage area to create office and storage closet.



1.3_Proposed Modification

This project proposes the refurbishment of the historic wood windows and replacement of glazing on all elevations of the McGilvra Elementary's original 1913 building. If budget allows, this project will also include refurbishment and glazing replacement for wood doors and fixed windows at the south elevation ground level as well as wood window refurbishment and glazing replacement at the 1940 addition. The goal of this proposal is to refurbish the historic wood windows to extend their service life and to replace the existing glazing with vacuum-insulated glazing units to significantly improve the thermal comfort of the school occupants and reduce exterior noise.

Along with the window refurbishment, currently broken or damaged doors will be refurbished to extend their service life, and door glazing will be replaced with vacuum insulated glazing units to improve the thermal comfort and reduce exterior noise.

Window/ Door frames, exterior casework, and interior millwork will be refurbished in the field, operable sash refurbishment and glazing replacement will occur in a shop environment.

Based on a mockup at a similar window condition at Gatewood Elementary School, due to the increased weight of the vacuum-insulated glazing, only the lower operable double-hung sashes will remain operable. Upper sashes will be rendered inoperable via mechanically attached wood blocking.

All non-historic protective, expanded, steel mesh currently installed on the ground-floor windows will be removed and will not be reinstalled.

Budget Priorities Matrix (Priorities listed in descending order)

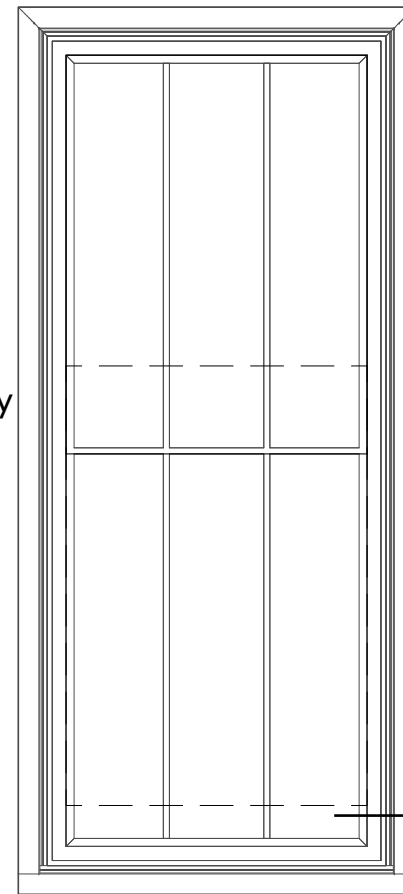
- Base bid 1913 windows
- 1913 Ground level doors and fixed window
- 1940 windows
- Remaining 1913 and 1940 doors and fixed windows

2.0_Scope of Work

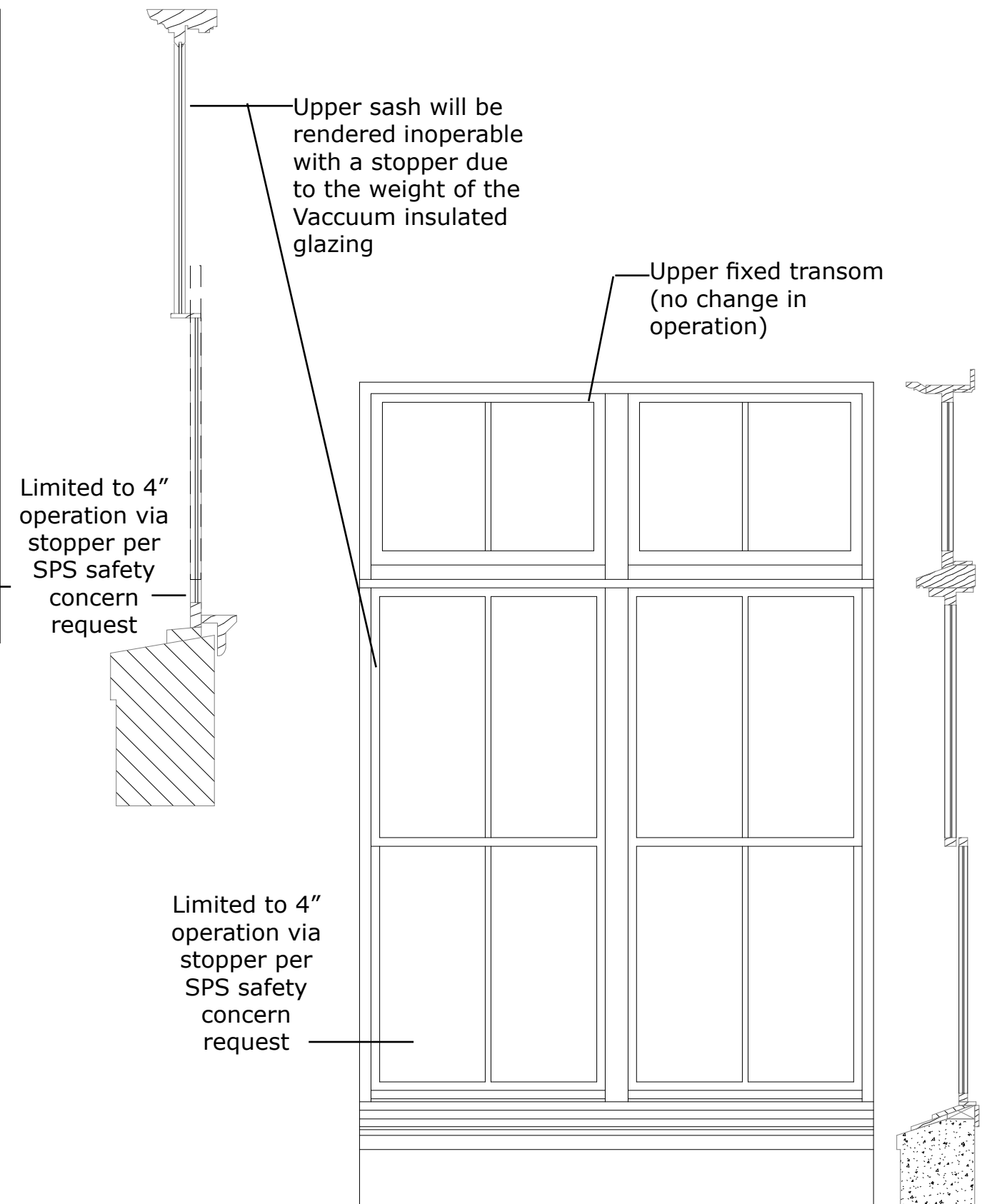
Proposed Scope of work Include:

1. Removal of sashes consistent with a developed site specific safety program.
2. The opening would have temporary painted OSB protection with 6 mil reinforced white plastic
3. The frame component trim/ casing pieces and non-historic elements would be removed if necessary, catalogued and documented for future reinstallation or disposal and replacement as appropriate.
4. The window frame would be treated in the field. The frames restoration consists of the following and covers from the exterior joint sealant to the interior sash slop of the bottom sash. All materials would be treated with "Board Defense" solution and have repairs made with the "Wood Care" epoxy repair system which includes "Rotfix" and "Sculptwood". The window subsill would be epoxy repaired if appropriate or replaced as required with clear vertical grained lumber miled to match original historic profiles.
5. As needed, new historic matched window components will be built and finished to match the original material in species, dimension, profile, and style of manufacture.
6. The sashes would be thoroughly inspected and have selective areas of paint shipped to accommodate repairs. All materials would be treated with Board defense solution and have repairs made with "Wood Care" epoxy repair system which includes "Rotfix and Sculptwood". The sashes would then be feather sanded prepped and primed.
7. New glass consisting of 5/16 inch (8mm) thick LuxWall vacuum sealed insulated glazing consisting of the following:
 - Outdoor Lite: Cardinal Clear Glass with LowE 270 on glass face 2
 - Indoor Lite: Cardinal Clear Glass
8. The sashes weatherstrip would be inspected and repaired or replaced
9. All Broken hardware that can be replaced would be replaced and refurbished. Broken or missing hardware would be replaced with either a solid cast, available product that is a match
10. Finish paint and interior finish would be installed to sashes
11. Joint sealant would be installed at perimeter of frame and trim.
12. Final paint would be installed to frames
13. All sashes would be returned to the site and installed in the prepared openings. Note: The understanding is that the upper double hung sash would be rendered inoperable due to weight of the Vacuum Insulated Glazing unit.
14. The lower double hung operable sash will be limited to 4 inch operation via a stopper per Seattle Public School request due to safety concerns
15. All touch-up and final adjustment would be made on site.

Note: Other than potential replacement of deteriorated wood components and paint, the intent is to perform refurbishment rather than modification or replacement of historic elements and allow the work performed to be reversable.

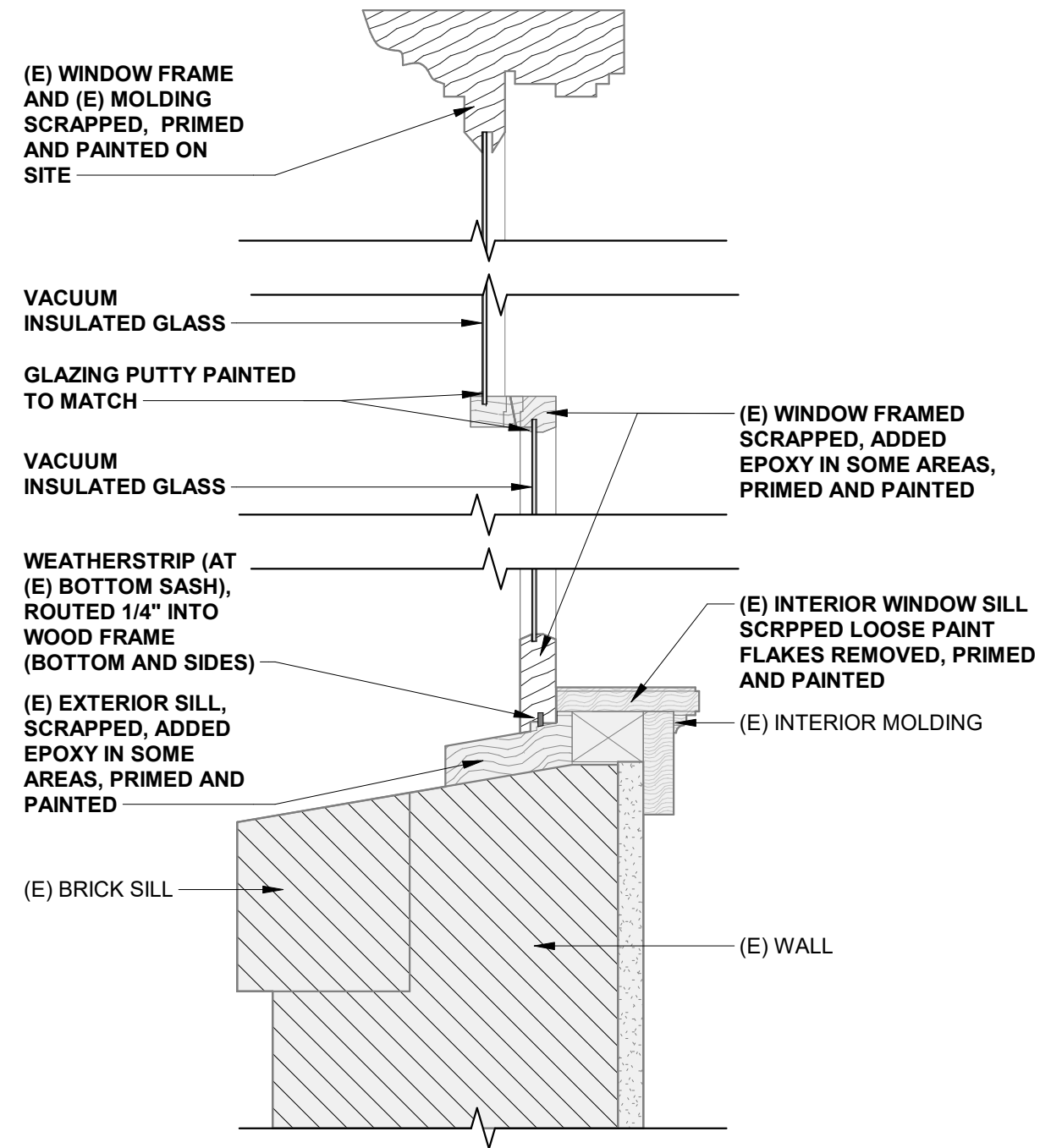
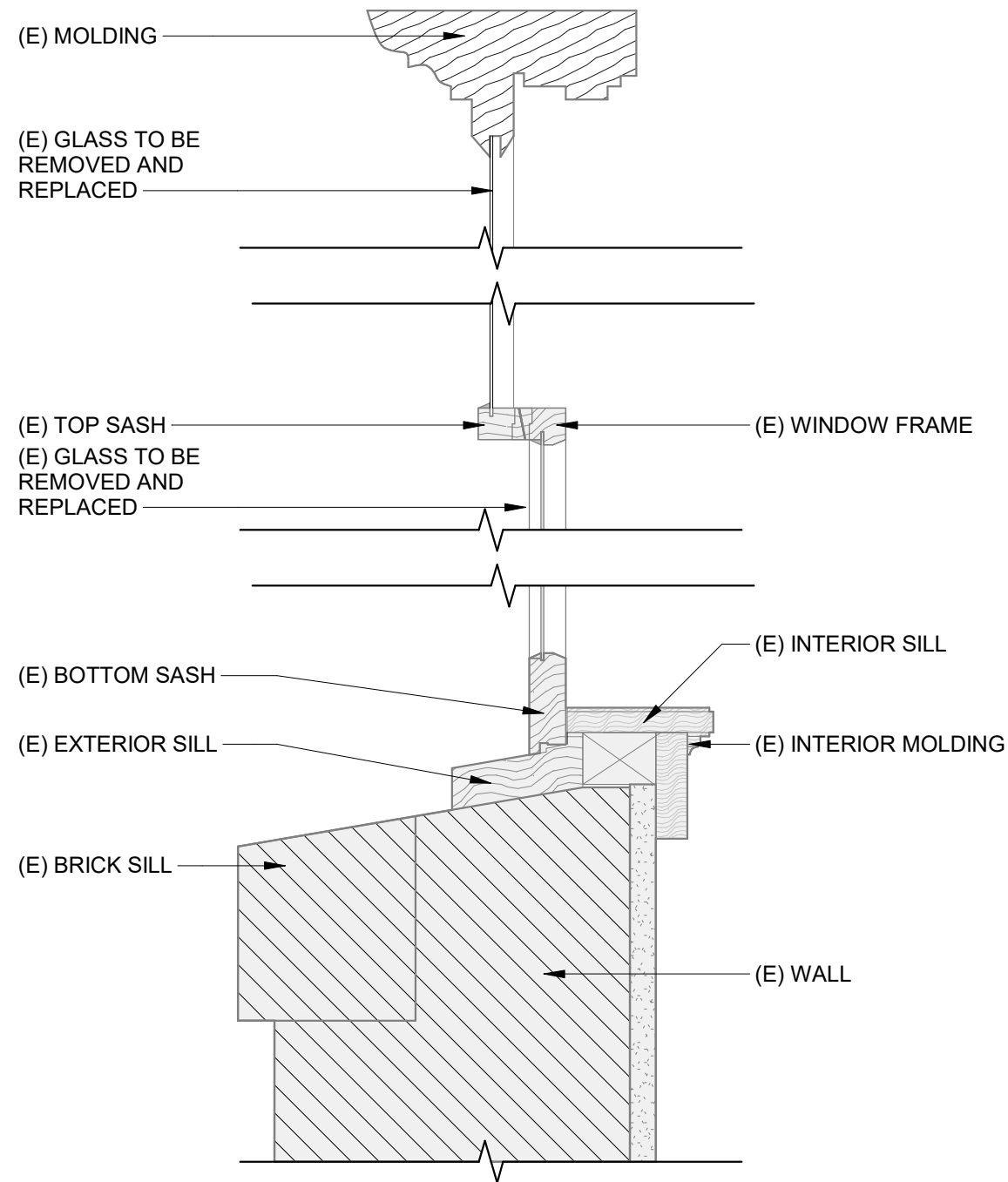


1913 WINDOW



1940 WINDOW

2.1_Detail



3.0_Condition Survey

ELEVATION-OVERALL NOTES:

Based on the landmark report, the wood windows were repaired and refurbished in 2008. The windows on the second and third floors are generally in good condition, with some damage/ weathering observed on the sills due to its skyward facing nature. The ground floor windows are covered with protective, expanded, steel mesh, causing leaves and debris to fill the window casing cavity, retaining water, resulting in the wood sill and vertical elements adjacent to the sill being damaged.

The 1940 wood windows have more damage due to the protective steel mesh, fastening to the vertical jamb.

The South double doors from the playfield are falling apart with cracks in the panels with daylight coming through.



East Elevation



South Elevation

GENERAL NOTES

- Non historic, protective, expanded steel mesh currently installed on ground floor windows collect organic debris and has increased deterioration at attachment points, sills and lower sashes.
- All windows are single-paned and fall beneath current energy code requirements and accoustical standards.

COMPLETELY FAILING COMPONENTS

Damaged wood/ Complete Paint Failure, i.e. current condition will not accept paint repairs; Significant Wood deterioration or damage. Fenestrations with a significant amount of wood components that cannot be repaired by any means short of full wood component replacement.

EXTENSIVE DAMAGE

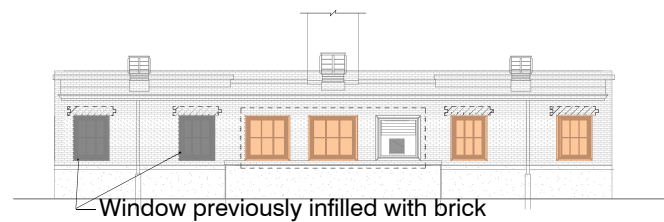
Areas of Paint Failure, i.e. current condition will accept paint repairs; Extensive Wood deterioration. Fenestrations with a significant amount of wood components that have extensive rot at least 1/4 inch deep or greater, black water staining, and other wood damage. Some bottom rails and Vertical muntins may require epoxy repairs.

MODERATE DAMAGE

Areas of Paint Failure, i.e. current condition will accept paint repairs; Heavy to Moderate Wood Deterioration in spot locations. Fenestrations with some damage components, age related deterioration, and or failing paint coatings, spot locations of rotted wood, but without any wood components that likely require replacement.

MINOR DAMAGE

Paint is intact/ recently refurbished. Minor Damage. Fenestrations with intact paint and some minor damage in spot locations. These windows have been repaired or refurbished within the last 15 years



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- Non historic, protective, expanded steel mesh currently installed on ground floor windows collect organic debris and has increased deterioration at attachment points, sills and lower sashes.
- All windows are single-paned and fall beneath current energy code requirements and accoustical standards.

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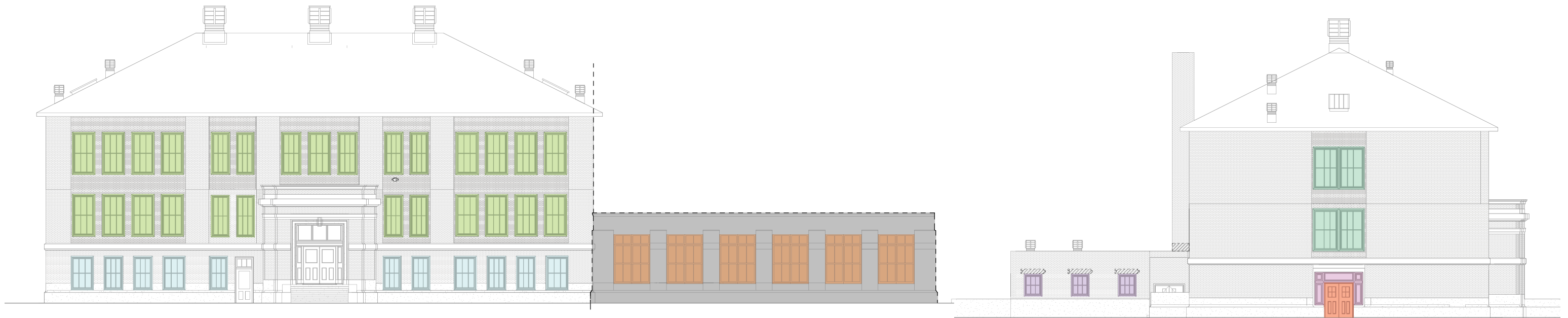
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3.1_Window Types/ Condition Photos



W1.1

Level 1
Double hung windows with protective expanded steel mesh at 1913 Building



W2.1

Level 2-3
Double hung windows at Classrooms



W1.2

1940 Level 1
Two operable, two over two single-hung with two, fixed two-light sash with wire grilles



W2.2

Level 2-3
Double, Double hung windows at corridor



D1

Level 1
Double Wood Door with half lite, relites and transoms.



W1.3

Level 1
Boiler Room and Restroom Double Hung windows with wire grilles

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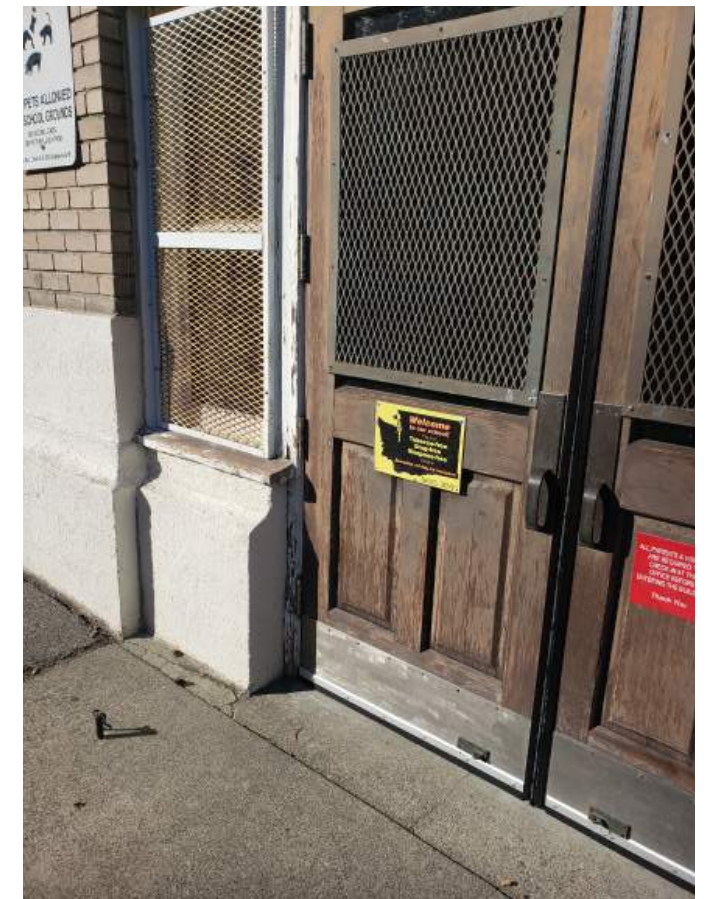
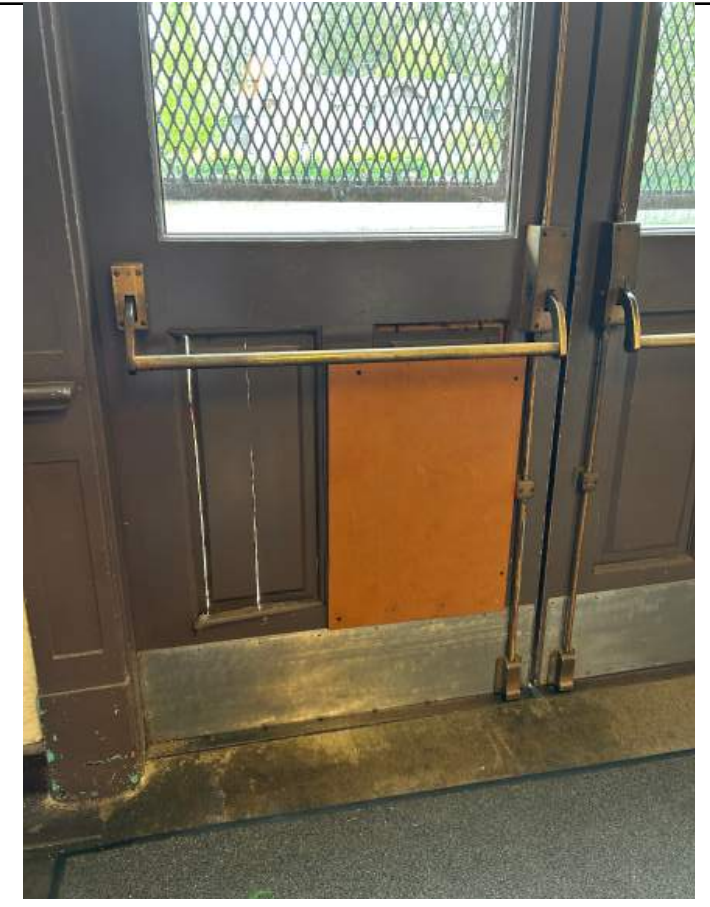


SOUTH CORRIDOR DOUBLE DOOR:

The wood double doors are falling apart with cracks in the panels with daylight coming through and boards attached to the interior side as a temporary repair. The door frame shows heavy deterioration especially at base where it is in contact with the concrete slab.

The Relite sill is heavily deteriorated due to being in contact with the concrete wall below and skyward facing nature of the sill. The protective, expanded, steel mesh, causing leaves and debris to fill the window casing cavity, retaining water, resulting in the wood sill and vertical elements adjacent to the sill being damaged.

The transom also has similar damage due to smaller casing area for debris to collect within the protective, expanded, steel mesh, and further weathering due to its south facing orientation

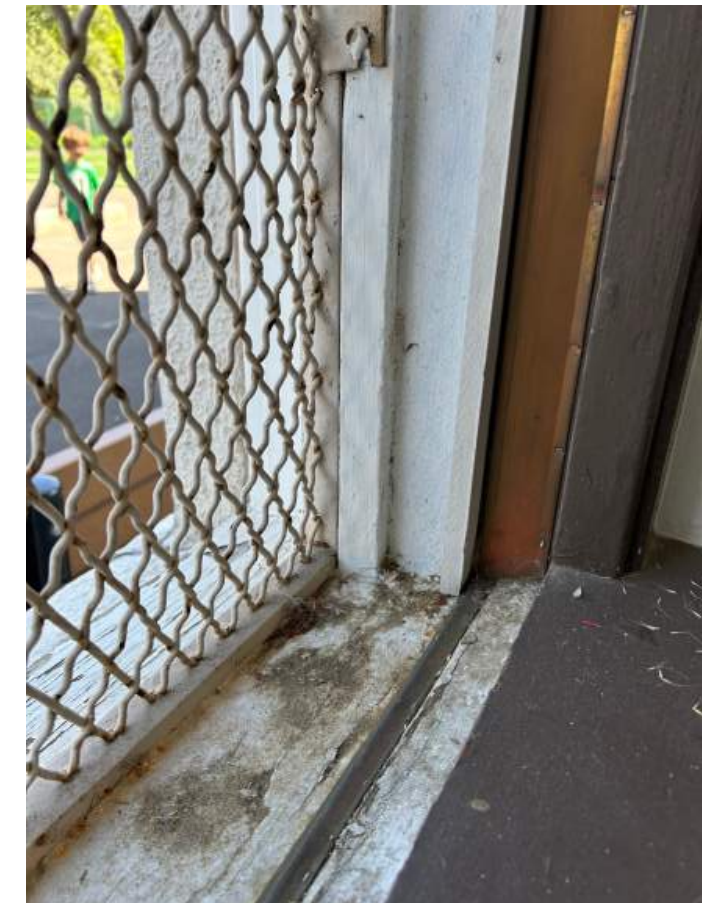




1913 GROUND FLOOR CLASSROOM WINDOWS:

The 1913 Ground floor, classroom windows have the protective expanded steel mesh on the exterior. The exterior window sill has moderate damage due to its skyward facing nature.

The interior case work shows some signs of wear, with chips or scratches in the paint, but overall is in good condition.



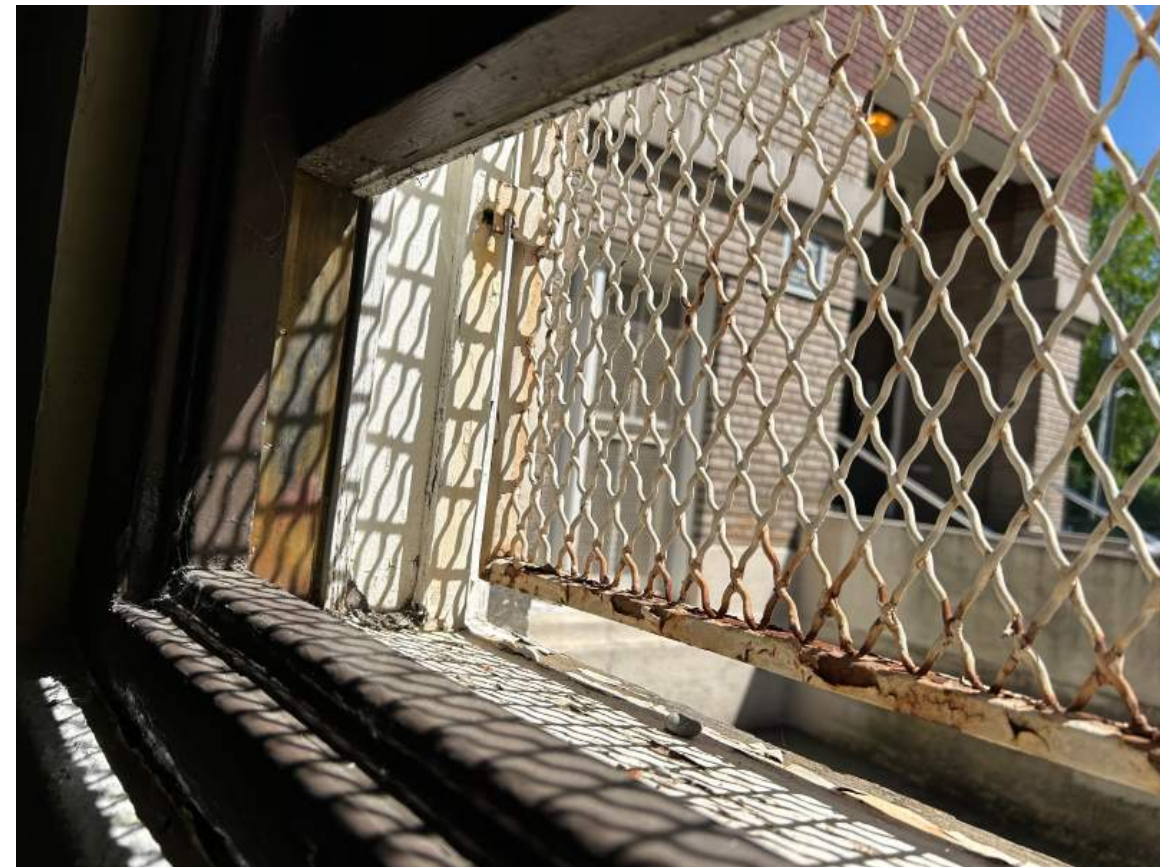
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GROUND FLOOR RESTROOM WINDOWS:

The restroom/ boiler room windows at the 1913 projecting one story building at the rear are heavily deteriorated at the sill due to the smaller window area and the protective, expanded, steel mesh, causing leaves and debris to fill the window casing cavity. Resulting in rotted sills in select locations.

The interior window casement has some chips in the paint with some wear but overall, is in good condition.

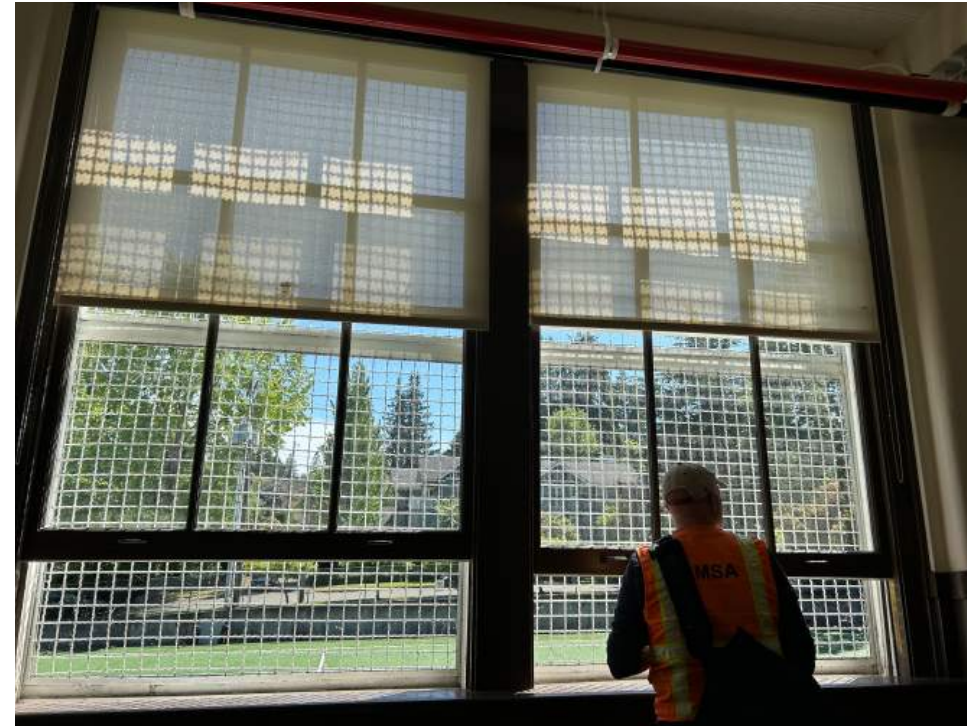


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1913 CORRIDOR WINDOWS:

The 1913 corridor windows at the south end have the protective expanded steel mesh on the exterior. The South exterior window sill has moderate damage due to its skyward facing nature and southern exposure, while the North corridor window sill is in good condition.

The interior case work shows some signs of wear, with chips or scratches in the paint, but overall is in good condition.



McGilvra Elementary-Historic Wood Window Refurbishment & Glazing Replacement

1913 SECOND AND THIRD FLOOR CLASSROOM WINDOWS:

The 1913 second and third floor, classroom windows are in decent condition. The exterior window sill has some damage due to its skyward facing nature but the exterior jamb show minimal weathering.

The interior case work shows some signs of wear, with chips or scratches in the paint, but overall is in good condition.

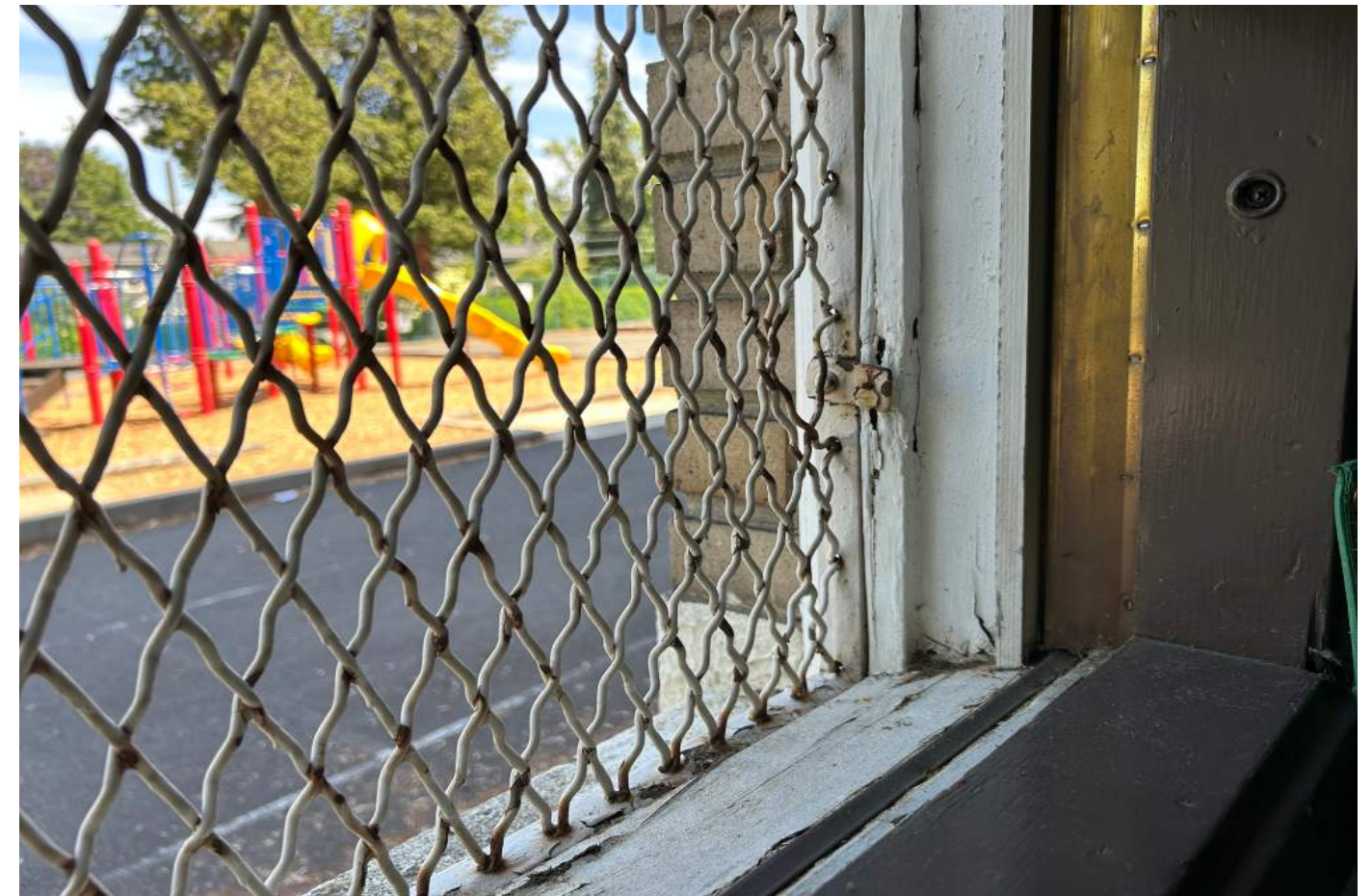




1940 WINDOWS:

The 1940 classroom windows have the protective expanded steel mesh on the exterior. As a result of the attachment method of the steel mesh, there is some damage to the exterior wood jambs. The exterior window sill has some damage due to its skyward-facing nature.

The interior case work shows some signs of wear, with chips or scratches in the paint, but overall is in good condition.





1913 DOOR, SIDE LITE, AND TRANSOMES

The 1913 Entry, wood double doors, sidelights, back double doors are in moderate condition, protected from the weather but have some weathering due to its use.

The transoms, thanks to their position, are in good condition with some wear visible in the paint.



4.0_Product

Mock-up Glass:

1. Vacuum Insulated Glazing that will be installed is 8mm (5/16") and includes LowE²-270 on glass face #2. This provides an R-value of R-15.87 and SHGC of 0.35



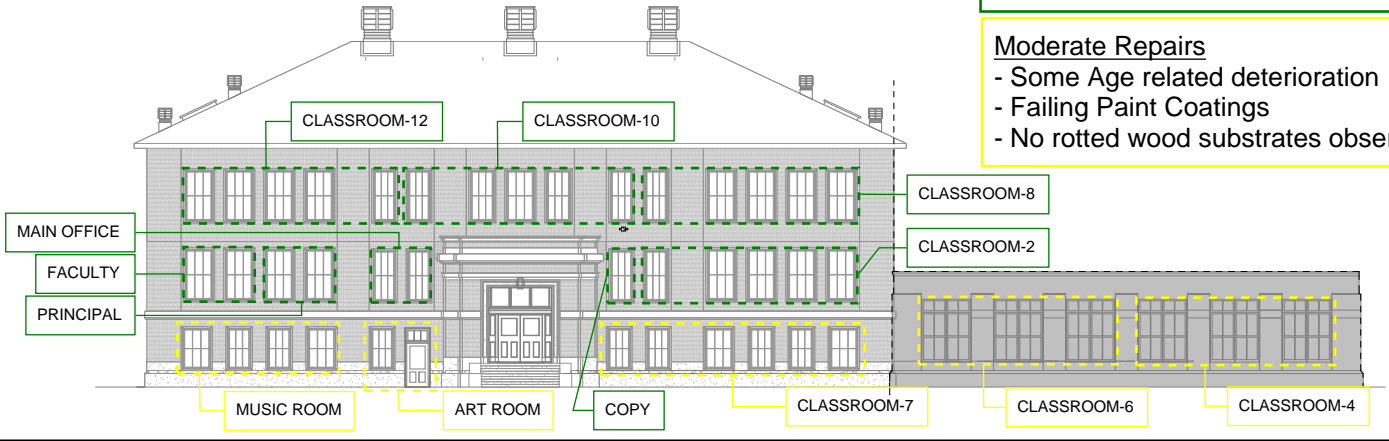
| | | |
|---|---|---|
| R-18 Center of Glass LoE ³ - 366 | 77 Condensation Resistance Factor | 33+ Sound Transmission Coefficient |
| 8 to 12-mm Entermal Thickness | 4.6 kg/ft² Embodied Carbon Emissions | 20-year Product Warranty |

| 5-mm/5-mm | Visible Light Transmittance | Exterior Reflectance | Fading UV | Fading ISO | SHGC COG | U-factor COG |
|------------------------|-----------------------------|----------------------|-----------|------------|----------|--------------|
| LoE - 180 | 78% | 14% | 26% | 61 | 0.67 | 0.084 |
| LoE ² - 270 | 69% | 12% | 13% | 50 | 0.35 | 0.063 |
| LoE ³ - 366 | 64% | 11% | 5% | 42 | 0.26 | 0.056 |
| LoE ³ - 340 | 38% | 13% | 2% | 27 | 0.16 | 0.056 |

Entermal[®] Performance

**APPENDIX-B CONDITIONS PHOTOS
McGILVRA ELEMENTARY SCHOOL**

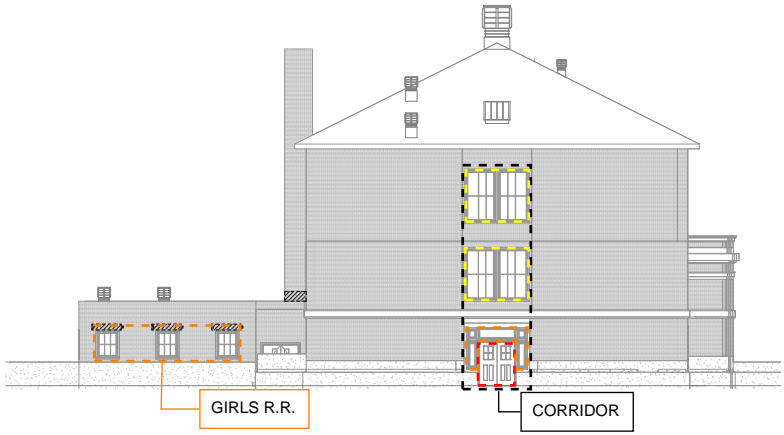
EAST ELEVATION



Minor Repairs
- Refurbished in the last 20 years
- Minor paint Damage

Moderate Repairs
- Some Age related deterioration
- Failing Paint Coatings
- No rotted wood substrates observed

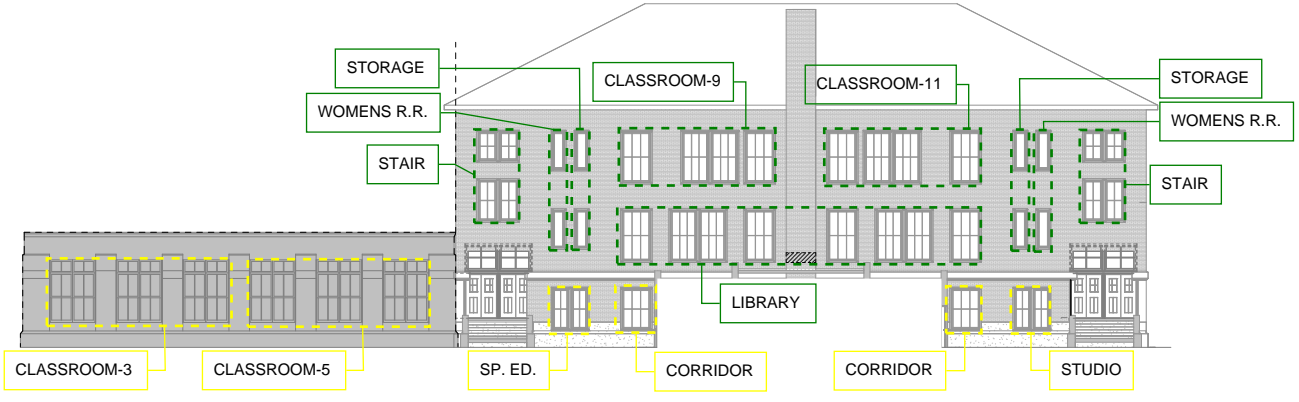
SOUTH ELEVATION



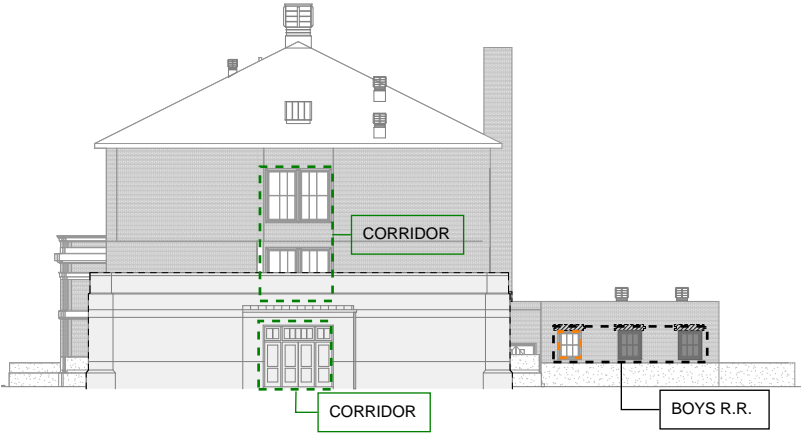
Heavy Repairs
- Age related deterioration
- Failing Paint Coatings
- 1/4 inch deep soft/ rotted wood substrates observed. Select areas of soft/ rotted wood greater than 1/4 inch

Extensive Repairs
- Failing Paint Coatings
- 1/4 inch deep and greater soft/ rotted wood substrates observed. Some components should be replaced

WEST ELEVATION



NORTH ELEVATION



SOUTH CORRIDOR

All windows were repaired and refurbished in 2008. The south facing corridor windows have protective expanded steel mesh on the exterior. The jamb has loose inner bead with some failing paint at the jamb adjacent to the sill. The sill has moderate damage due to its skyward facing nature and southern exposure.



The metal jamb frame is in good condition

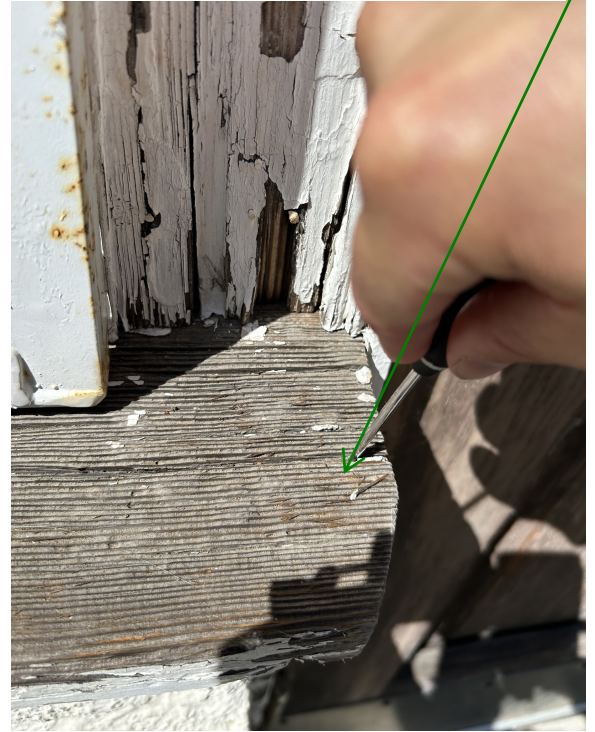


The Interior case work shows some signs of wear, with chips and scratches in the paint but overall is in good condition

SOUTH ENTRY DOOR

The South Entry Double door requires extensive repair due to its southern exposure without any protection.

The sidelite and transome frames have heavy damage, where paint is faded and the wood sill is splitting with gaps,



The door panel has cracks in the panels with daylight coming through and plywood attached to the interior side to hold the panels in place. Heavy weathering of the door due to its southern exposure with faded paint. Interior side has brass hardware. Unknown whether hardware is original or historic.



1913 Ground floor, classroom windows have protective expanded steel mesh on the exterior. There are some damage to the wood window frame where the expanded steel mesh is attached. The exterior window sill has moderate damage due to its skyward facing nature. Some wear observed at base of jamb and sill intersection.

1ST FLOOR RESTROOM



The restroom window sills at the 1913 projecting one story building at the rear are rotted due to the protective expanded, steel mesh and smaller window area causing leaves and debris to fill the window cavity.



1940 Ground floor, classroom windows have protective expanded steel mesh on the exterior. There are some damage to the wood window frame where the expanded steel mesh is attached along with chips in the paint on the jambs. The exterior window sill has moderate damage due to its skyward facing nature.



The Second floor Library window are in fair condition with minor chips in the paint observed on the jambs and some damage observed on the exterior sill due to its skyward facing nature.



Faded paint on the exterior window sills



Minor chips and wear on jambs and window frame



Faded exterior window sill paint due to skyward facing nature



hooks attached to window sill



Previously replaced window glazing



Interior case woks in good condition with some chips or scratches in the paint

STORAGE



Interior Casework of storage window in good condition. Exterior sill has faded paint due to skyward facing nature but jambs are in good condition with some weathering at the base where it intersects sill.





Interior casework and paint in good condition



moderate weathering on exterior window sill.



Existing groove in window sash to be used to install weatherstripping

1ST FLOOR DOORS, ART AND MUSIC ROOM



Exterior paint is faded



Interior paint, frame, trim and door panel is in good condition.



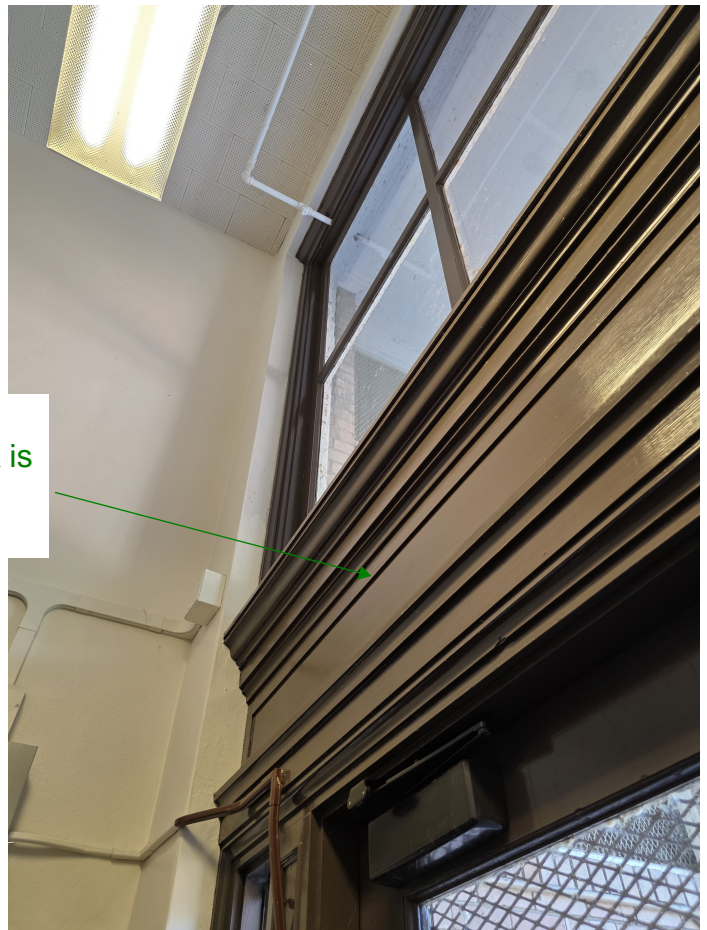
South East, ground floor corner door at music room was infill in 2002 when cafeteria was relocated



MAIN ENTRY



Interior casework is in good condition



Hardware different from other doors are on main entry door. Traces of previous hardware removed remain



Exterior of Entry double door and side-lite appear to be in good condition, protected from the weather by entry protrusion. The paint appears faded due to its consistent use over the years

BACK DOORS



Brass door hardware. Unknown whether they are original or historic match. Back double door interior side is in good condition with some scratches to the paint

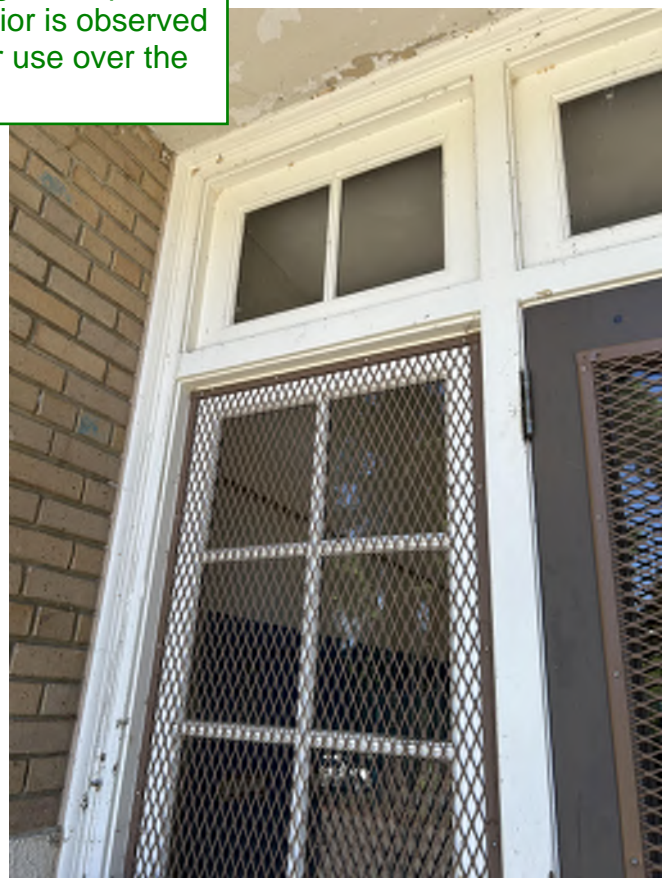


Exterior of Back double door and transom is in good condition, protected from the weather by doors setback with floor above providing protection from the elements. The paint appears faded due to its consistent use over the years.

1940 NORTH ENTRY

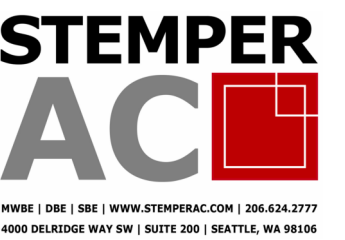


The 1940, North entry double door, side lite and transom are in good condition due to being set back and protected from the elements and its orientation to the North. Some fading of the paint on the exterior is observed from regular use over the years.



MCGILVRA ELEMENTARY WOOD WINDOW & DOOR REPAIRS

PROJECT # P2216



CODE SUMMARY

CODE SUMMARY:
 JURISDICTION: CITY OF SEATTLE
 BUILDING CODE: 2021 SEATTLE BUILDING CODE
 FIRE CODE: 2021 SEATTLE FIRE CODE
 ENERGY CODE: 2021 WASHINGTON STATE ENERGY CODE
 MECHANICAL CODE: 2021 SEATTLE MECHANICAL CODE
 PLUMBING CODE: 2021 SEATTLE PLUMBING CODE
 ELECTRICAL CODE: 2021 SEATTLE ELECTRICAL CODE
 ADA CODE: 2010 ADA STANDARDS AND A117.1-2009

VOLUNTARY SEISMIC UPGRADES UNDER SEPARATE PERMIT# 7138679-CN

GENERAL NOTES

- ALL WORK TO BE PERFORMED IN COMPLIANCE WITH ALL APPLICABLE CODES, LAWS AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION OVER THE WORK.
- CONTRACTOR IS TO PROTECT EXISTING LANDSCAPE SCHEDULED TO REMAIN, PARKING LOTS, GROUNDS, FLOORS, FURNISHINGS, FIXTURES AND EQUIPMENT FROM DAMAGE. CONTRACTOR TO USE EXTREME CAUTION WHEN WORKING ON GROUNDS AND PARKING LOTS ADJACENT TO THE BUILDING. CONTRACTOR TO REPLACE IN KIND ANY SUCH ITEMS DAMAGED.**
- CONTRACTOR TO VERIFY ALL DIMENSIONS, PROPERTY LINES, MEASUREMENTS AND CONDITIONS IN THE FIELD BEFORE BEGINNING WORK. ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IMMEDIATELY.
- THE ARCHITECT WILL HAVE A REPRESENTATIVE ON SITE, PART-TIME TO OBSERVE THE CONSTRUCTION FOR COMPLIANCE WITH THE DESIGN INTENT AND TO ASSIST THE CONTRACTOR IN RESOLVING VARIATIONS IN THE EXISTING CONSTRUCTION. THESE DOCUMENTS ADDRESS KNOWN CONDITIONS, BUT IT IS ANTICIPATED THAT HIDDEN CONDITIONS WILL BE ENCOUNTERED DURING CONSTRUCTION. THE ARCHITECT WILL OBSERVE ALL SUCH HIDDEN CONDITIONS AND ISSUE CLARIFICATIONS OR MODIFICATIONS OF THE DESIGN INTENT TO ADDRESS SUCH CONDITIONS AND WILL DOCUMENT ALL CHANGES.
- UNLESS OTHERWISE NOTED, ALL ANGLES ARE TO BE RIGHT ANGLES, ALL LINES WHICH APPEAR PARALLEL ARE TO BE PARALLEL, AND ALL ITEMS WHICH APPEAR CENTERED ARE TO BE CENTERED. CONTRACTOR TO BE RESPONSIBLE FOR MAINTAINING ALL LINES TRUE, LEVEL, PLUMB AND SQUARE.
- DETAILED AND/OR LARGER SCALE DRAWINGS TAKE PRECEDENCE OVER GENERAL AND SMALLER SCALE DRAWINGS. POSTED DIMENSIONS WILL TAKE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTOR TO VERIFY SCALED DIMENSIONS WITH ARCHITECT BEFORE PROCEEDING WITH WORK.
- ALL ATTACHMENTS, CONNECTIONS, AND FASTENINGS OF ANY NATURE ARE TO BE PROPERLY AND PERMANENTLY SECURED IN CONFORMANCE WITH THE BEST PRACTICES OF THE BUILDING INDUSTRY. DRAWINGS SHOW ONLY SPECIAL REQUIREMENTS TO ASSIST THE CONTRACTOR AND DO NOT SHOW EVERY DETAIL.
- DETAILS SHOWN IN THESE DRAWINGS ARE TYPICAL AND WILL APPLY UNLESS OTHERWISE NOTED OR SHOWN. DETAILS OF CONSTRUCTION NOT FULLY SHOWN ARE TO BE OF THE SAME NATURE AS THOSE DRAWN FOR SIMILAR CONDITIONS. ANY AREAS IN QUESTION TO BE ADDRESSED AT PRE-CONSTRUCTION CONFERENCE.
- CONTRACTOR TO PROTECT EXISTING FURNISHINGS, FIXTURES, EQUIPMENT AND LANDSCAPING FROM DAMAGE. CONTRACTOR TO REPLACE IN KIND ANY SUCH ITEMS DAMAGED. ALL DEBRIS IS TO BE REMOVED.
- CONTRACTOR TO COORDINATE ALL OPERATIONS WITH OWNER, INCLUDING: SITE ACCESS, MATERIALS STORAGE AND STAGING, INTERRUPTIONS OF ELECTRICAL, MECHANICAL, FIRE-ALARM, LOW-VOLTAGE SERVICES AND TIMING OF NOISY OR DISRUPTIVE OPERATIONS. CONTRACTOR TO VERIFY SEQUENCE OF WORK WITH OWNER.
- CONTRACTOR IS RESPONSIBLE FOR CUTTING/ WELDING AND HOT WORK PERMITS AND MUST MEET THE CITY OF SEATTLE FIRE DEPARTMENT STANDARDS FOR SUCH WORK.
- REFER TO SECTION 01 11 00 FOR INFORMATION ON HAZARDOUS MATERIALS IMPACTS INCLUDED IN THE WORK.
- IF HAZARDOUS MATERIALS ARE ENCOUNTERED, NOTIFY ARCHITECT IMMEDIATELY.

| SHEET NUMBER | SHEET NAME |
|------------------------|--------------------------------|
| T-1.0 | TITLE SHEET - SEISMIC UPGRADES |
| ARCHITECTURAL DRAWINGS | |
| A-0.0 | SITE PLAN |
| A-2.0 | ELEVATIONS |
| A-2.1 | ELEVATIONS |
| A-5.0 | WINDOW AND DOOR SCHEDULE |

SITE AND BUILDING DATA

SITE ADDRESS: 1617 38TH AVE E SEATTLE, WA 98112

ASSESSOR'S PARCEL NO.: 531810-0820

LOT AREA: 108,000 SF

ZONING: NR3

CONSTRUCTION TYPE: II-A

NUMBER OF STORIES: 3 STORY EXISTING

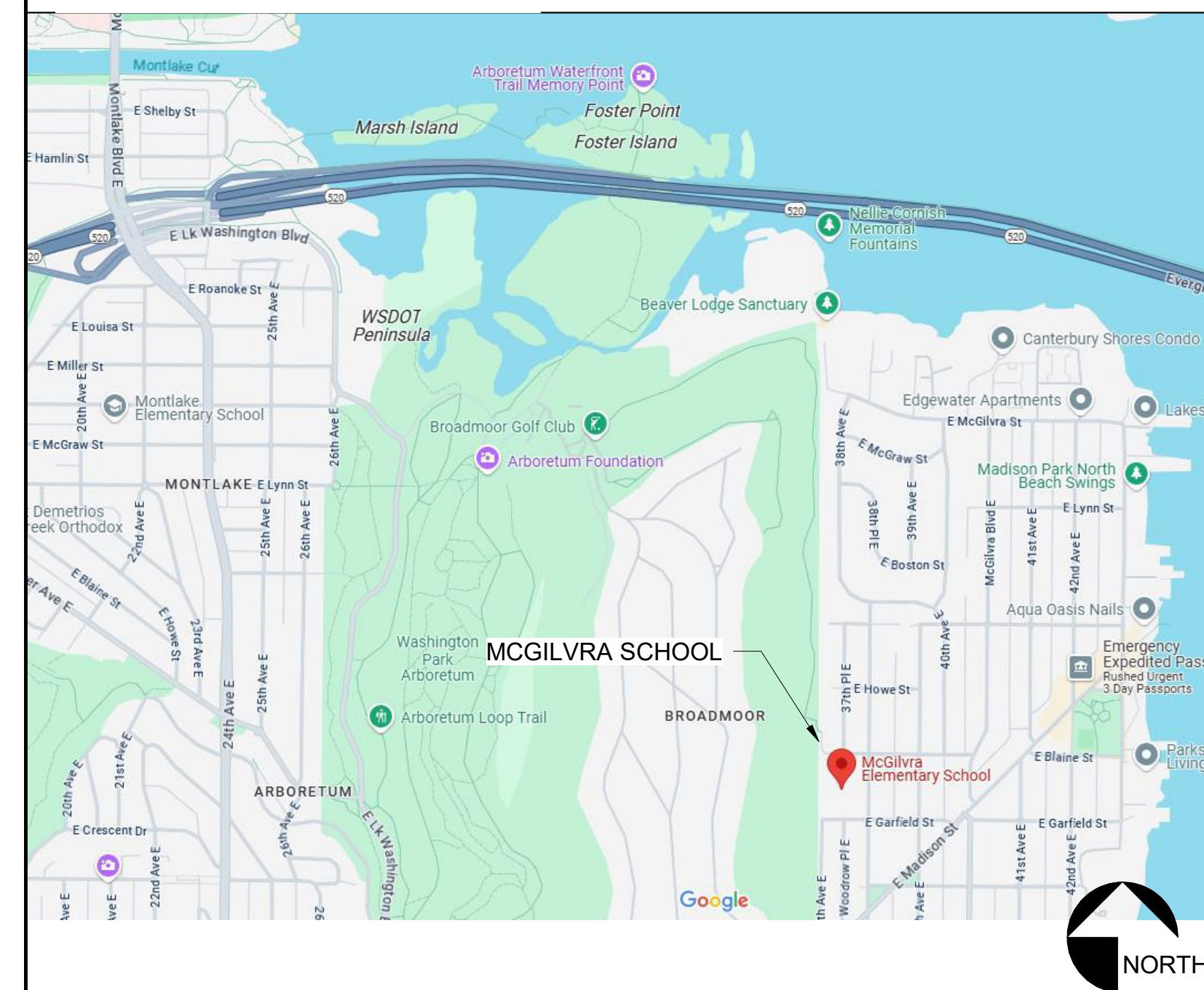
PARKING: NO CHANGE

LEGAL DESCRIPTION: MC GILVRAS J J 3RD ADD REPLAT & VAC ALLEY ADJ & VAC ST ADJ LOTS 1 THRU 12 Plat Block: 7 Plat Lot: 1 THRU 24

ABBREVIATIONS

| | | | |
|--------------|---|---------|--------------------------------------|
| & | AND | MAX | MAXIMUM |
| @ | AT | MECH | MECHANICAL |
| AB | ANCHOR BOLT | MANUF | MANUFACTURER |
| ACT | ACOUSTICAL CEILING TILE | MTL | METAL |
| ADJ | ADJACENT | MIN | MINIMUM |
| AFF | ABOVE FINISHED FLOOR | N/A | NOT APPLICABLE |
| ALUM | ALUMINUM | NIC | NOT IN CONTRACT |
| ANOD | ANODIZED | NO | NUMBER |
| APPROX | APPROXIMATE (LY) | NR | NOT RATED |
| ARCH | ARCHITECTURE (URAL) | NTS | NOT TO SCALE |
| ASPH | ASPHALT | OC | ON CENTER |
| ASSY | ASSEMBLY | OF CI | OWNER FURNISHED/CONTRACTOR INSTALLED |
| ALT | ALTERNATE | OH | OVERHEAD |
| BLDG | BUILDING | OVHG | OVERHANG |
| BLKG | BLOCKING | PL | PLATE |
| BM | BEAM | PLAS | PLASTER |
| BO | BOTTOM OF | PNT | PAINT |
| BOT | BOTTOM | PSI | POUNDS PER SQUARE INCH |
| CJ | CONTROL JOINT | PT | PRESSURE TREATED |
| CLG | CEILING | PVC | POLYVINYL CHLORIDE |
| CMU | CONCRETE MASONRY UNIT | PLYW | PLYWOOD |
| COL | COLUMN | RCP | REFLECTED CEILING PLAN |
| CONC | CONCRETE | RD | ROOF DRAIN |
| CONT | CONTINUOUS | RE: | REFER TO |
| CS | CONCRETE SEALER | REQD | REQUIRED |
| CT | CERAMIC TILE | RM | ROOM |
| CTSK | COUNTERSINK | RWL | RAIN WATER LEADER |
| DBL | DOUBLE | SCHED | SCHEDULE |
| DEMO | DEMOLISH | SC | SOLID CORE |
| DIA | DIAMETER | SEC | SECURITY |
| DN | DOWN | SF | SQUARE FEET |
| DS | DOWN SPOUT | SHEATH | SHEATHING |
| DWGS | DRAWINGS | SHT | SHEET |
| EA | EACH | SIM | SIMILAR |
| E-A | EXISTING ANCHOR | SP | STAND PIPE |
| ELEC | ELECTRICAL | SPEC | SPECIFICATION |
| ELEV OR EL | ELEVATION | SQ | SQUARE |
| EQ | EQUAL | SS | STAINLESS STEEL |
| EXIST OR (E) | EXISTING | STD | STANDARD |
| FD | FLOOR DRAIN | STL | STEEL |
| F.F.GSM | FACTORY FINISHED GALVANIZED SHEET METAL | STOR | STORAGE |
| F.O.I.C. | FURNISHED BY OWNER, INSTALLED BY CONTRACTOR | STRUCT | STRUCTURAL |
| FT | FIRE TREATED | SUSP | SUSPENDED |
| GA | GAUGE | TOC | TOP OF CONCRETE |
| GALV | GALVANIZED | TOP | TOP OF PARAPET |
| GL | GLASS | TOS | TOP OF STEEL |
| GWB | GYPNUM WALL BOARD | TP | TYPICAL |
| GSM | GALVANIZED SHEET METAL | TS | TUBE STEEL |
| GYP | GYPNUM | UL | UNDERWRITERS LABORATORY |
| HGT | HEIGHT | UNO | UNLESS NOTED OTHERWISE |
| HM | HOLLOW METAL | VERT | VERTICAL |
| HORIZ | HORIZONTAL | VIF | VERIFY IN FIELD |
| HR | HOUR | VTR | VENT THROUGH ROOF |
| INT | INTERIOR | WI | WITH |
| INSUL | INSULATION | WF | WIDE FLANGE |
| LB OR # | POUND | WD | WOOD |
| LOC | LOCATION | WIN | WINDOW |
| MATL | MATERIAL | X BRACE | CROSS BRACE |
| | | YD | YARD |

VICINITY MAP



PROJECT DIRECTORY

| | | | | | |
|--|---|--|---|--|---|
| <p>OWNER SEATTLE PUBLIC SCHOOLS 2445 3rd Avenue South Seattle, WA 98124 CONTACT: Amanda Fulford, Vincent Gonzales PHONE: (206) 496-2561 asfulford1@seattleschools.org vrgonzales@seattleschools.org</p> | <p>ARCHITECT STEMPER ARCHITECTURAL COLLABORATIVE 4000 Delridge Way, SW, Suite 200 Seattle, WA 98108 CONTACT: Marc Tegen Scott Stemper PHONE: (206) 624-2777 marc@stemperac.com scott@stemperac.com</p> | <p>STRUCTURAL ENGINEER PCS STRUCTURAL SOLUTIONS 1011 Western Avenue, Unit 810 Seattle, WA 98104 CONTACT: Alex Lege Jared Dragovich PHONE: (206) 292-5076 alege@pcs-structural.com jdragovich@pcs-structural.com</p> | <p>GEO TECHNICAL ENGINEER GeoEngineers 17425 NE Union Hill Road, Suite 250 Redmond, WA 98052 CONTACT: Jose Estrada Senior Geotechnical Engineer, PE Christopher Newton Associate Geotechnical Engineer, PE Hamilton Puangnak</p> | <p>ENVELOPE CONSULTANT 4EA BUILDING SCIENCE 12721 30th Avenue NE, 2nd Floor Seattle, WA 98125 CONTACT: Jose Estrada Whitney Thomas PHONE: jose@team4ea.com whitney@team4ea.com</p> | <p>ENVIRONMENTAL CONSULTANT NOVO Laboratory & Consulting Services, Inc. 138 SW 154th Street, Suite B Burien, WA 98166 CONTACT: Rich Carlson PHONE: (206) 244-1060 rich@novolc.com</p> |
|--|---|--|---|--|---|

SCOPE OF WORK

- WOOD WINDOW & DOOR REPAIRS:**
- Base Bid 1913 Windows:**
 - Remove existing metal mesh screens at all windows where they occur.
 - Carefully remove existing wood stops and parting beads and disconnect ropes to facilitate temporary removal of existing double hung window sashes for off-site refurbishment.
 - Refurbish existing double hung window sashes and replace existing single pane glazing with vacuum insulated glazing.
 - Refurbish existing wood window frames in-place.
 - Reinstall refurbished double hung sashes with new wood stops and parting beads.
 - Additive Alternate-1, 1913 Ground Level Doors and Fixed Windows:**
 - Remove existing metal mesh screens at all windows and doors where they occur.
 - Carefully remove existing wood doors and hardware to facilitate temporary removal of existing doors and hardware for off-site refurbishment.
 - Refurbish existing door frames, fixed windows and window frames in-place.
 - Replace existing single pane door and window glazing with vacuum insulated glazing. Install laminated glazing in locations where existing glass is smaller than 12m x 18m.
 - Reinstall refurbished doors and hardware.
 - Additive Alternate-2, 1940 Windows:**
 - Remove existing metal mesh screens at all windows where they occur.
 - Carefully remove existing wood stops and parting beads and disconnect ropes to facilitate temporary removal of existing double hung window sashes for off-site refurbishment.
 - Refurbish existing double hung window sashes and replace existing single pane glazing with vacuum insulated glazing.
 - Refurbish existing wood window frames in-place.
 - Reinstall refurbished double hung sashes with new wood stops and parting beads.
 - Additive Alternate-3, Remaining 1913 and 1940 Doors and Fixed Windows:**
 - Remove existing metal mesh screens at all windows and doors where they occur.
 - Carefully remove existing wood doors and hardware to facilitate temporary removal of existing doors and hardware for off-site refurbishment.
 - Refurbish existing door frames, fixed windows and window frames in-place.
 - Replace existing single pane door and window glazing with vacuum insulated glazing. Install laminated glazing in locations where existing glass is smaller than 12m x 18m.
 - Reinstall refurbished doors and hardware.

MCGILVRA ELEMENTARY SCHOOL
 WOOD WINDOW & DOOR REPAIRS
 1617 38TH AVE E,
 SEATTLE, WA 98112

| | |
|------------|----------|
| PERMIT SET | 6/2/2026 |
|------------|----------|

| REVISIONS | |
|-----------|------|
| # | DATE |
| | |

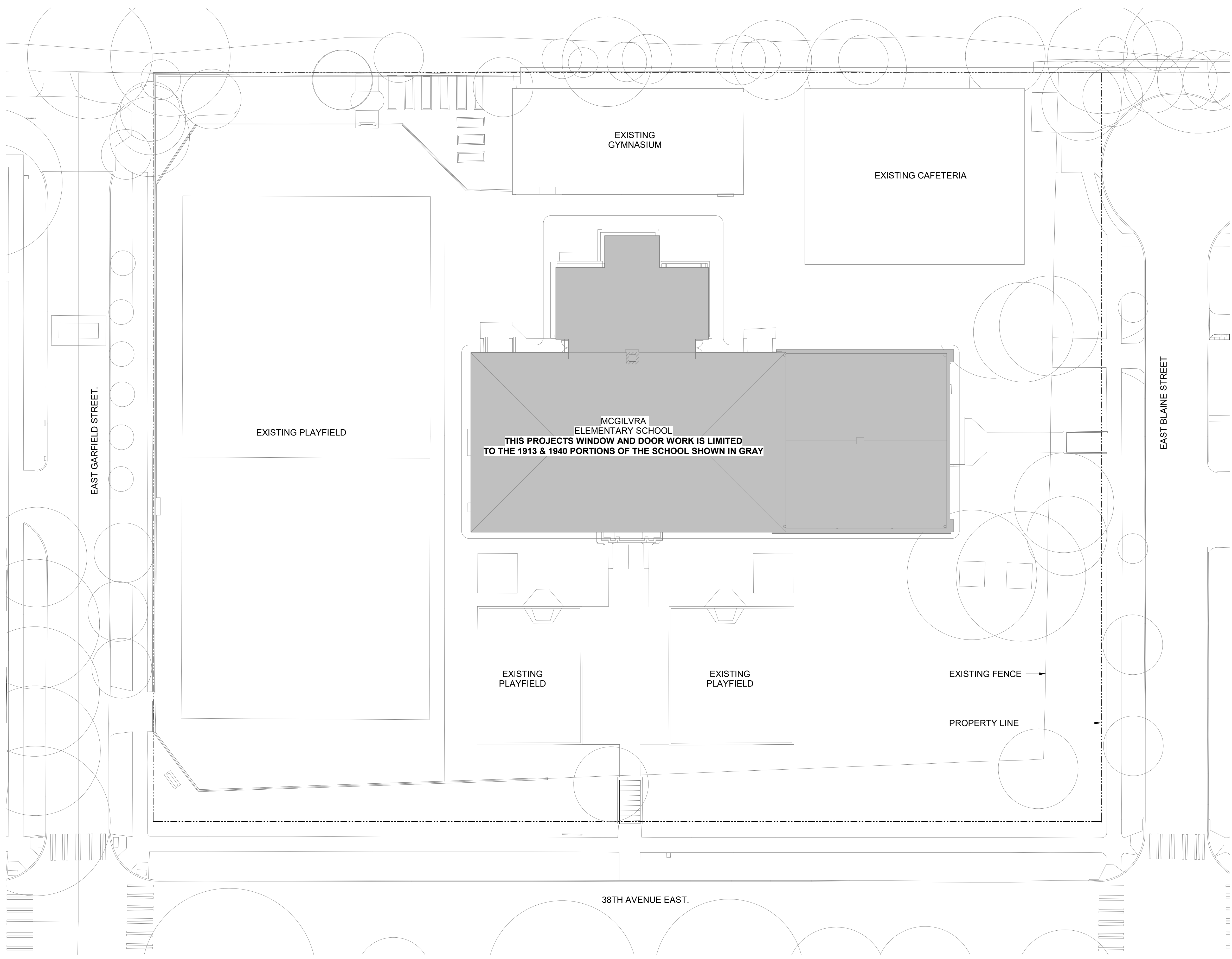
| |
|-------------------|
| PROJECT ARCHITECT |
| PROJECT MANAGER |
| DRAWN |
| MAT |

TITLE SHEET -
WOOD WINDOWS AND DOORS

T-1.1
 P2216

| SITE & BUILDING DATA | |
|--|--------------------------------------|
| BUILDING NAME: | MCGILVRA ELEMENTARY SCHOOL |
| SITE ADDRESS: | 1617 38TH AVE E SEATTLE, WA 98112 |
| ASSESSOR'S PARCEL NO: | 531810-0820 |
| LEGAL DESCRIPTION: | |
| MC GILVRAS J J 3RD ADD REPLAT & VAC ALLEY ADJ & VAC ST ADJ LOTS 1 THRU 12 Plat Block: 7 Plat Lot: 1 THRU 24 | |
| OWNER: | |
| SEATTLE PUBLIC SCHOOLS MS 22-331, PO BOX 34165 SEATTLE, WA 98124 PHONE: (206) 252-0151 | |

GENERAL NOTE:
THIS PROJECT DOES NOT INCLUDE ANY SITE RELATED WORK. CONTRACTORS STAGING, LAYDOWN AREAS, USE OF LIFTS, OR USE OF OTHER EQUIPMENT SHALL BE LIMITED TO EXISTING HARDSCAPE PAVED SURFACES



MCGILVRA ELEMENTARY SCHOOL
WOOD WINDOW & DOOR REPAIRS
1617 38TH AVE E,
SEATTLE, WA 98112

PERMIT SET 6/2/2026

| REVISIONS | |
|-----------|------|
| # | DATE |
| | |

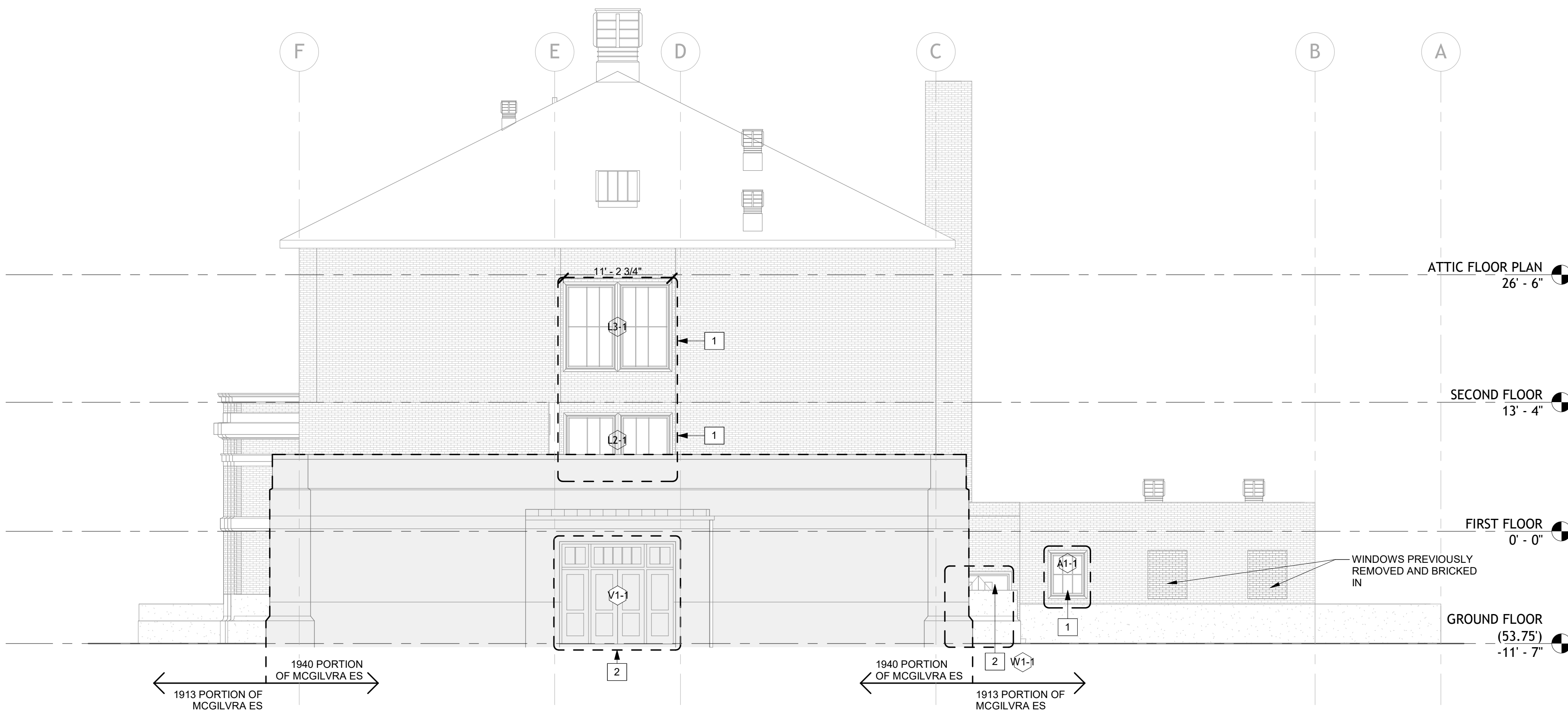
PROJECT ARCHITECT
PROJECT MANAGER
DRAWN
SDL

SITE PLAN

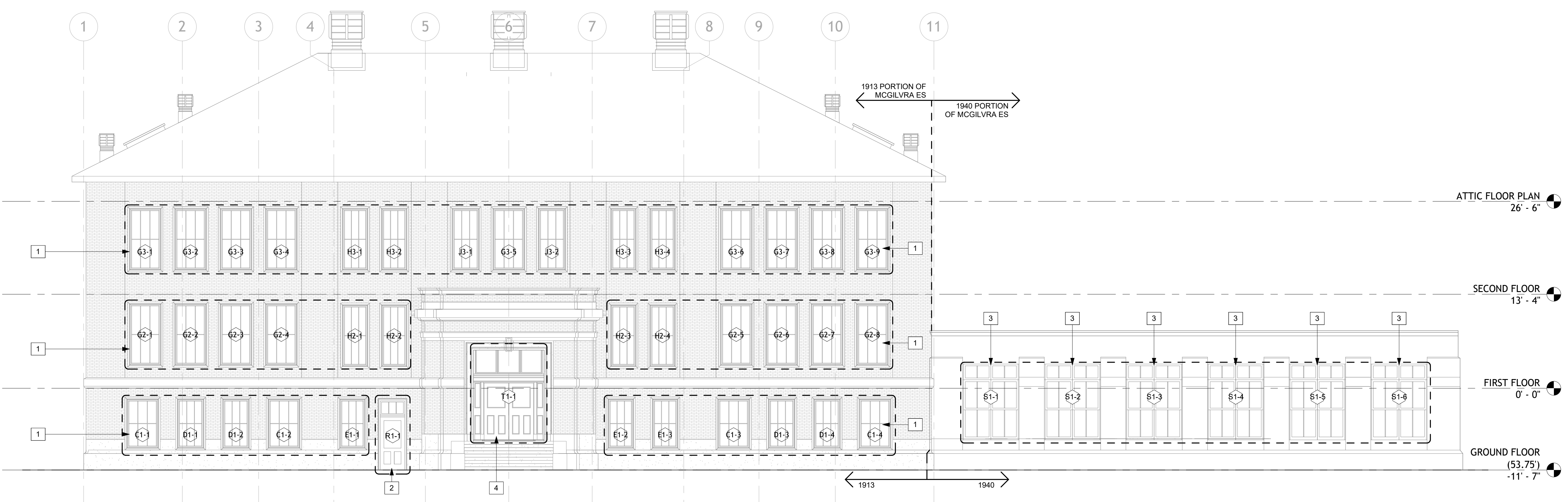
A-0.0
P2216

1 SITE PLAN
1" = 20'-0"





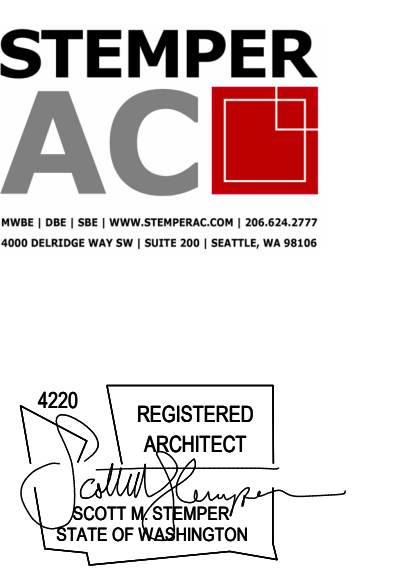
1 NORTH ELEVATION



2 EAS ELEVATION

| ENVELOPE UPGRADES KEYNOTE LEGEND | |
|----------------------------------|--|
| 1 | REFURBISH EXISTING WOOD WINDOWS, EXTERIOR CASINGS, AND WOOD SUBSILLS. REPLACE SINGLE PANE GLAZING WITH VACUUM INSULATED GLAZING UNITS (VIG'S). REPLACE EXISTING WEATHER SEALS. REPLACE EXISTING SEALANTS AT WINDOW PERIMETER. |
| 2 | ALTERNATE-1: REFURBISH EXISTING WOOD DOORS AND FIXED WINDOWS. REPLACE SINGLE PANE GLAZING WITH VACUUM INSULATED GLAZING UNITS (VIG'S). |
| 3 | ALTERNATE-2: REFURBISH EXISTING WOOD WINDOWS, EXTERIOR CASINGS, AND WOOD SUBSILLS. REPLACE SINGLE PANE GLAZING WITH VACUUM INSULATED GLAZING UNITS (VIG'S). REPLACE EXISTING WEATHER SEALS. REPLACE EXISTING SEALANTS AT WINDOW PERIMETER. |
| 4 | ALTERNATE-3: REFURBISH EXISTING WOOD DOORS AND FIXED WINDOWS. REPLACE SINGLE PANE GLAZING WITH VACUUM INSULATED GLAZING UNITS (VIG'S). |

| ELEVATION GRAPHIC LEGEND | |
|--------------------------|----------------|
| # | KEYNOTE |
| U-1 | WINDOW TYPE |
| U-1 | WINDOW NUMBER |
| | FLOOR LOCATION |



MCGILVRA ELEMENTARY SCHOOL
 WOOD WINDOW & DOOR REPAIRS
 1617 38TH AVE E,
 SEATTLE, WA 98112

PERMIT SET 6/2/2026

| REVISIONS | |
|-----------|------|
| # | DATE |
| | |

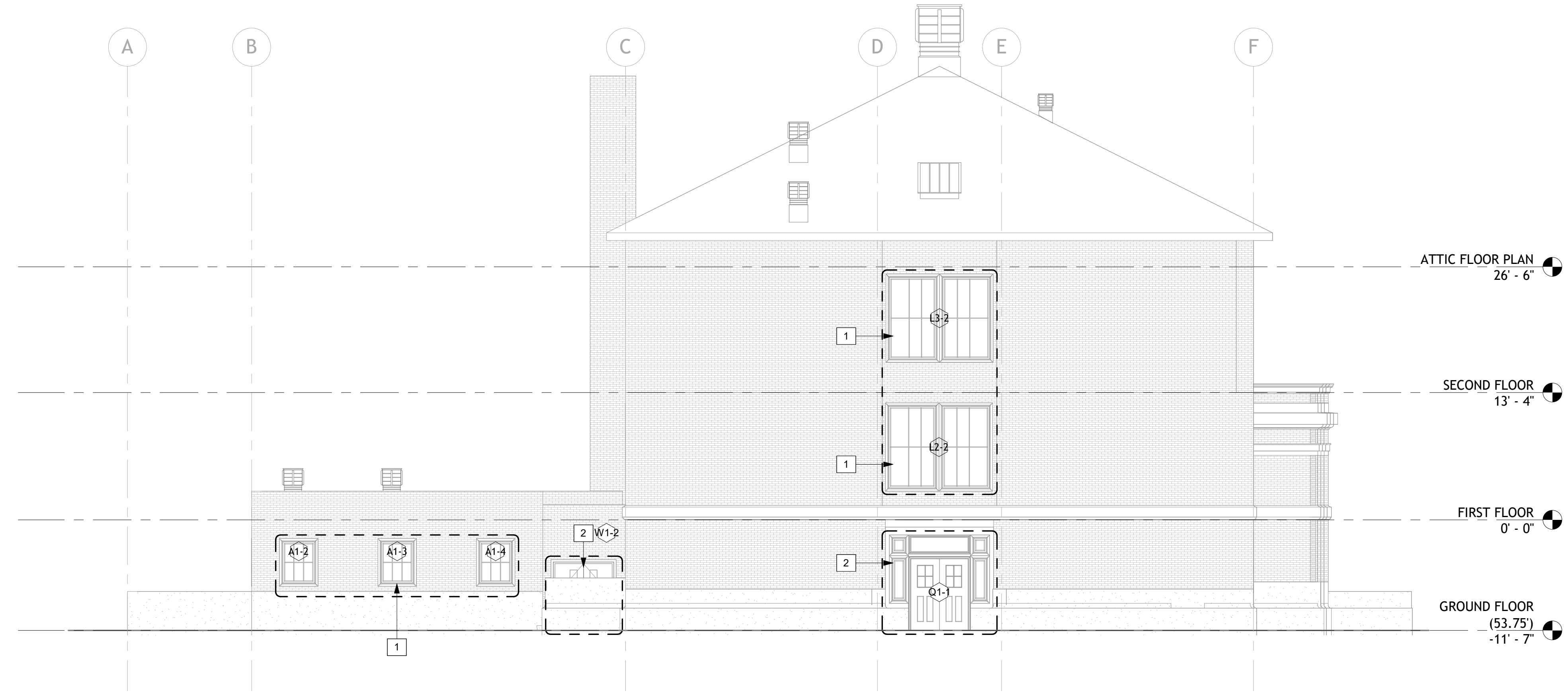
PROJECT ARCHITECT
 PROJECT MANAGER
 DRAWN MAT

ELEVATIONS

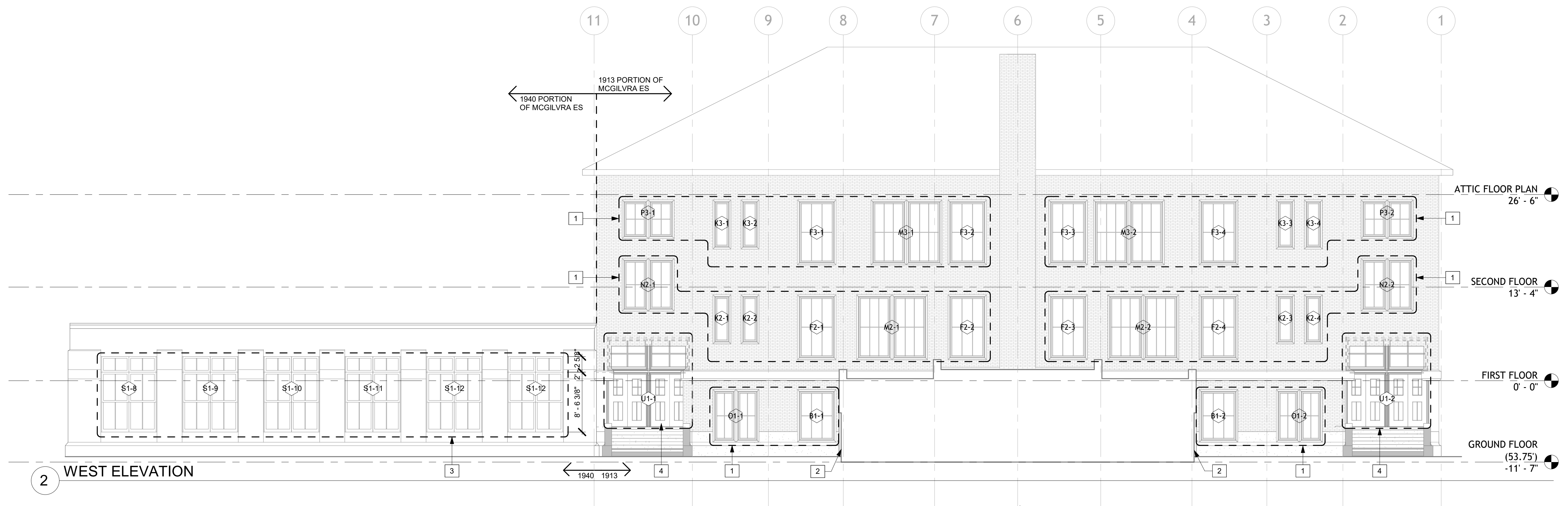
A-2.0
 P2216

| ENVELOPE UPGRADES KEYNOTE LEGEND | |
|----------------------------------|--|
| 1 | REFURBISH EXISTING WOOD WINDOWS, EXTERIOR CASINGS, AND WOOD SUBSILLS. REPLACE SINGLE PANE GLAZING WITH VACUUM INSULATED GLAZING UNITS (VIG'S). REPLACE EXISTING WEATHER SEALS. REPLACE EXISTING SEALANTS AT WINDOW PERIMETER. |
| 2 | ALTERNATE-1: REFURBISH EXISTING WOOD DOORS AND FIXED WINDOWS. REPLACE SINGLE PANE GLAZING WITH VACUUM INSULATED GLAZING UNITS (VIG'S). |
| 3 | ALTERNATE-2: REFURBISH EXISTING WOOD WINDOWS, EXTERIOR CASINGS, AND WOOD SUBSILLS. REPLACE SINGLE PANE GLAZING WITH VACUUM INSULATED GLAZING UNITS (VIG'S). REPLACE EXISTING WEATHER SEALS. REPLACE EXISTING SEALANTS AT WINDOW PERIMETER. |
| 4 | ALTERNATE-3: REFURBISH EXISTING WOOD DOORS AND FIXED WINDOWS. REPLACE SINGLE PANE GLAZING WITH VACUUM INSULATED GLAZING UNITS (VIG'S). |

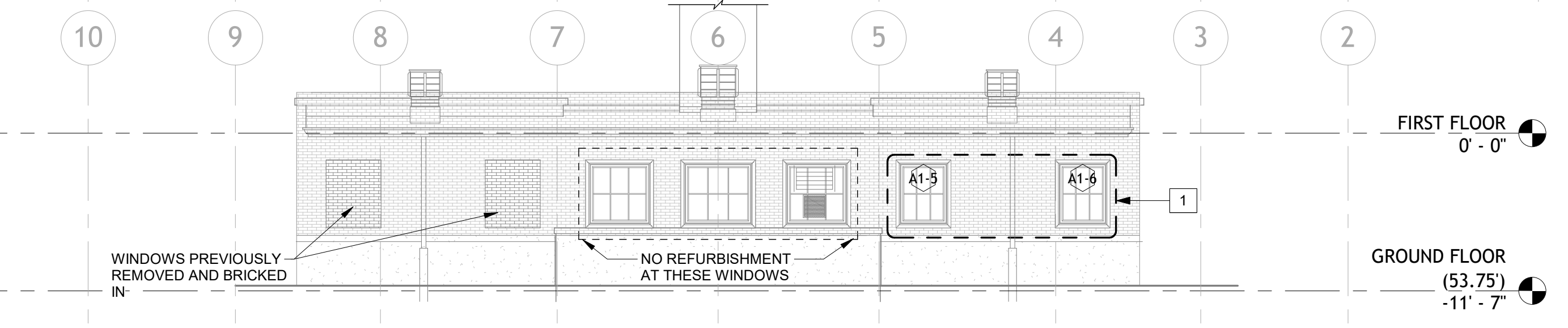
| ELEVATION GRAPHIC LEGEND | |
|--------------------------|----------------|
| # | KEYNOTE |
| U1-1 | WINDOW TYPE |
| U1-1 | WINDOW NUMBER |
| U1-1 | FLOOR LOCATION |



1 SOUTH ELEVATION

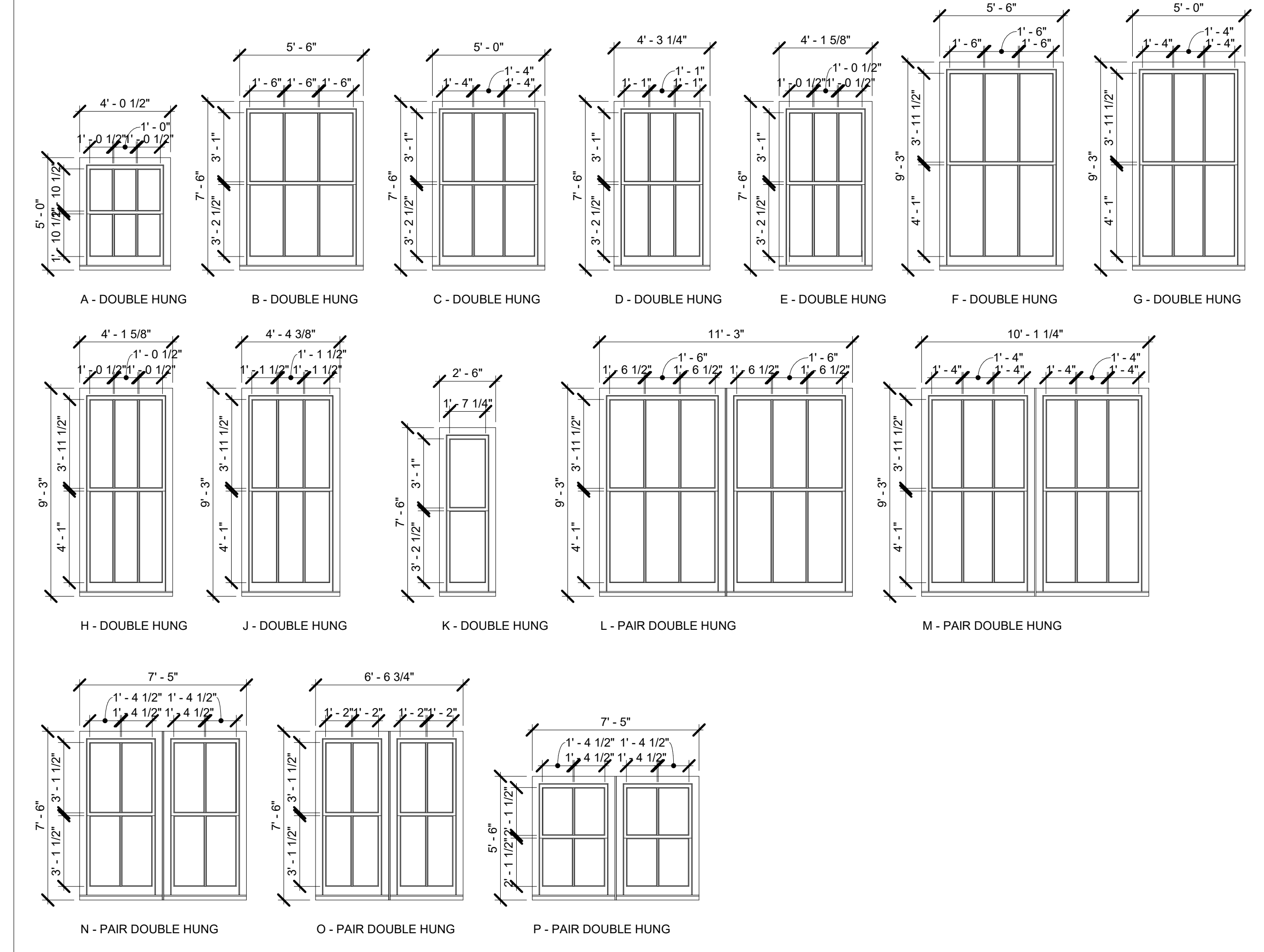


2 WEST ELEVATION

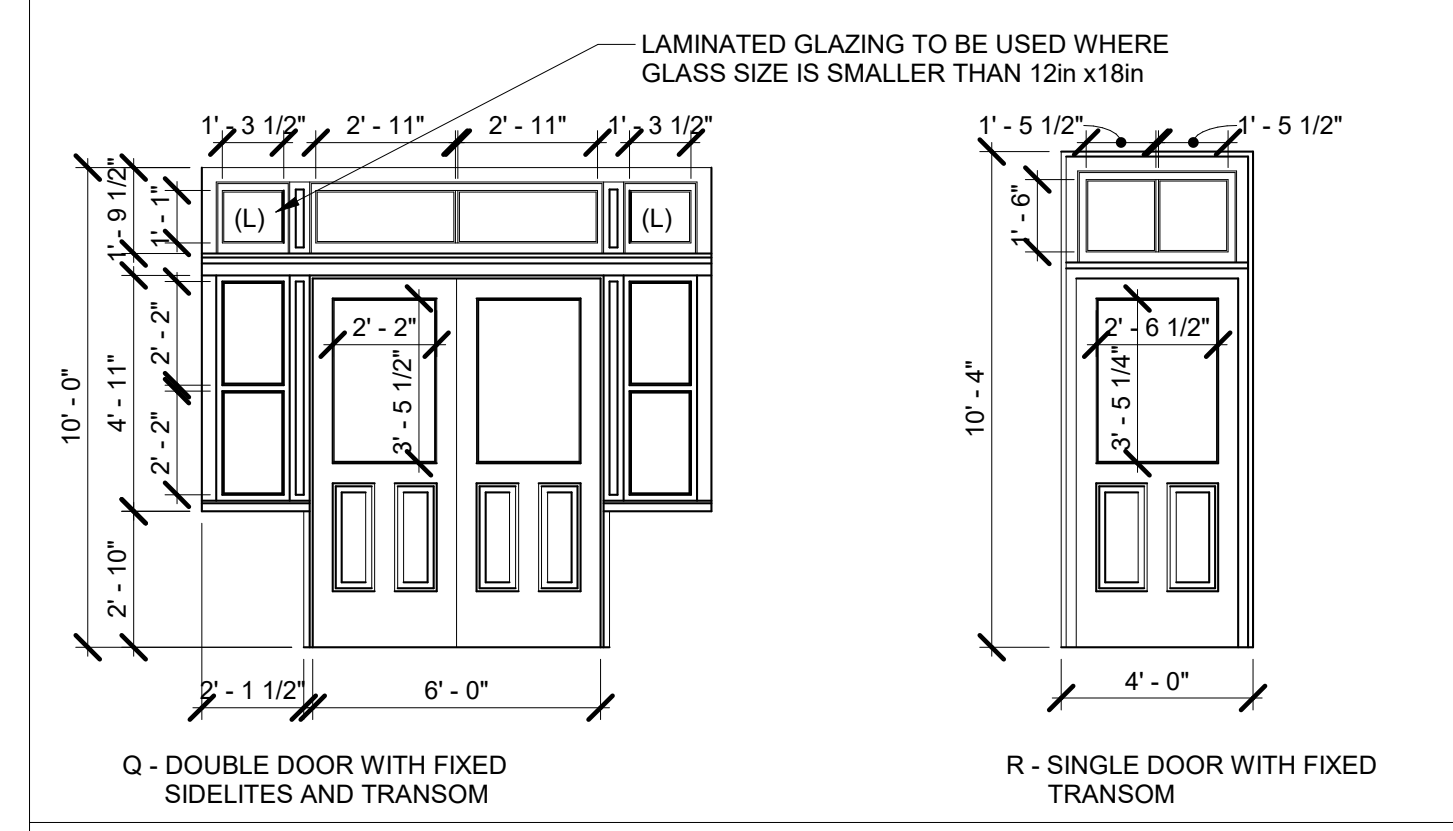


3 WEST ELEV

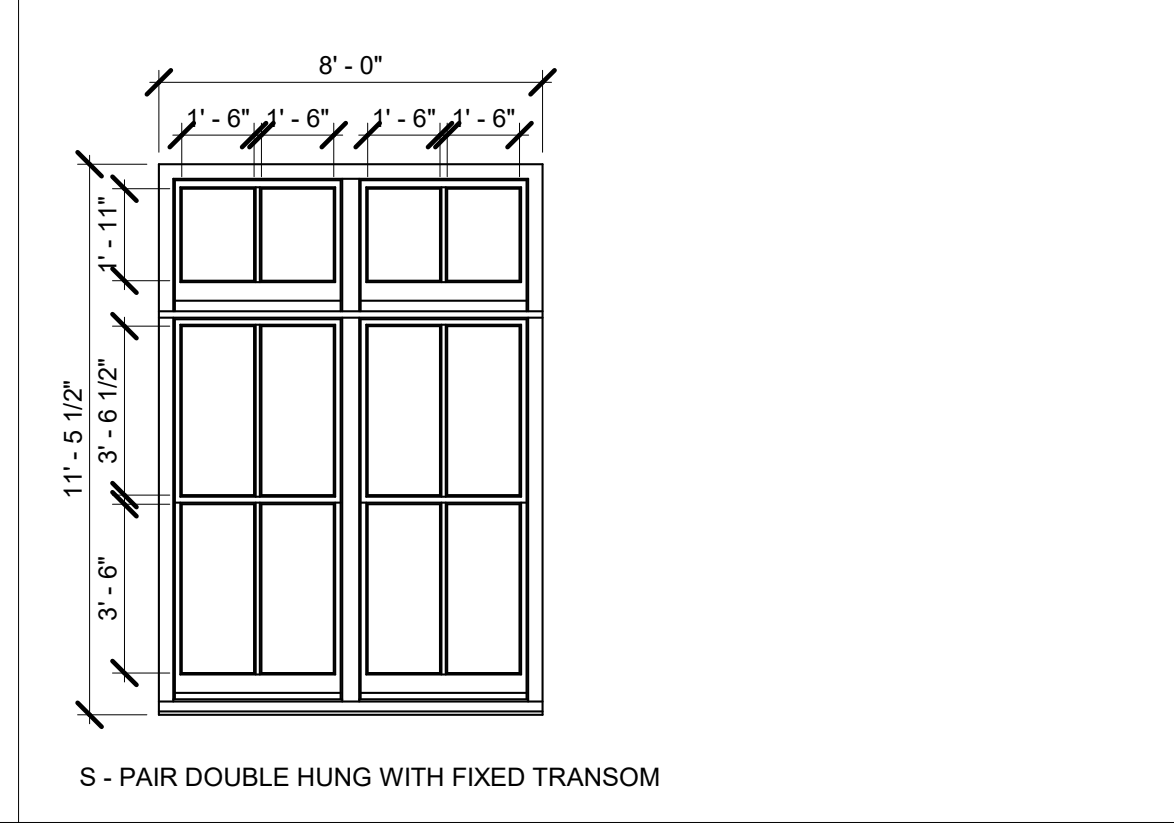
BASE BID: 1913 WOOD WINDOWS



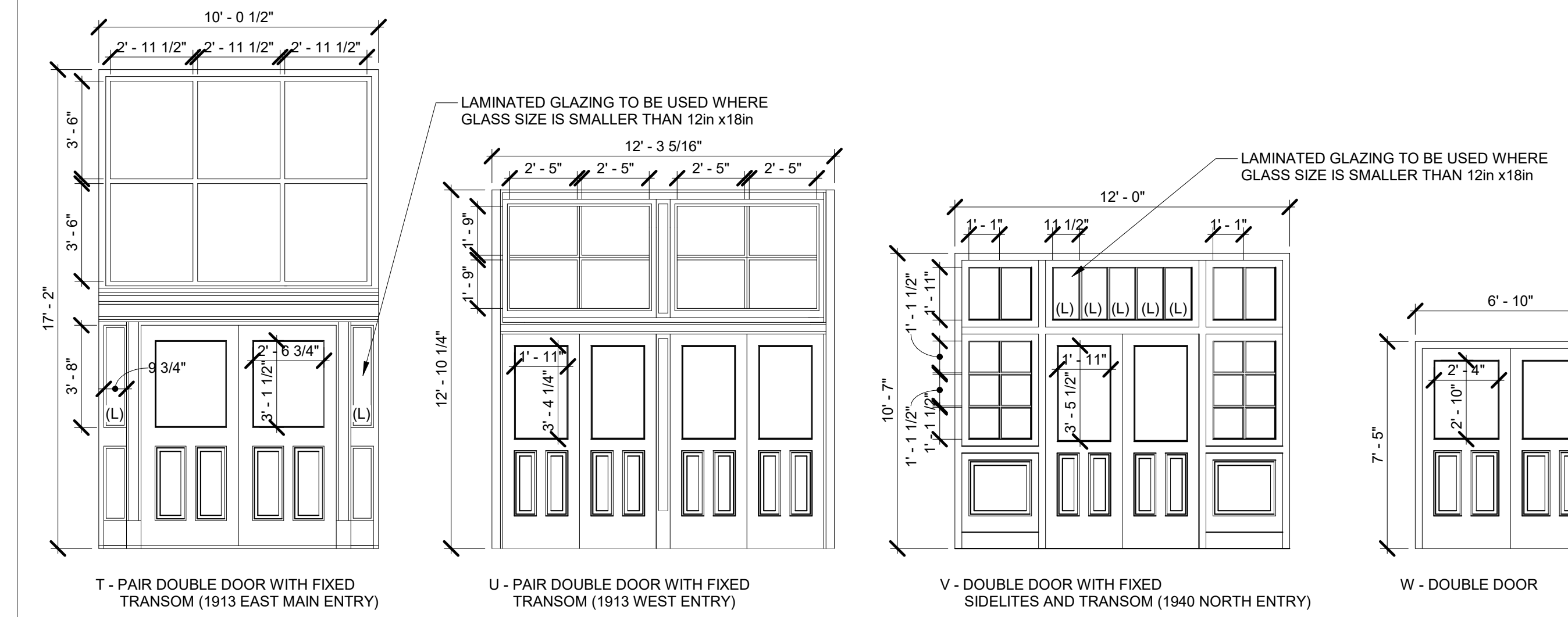
ALTERNATE-1: 1913 GROUND LEVEL WOOD DOORS AND WINDOWS



ALTERNATE-2: 1940 WOOD WINDOWS

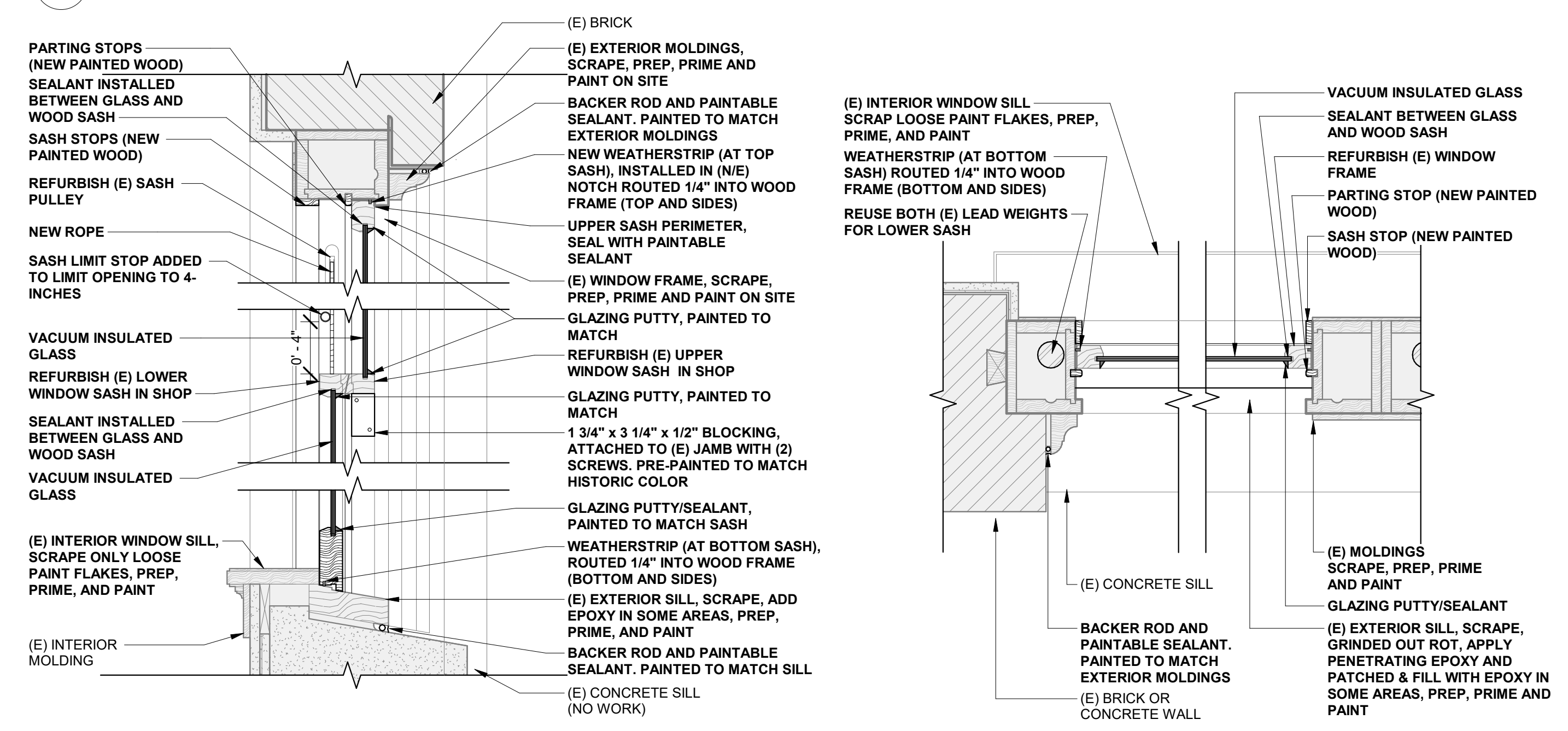


ALTERNATE-3: REMAINING 1913 & 1940 WOOD DOORS AND WINDOWS

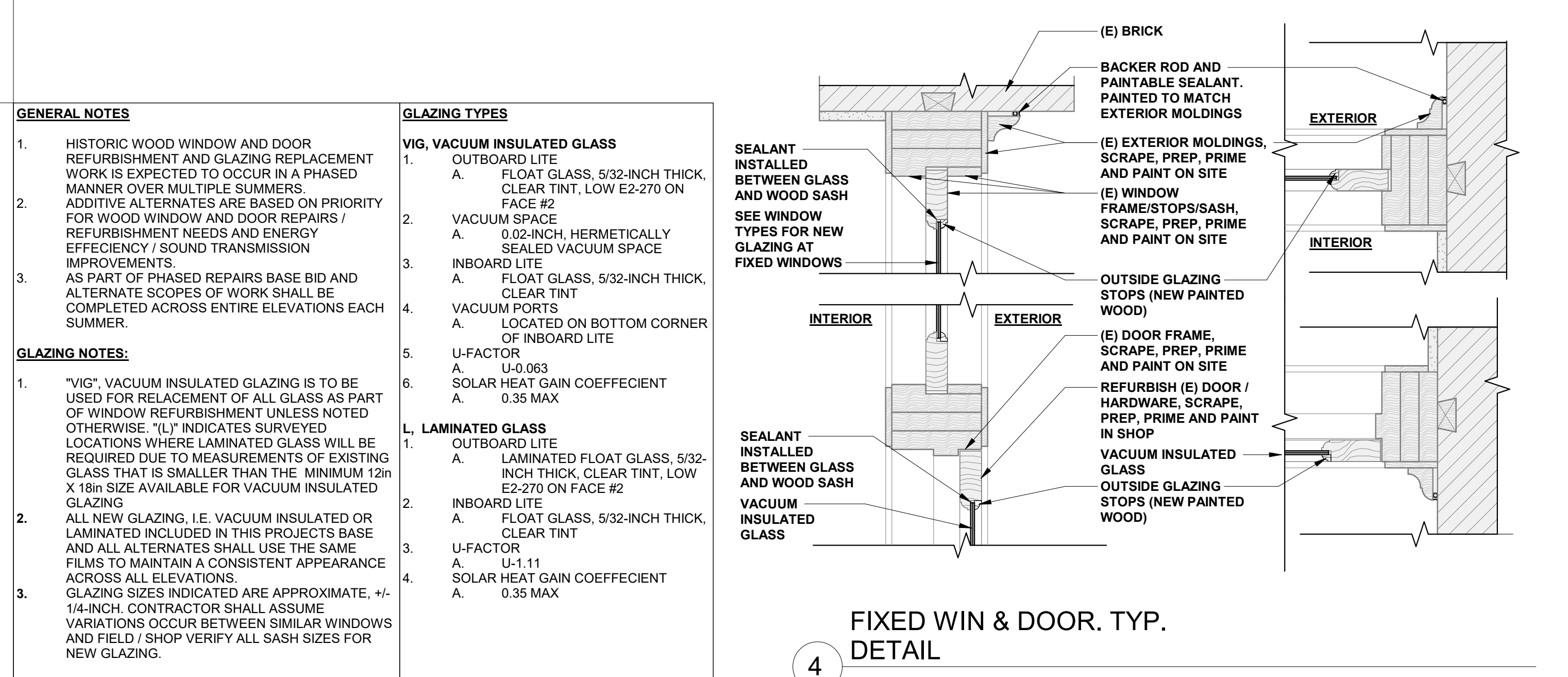


1 WINDOW TYPES

2 1913 WIN. TYP. DETAILS



3 1940 WIN. TYP. DETAILS



4 FIXED WIN & DOOR. TYP. DETAIL

GENERAL NOTES

- HISTORIC WOOD WINDOW AND DOOR REFURBISHMENT AND GLAZING REPLACEMENT WORK IS EXPECTED TO OCCUR IN A PHASED MANNER OVER MULTIPLE SUMMERS. ADDITIVE ALTERNATES ARE BASED ON PRIORITY FOR WOOD WINDOW AND DOOR REPAIRS / REFURBISHMENT NEEDS AND ENERGY EFFICIENCY / SOUND TRANSMISSION IMPROVEMENTS.
- AS PART OF PHASED REPAIRS BASE BID AND ALTERNATE SCOPES OF WORK SHALL BE COMPLETED ACROSS ENTIRE ELEVATIONS EACH SUMMER.

GLAZING NOTES:

- "VIG": VACUUM INSULATED GLAZING IS TO BE USED FOR REPLACEMENT OF ALL GLASS AS PART OF WINDOW REFURBISHMENT UNLESS NOTED OTHERWISE. "(L)" INDICATES SURVEYED LOCATIONS WHERE LAMINATED GLASS WILL BE REQUIRED DUE TO MEASUREMENTS OF EXISTING GLASS THAT IS SMALLER THAN THE MINIMUM 12in X 18in SIZE AVAILABLE FOR VACUUM INSULATED GLAZING
- ALL NEW GLAZING, I.E. VACUUM INSULATED OR LAMINATED INCLUDED IN THIS PROJECTS BASE AND ALL ALTERNATES SHALL USE THE SAME FILMS TO MAINTAIN A CONSISTENT APPEARANCE ACROSS ALL ELEVATIONS.
- GLAZING SIZES INDICATED ARE APPROXIMATE, +/- 1/4-INCH; CONTRACTOR SHALL ASSUME VARIATIONS OCCUR BETWEEN SIMILAR WINDOWS AND FIELD / SHOP VERIFY ALL SASH SIZES FOR NEW GLAZING.

GLAZING TYPES

VIG, VACUUM INSULATED GLASS

- OUTBOARD LITE
 - FLOAT GLASS, 5/32-INCH THICK, CLEAR TINT, LOW E2-270 ON FACE #2
- VACUUM SPACE
 - 0.02-INCH, HERMETICALLY SEALED VACUUM SPACE
- INBOARD LITE
 - FLOAT GLASS, 5/32-INCH THICK, CLEAR TINT
- VACUUM PORTS
 - LOCATED ON BOTTOM CORNER OF INBOARD LITE
- U-FACTOR
 - U-0.063
- SOLAR HEAT GAIN COEFFICIENT
 - 0.35 MAX

L. LAMINATED GLASS

- OUTBOARD LITE
 - LAMINATED FLOAT GLASS, 5/32-INCH THICK, CLEAR TINT, LOW E2-270 ON FACE #2
- INBOARD LITE
 - FLOAT GLASS, 5/32-INCH THICK, CLEAR TINT
- U-FACTOR
 - U-1.11
- SOLAR HEAT GAIN COEFFICIENT
 - 0.35 MAX



MOCK-UP WINDOW





Reading Comprehension Strategies

- * Rereading
- * Asking questions
- * Make inferences
- * Making predictions
- * Visualizing

Punctuation

Period tells you when it's the end of a sentence
Question Mark end of sentence that asks
Exclamation Point ends a sentence with strong feeling
Comma in dialogue, in between sentences with a conjunction, listing > 2 things
Quotation Marks marks dialogue & titles
Apostrophe contractions, ownership
Luciano like brainrot Dem also like it.
Does Aries like fishing? What happened Rye?
Fiddlesticks! It's a PlayStomach!
"Okno," she said. Nam likes cookies, but Alton doesn't like the cookies.
Jeno loves sushi, ice cream, tacos, and pizza.
Ownership "will not" work
Rev's had "I am" "I'm"

MOCK-UP WINDOW





PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Project Drawings and general provisions of the Construction Contract, including General and Supplementary Conditions, Division 01 Specification Sections and bidding requirements, apply to the work of this Section.
- B. Technical publications, standards, and reference documents as outlined in individual Technical Specification Sections and as indicated on the Project Drawings.
- C. Current Seattle Building Code, and all other applicable codes and regulations required for the Project.
- D. This Specification shall be read as a whole by all parties concerned. Each Section may contain more or less the complete work of any trade. The Contractor is solely responsible to make clear to the Sub-contractors the extent of their work and coordinate overlapping work.

1.02 SUMMARY

- A. Provide all the Wood Window Restoration Work required to carefully complete the work of the contract including all the Wood Window Restoration Work shown on the plans, listed in this Specification, and needed to install a complete assembly, with all reinforcing, pinning, and finishes. Coordinate the Wood Window Restoration Work with all the other trades for the project. Provide all demolition and disposal Work to complete the Wood Window Restoration Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. It is the General Contractor's responsibility to review all the Work of each section, and each Subcontractor, for the entire project so that all the Work can be properly and completely performed.
- B. Wood Window Restoration Work includes, but is not limited to providing all labor, materials, equipment, and services necessary to complete the restoration of the wood windows, as specified herein.
 - 1. Carefully remove existing wood stops and parting beads and disconnect ropes from existing double hung window sashes to allow for temporary removal and refurbishment of wood window off-site in a shop environment.
 - a. Bidders shall assume that all existing interior wood stops, wood parting beads between double hung sashes will require replacement, i.e. they will be either too deteriorated or damaged during removal for successful refurbishment.
 - 2. Restoration of historic windows at McGilvra Elementary will consist of careful preparation and performance of selective paint removal, consolidation and filling of deteriorated areas with specified epoxy material, tightening of joints, priming, painting, reglazing, installation of new weather-stripping, restoration of original hardware, limited installation of new hardware, installation of mechanically

attached blocking to make upper window sashes inoperable, and sealing of upper window sashes with perimeter sealant joints. Specific expectation for wood window refurbishment includes the following:

- a. Wood Sashes: After careful removal of existing wood sashes and delivery to a shop environment; carefully remove existing glass and glazing putty, strip all existing loose or unsound paint coatings from wood window sashes, and prepare/refurbish, prime, and paint wood window all window sash components including muntins.
 - i. Remove all glazing putty and single pane glass from window sashes.
 - ii. Remove existing loose or otherwise unsound paint from historic window sashes in a shop environment off-site. Although the Windows at McGilvra Elementary school were previously refurbished the presence of residual/original lead paint should be expected beneath visible paint coatings. See Specification Sections 02 83 00 Lead-Related Activities.
 - ii. Repair deteriorated wood elements using epoxy consolidation, epoxy consolidation and patching as appropriate to each individual member to ensure that sound existing material is saved and that at completion of work, all wood elements are free of rotted and deteriorated wood and solid and true to original profiles with all arises sharp and true. Note: Based on a condition's assessment, dutchman repairs, and/or member replacement is not anticipated for refurbishment of wood window sashes as part of this project.
 - iii. Prime, and paint coatings shall be applied to all surfaces including edges and surfaces concealed by glazing putty or sealant.
 - iii. Primer and each finish paint coating layer shall be a distinct color or discernably different enough color shade to allow for visible inspection to ensure paint coatings are fully applied.
 - iv. Paint coatings must be fully dry before window sashes are reglazed and final finish coatings must be fully dry before window sashes are shipped back to the school for reinstallation.
 - v. All upper double hung window sashes windows will be rendered inoperable via painted wood blocking installed on the interior side of the window frame, and used to secure the window sash to the window frame via mechanical fastening.
- b. Hardware: Salvage, retain and reinstall historic hardware; Replace any missing or unsound hardware including fasteners to match the original historic material and to the greatest extent possible, the original historic appearance and operation. Historic hardware repair is limited to the

temporary removal of the hardware to facilitate removal of unsound existing paint coatings, wood refurbishment, and reinstallation in the hardware's original historic location.

- i. Removal of lead paint from historic window hardware is not anticipated due to recent window refurbishment.
 - ii. Salvaged or repaired window hardware is to be reinstalled onto refurbished wood window components after paint coatings are fully dry.
 - iii. Bidders shall include a cost for the replacement of all lower sash ropes, five (5) pull handles, five (5) lower sash locks, and five (5) lower sash rope weight pulleys.
 - iv. Bidders shall assume that all existing sash weights will be salvaged for reuse but that additional sash weights will be required due to the increased weight of the vacuum insulated glazing installed as part of this project.
 - v. Install new painted wood stops to fix upper sashes in the closed position. Mechanically fasten stops to the window frames and conceal fastener heads with matching touch-up paint coatings.
 - vi. Install new black rubber stops to limit the opening operation of lower sashes to 4-inches.
- b. Wood Frames: Carefully remove all existing stops and parting beads for replacement and to facilitate removal and off-site refurbishment of wood sashes. Inspect frame condition and strip existing paint coatings as required to repair and replace wood elements as required to provide refurbished and sound frames with all members having original planes and profiles prepped and painted on-site.
- i. Protect frame and opening from weather. Dry all wood to moisture content below 15 percent.
 - ii. Strip paint from exterior frame members and sills. Use care to avoid damage to existing wood and adjacent building finishes. Although the Windows at McGilvra Elementary school were previously refurbished the presence of residual/original lead paint should be expected beneath visible paint coatings. See Specification Sections 02 83 00 Lead-Related Activities.
 - iii. Carefully remove extraneous nails, staples, bolts, hooks, etc., from window frame.
 - iv. Carefully remove dirt and debris from frame, including loose dirt inside window frames and weight pockets accessible from jamb access panels.
 - v. Repair wood frame elements using epoxy consolidation, epoxy consolidation and patching, Dutchman repairs, and/or member replacement as appropriate to each individual member to ensure that sound existing material is saved and that at completion of

work, all wood elements are free of rotted and deteriorated wood and solid and true to original profiles with all arises sharp and true.

- vi. Replace all wood stops and parting beads with new wood members matching original historic profiles.
 - vii. Prime, and paint coatings shall be applied to all exposed surfaces of window frames that are not dismantled and all surfaces of wood components that are replaced, such as stops and parting beads, including edges and surfaces concealed after reinstallation of wood sashes, installation of sealants or weather stripping.
 - viii. Primer and each finish paint coating layer shall be a distinct color or discernably different enough color shade to allow for visible inspection to ensure paint coatings are fully applied.
 - ix. Paint coatings must be fully dry before new wood stops, parting beads, refurbished wood sashes, hardware, sealants, and weather stripping are installed.
- c. Weather-stripping: Carefully remove existing bronze/metal weather-stripping from window sashes and frames to facilitate wood refurbishment, paint repairs and installation of new weather-stripping.
- i. Carefully rout the sides and bottom of existing lower wood window sashes and the sides and top of upper window sashes to facilitate the installation of new kerf mounted weather-stripping. Utilize existing kerf notches where found.
 - ii. Install exterior paintable sealants around the perimeter of fixed upper wood window sashes. Install touch-up paint coatings to all exposed paintable sealants.
- d. Exterior Wood Casings: Inspect casings condition and strip existing paint coatings as required to repair and replace wood elements as required to provide refurbished and sound exterior casings with all members having original planes and profiles prepped and painted on-site
- i. Strip paint from exterior casing members. Use care to avoid damage to existing wood and adjacent building finishes. See Specification Sections 02 83 00 Lead-Related Activities.'
 - ii. Repair wood casing elements using epoxy consolidation, epoxy consolidation and patching, as appropriate to each individual member to ensure that sound existing material is saved and that at completion of work, all wood elements are free of rotted and deteriorated wood and solid and true to original profiles with all arises sharp and true.
 - iii. Prime, and paint coatings shall be applied to all exposed surfaces of window casings that are not dismantled and surfaces of wood components that are repaired.

- iv. Primer and each finish paint coating layer shall be a distinct color or discernably different enough color shade to allow for visible inspection to ensure paint coatings are fully applied.

1.03 RELATED SECTIONS

- A. Section 01 11 10 – Summary of Hazardous Materials Work

Good Faith Inspection Letter – 2026 Seismic and Exterior Improvements Projects at McGilvra Elementary School.
- B. Section 02 41 19 – Selective Demolition
- C. Section 02 83 00 – Lead-Related Activities
- D. Section 07 92 00 – Joint Sealants
- E. Section 09 90 00 – Paints and Coatings

1.04 QUALITY ASSURANCE

- A. References
 - 1. AWI Quality Standard: Comply with applicable requirements in AWI’s “Architectural Woodwork Quality Standards” for construction, finishes, grades of wood windows, and other requirements.
 - 2. NPS Preservation Brief #9; The Repair of Historic Wood Windows, 1981.
 - 3. ASTM E2112-19c, Standard Practice for Installation of Exterior Windows, Doors and Skylights.
 - 4. NPS Preservation Brief #10 – Exterior Paint Problems on Historic Woodwork.
 - 5. NPS Preservation Technical Notes:
 - a. #4 – Replacement Wooden Frames and Sashes.
 - b. #6 – Replacement Wooden Sash and Frames with Insulated Glass and Integral Muntins.
 - c. #14 – Reinforcing Deteriorated Wooden Windows.
 - d. #16 – Repairing and Upgrading Multi-Light Wooden Mill Windows.
- B. Restoration Specialist: Work of this Section must be performed by a firm having not less than five (5) years successful experience in comparable window restoration work including successful work on at least three (3) buildings listed in the National Register of Historic Places under the direction of Federal and State preservation agencies in the processes and operations indicated.

1. Only skilled workers who are familiar and experienced with wood window work of historic buildings shall be employed.
 2. In acceptance or rejection of restoration work, no allowance will be made for lack of skill on the part of workers.
 3. For historic features that are being restored offsite, the City of Seattle Landmarks Board Coordinator will require documentation from the restoration contractor including a description of the work, where it will occur, confirmation that it is a licensed and bonded facility, and documentation of the insured replacement value so that any lost or damaged historic materials can be recreated in-kind.
- C. Maintain a steady work crew consisting of qualified craftspeople and a full-time foreman who has a minimum of 5-years' experience in wood window restoration. Confirm that all workers fully understand the requirements of the job. Allow for inspection of all work areas by the Owner's Project Manager and Project Architect.
- D. "Skilled Craftsperson" is defined as an artisan trained in the conservation, reproduction and restoration of wood windows. The craftsperson must have experience in restoration of wood windows.
1. Foreperson: Wood window restoration shall be directly supervised by a full-time foreperson. Same foreperson shall remain on Project throughout work unless his performance is deemed unacceptable.
 2. Mechanics: Wood window restoration shall be carried out by a steady crew of skilled mechanics who are thoroughly experienced with materials and methods specified and have a minimum of three years' experience with work on historic buildings similar to that required by this Section. In acceptance or rejection of work of this Section, no allowance will be made for workers' incompetence or lack of skill.
- E. Standards: Work of this Section shall comply with requirements and recommendations of the following standards, with requirements of this Section, and with applicable laws, codes, and regulations. In each case in which there is a conflict between the requirements, the most stringent and restrictive requirement shall govern.
1. Reference standards for restoration work to be established by quality control panels which have been approved by the Project Architect or Project Manager and which shall serve as standards during the entire restoration process.
 2. All materials shall conform to the latest edition of reference specifications applicable and specified herein and to applicable codes and requirements of local authorities having jurisdiction.
- F. No Modifications to the Specification, Project Drawings, or substitutions of specified products shall be made without direct approval of the Architect and Owner's Project Manager. The Contractor shall provide a written request for review and potential approval by the Architect.

1.05 **QUALITY CONTROL**

- A. Contractor shall provide documentation that the Sub-contractor/Installer meets the experience and training requirements for the specified materials and system. Contractor shall maintain on-site supervision continuously to assure on-going quality control during the installation.
- B. The Contractor shall notify the Architect, and the Owner's Project Manager at least fourteen (14) days prior to commencement of the work.
- C. Manufacturer's Technical Services Representative shall be available for technical information and project-site meetings, and be thoroughly experienced with the products to be installed, installation requirements, and practices, quality control of the installation, and with published special consideration in the geographical area and climate where construction will take place.
- D. The General Contractor and Sub-contractors shall be responsible for complete, watertight, and weatherproof building envelope systems and assemblies. The Contractor shall establish and follow best practices for the trade and provide quality-control and quality assurance for the successful completion of the buildings envelope systems.
- E. Observation and Testing:
 - 1. The Owner reserves the rights to have an Envelope Consultant perform observation or monitoring of the installation.
 - 2. Such observation shall not relieve the Contractor of responsibility for proper execution and thorough completion of the Work.
 - 3. Any testing that may be deemed necessary will be performed to determine compliance with the Contract Documents.
- F. Pre-construction Meeting to include Owner's Project Manager, Project Architect, Envelope Consultant and Envelope Monitor, Contractor, Superintendent, and designated lead foreperson (lead installer), and sub-contractors/installers whose work interfaces with, or affects, the installation of the specified system. Review well-secured tenting and temporary protection requirements.

1.06 **ACTION SUBMITTALS**

- A. General: Submit each Item in this Specification Section. Revise and resubmit each item as required to obtain approval of Project Architect.
- B. Product Data: Manufacturer's technical data for each product to be used in work of this Section. Include test reports and certificates substantiating that products comply with specified requirements, recommendations for application and use, and Material Safety Data Sheets (MSDS).
- C. Wood Treatment Data; Chemical treatment manufacturer's instructions for handling, storage, installation, and finishing treated materials if applicable.

- D. Schedule: A schedule of work showing all windows and including interior finishes, window types, locations, dimensions, and types of repair or replacement of each window assembly.
- E. Samples
 - 1. Wood for Repair and Replacement: Minimum 12-Inch x 1-Inch samples of each type to be used.
 - 2. Wood Member Profiles: 12-Inch-long pieces of each profile required for repair, replacement, or alteration.
 - 3. Weather-stripping: 12-inch-long samples of each type.
 - 4. New Hardware: Each type required for replacement of missing or unserviceable hardware.
- E. Quality Control Panels: Perform quality control panels as specified in Article "Quality Controls Panels" below.

1.07 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data:
 - 1. Provide a written maintenance schedule for the owner's future maintenance requirements.
 - 2. Perform instruction for owner's maintenance personnel with regard to rope replacement, hardware operation, and finish touch-up if requested.
 - 3. Provide details of restoration steps undertaken for owner's records.

1.08 QUALITY CONTROL PANELS

- A. General: Before beginning general wood window restoration, prepare quality control panels to provide standards for work of this Section. Do not proceed with wood window restoration until the Owner's Project Manager has approved quality control panels.
 - 1. Locate quality control panels as directed by the Owner's Project Manager.
 - 2. Notify the Owner's Project Manager and Project Architect 48 hours prior to start of each quality control panel.
 - 3. Owner's Project Architect will monitor quality control panels.
 - 4. Use crew that will execute the work and follow requirements of this Section.

5. Repeat quality control panels as necessary to obtain Owner's Project Manager and Project Architects approval.
 6. Protect approved quality control panels to ensure that they are without damage, deterioration, or alteration at time of Substantial Completion.
 7. Approved quality control panels in undamaged condition at time of Substantial Completion maybe incorporated into the Work.
 8. Approved quality control panels will represent minimum standards for wood window restoration. Subsequent wood window restoration work that does not meet standards of approved quality control panels will be rejected.
- B. Prepare the following Quality Control Panels
1. Refurbished Exterior Casings: One (1) completed location, demonstrating horizontal and vertical refurbishment of wood casings, including preparation and paint coatings.
 2. Refurbished Window: One (1) complete unit, refurbished upper fixed and lower operable sash, including new wood components, preparation and paint coatings; installation in the window sash to frame; replacement of glass stops, all lights replaced with vacuum insulated glazing, new weather-stripping, refurbished and or reinstalled hardware.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. General: Deliver, store, and handle all materials to protect them from damage, moisture, dirt, and introduction of foreign matter. Store materials on raised platforms and under ventilated, waterproof cover, Store packaged materials in manufacturer's unopened containers, marked with manufacturer's name and product brand name. Immediately reseal containers after, partial use. Remove damaged and deteriorated materials and replace with fresh materials:
- B. Do not deliver or install kiln-dried materials unless spaces in which they will be stored and in which they will be installed are sufficiently dry. Obtain Project Architect or Owner's Project Manager approval before delivering such materials.

1.08 PROJECT CONDITIONS

- A. Safety: Take all necessary precautions to protect all persons, whether engaged in work of this Section or not, from all hazards of any kind associated with the work of this Section.
- B. Protection of Building: Protect building elements and finishes from damage or deterioration caused by work of this Section. Repair any damage to materials or finishes to Project Architect or Owner's Project Manager's satisfaction at no additional cost to Owner.
1. Take all required and necessary precautions to prevent fire and spread of fire.

1.09 ENVIRONMENTAL CONDITIONS

- A. General: Perform work only when temperature of products being used, temperatures of existing and new materials, and air temperature and humidity comply with product manufacturers' requirements and requirements of this Section.
- B. Use of Epoxy Resins: Mix and apply epoxy resins only when temperatures are rising and between 50 degrees Fahrenheit and 80 degrees Fahrenheit or rising and within manufacturer's temperature requirements.
- C. Electronic Moisture Meter Testing: Contractor shall be responsible to ensure wood materials are appropriately dry, prior to installation and prior to coating with epoxy or high-performance coating system. Wood components shall have a maximum allowable moisture level of 15.0% when tested with a calibrated Delmhorst BD-2100 moisture meter using the integral 5/16-inch long pins. Wood with moisture levels higher than 15.0% shall be considered wet, and must be replaced or allowed to thoroughly dry-down prior to installation of overlying materials.
- D. Protection of Window Opening: After removal of the sash, all window penings shall be closed with plywood or acrylic panels fitted o each window and secured by a non-destructive anchoring system. The panel shall be durably weathertight and not permit moisture to enter the building or collect in the existing window sill.

1.10 LEAD-CONTAINING PAINT (LCP)

- A. See Section 02 83 00 – Lead-Related Activities

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

- A. Grade and Quality: Materials shall conform to the requirements of this Section and shall be new, free from defects, and of recent manufacture.
- B. Manufacturer's Instructions: Comply with material manufacturers' instructions for use of products (including surface preparation, mixing, applying, drying, etc.). In case of conflict with the requirements of this Section, the more stringent requirements shall govern.

2.02 WOOD

- A. Grades of all wood materials under this Section shall be as defined by the rules of the recognized association of lumber manufacturers producing materials specified. Materials for millwork shall meet or exceed the requirements for "Premium Grade, Class 1" work as established by "Project Architectural Woodwork Institute's Architectural Woodwork Institute's Standards". Where conflicts occur between these standards and requirements of this Section, the more stringent or restrictive requirement shall govern in each case.
- B. Lumber shall bear grade and trademark of association under whose rules it is produced and a mark of mill identification.

- C. Lumber shall be of sound stock, solid wood without finger joints or other joints within members, thoroughly seasoned, and kiln-dried to a moisture content not exceeding eight (8) percent.
- D. Work that is, to be finished and/or painted shall be free from defects and blemishes on surfaces exposed to view that will show after finish coat of paint is applied.
 - 1. Materials that are in any way defective and not up to specifications for quality and grade, or otherwise not in proper condition, shall be rejected.
- E. Wood for door and window, frame members, end trim and door repairs: Match existing wood species, Class 1 Douglas Fir, minimum 15 rings per inch (RPI).

2.03 **ADHESIVES AND FASTENERS**

- A. Adhesive for Dutchman Repairs, Member Replacement, and New Sash Fabrication: Epoxy resin glue, designed for use with wood. Provide West System as manufactured by;
 - 1. Gougeon Brothers, Inc., 706 Martin Street, Bay City, Michigan 48708,
 - 2. Abatron, Inc. Kenosha, WI (800)445-1754, Advanced Repair Technology, Cherry Valley, NY (607)264-9040,
 - 3. or approved equal.
- B. Wood Consolidation and Patching System: System of epoxy resins and fillers designed for consolidating and patching deteriorated wood as manufactured by;
 - 1. Gougeon Brothers, Inc, 706 Martin Street, Bay City, Michigan 48706,
 - 2. Abatron, Inc. Kenosha, WI (800)445-1754, Advanced Repair Technology, Cherry Valley, NY (607)264-9040,
 - 3. or approved equal.
- C. Screws for Attaching Hardware: Provide new solid brass screws finished to match hardware finish. All other concealed or painted screws shall be stainless steel.

2.04 **HARDWARE**

- A. General: Provide each restored window with full complement of hardware and fasteners matching that on original windows, except where hardware is specifically indicated to be modified. Provide salvaged, restored existing hardware insofar as possible and new hardware to match existing hardware where hardware is missing or existing hardware is damaged or deteriorated so as to be unsalvageable. Provide new hardware and fasteners to match existing hardware and fasteners in all respects.
- B. Restored Existing Hardware: Restore all existing hardware to be reused following requirements of Article 3.11 "Restoration of Existing Historic Hardware," below.

- C. Sash Lift Handles: Where existing interior handles are missing or unserviceable, provide new cast brass, pull type sash lift handles to match existing.
- D. Sash Locks: Where existing sash locks are missing or unserviceable, provide new sash locks to match existing in material, configuration, and finish.
- E. Sash Pulleys: Where cleaning, lubricating and reuse of existing sash pulleys in not possible, i.e. will prevent window operation, provide new sash pulleys to match existing in material, configuration, and finish.
- F. Sash Cord: Replace all sash cords with minimum breaking strain capacity of 350 kg.
- G. Sash Weights: Ensure that sash weights allow full operation of lower sash and allow sash to be balanced at any position in which it is placed. Add weights to existing sash weights or replace existing sash weights with new heavier weights to accommodate the increased weight of new glazing.
- C. Weather-stripping:
 - 1. Provide weather-stripping at locations indicated on the Project Drawings and listed below
 - a. Sash Perimeter as Indicated: Heavy duty, vinyl or EPDM kerf insert style, white color.

2.05 **GLAZING SEALANTS**

- A. Primer: Provide primer to ensure adhesion to surfaces unless specifically recommended otherwise by sealant manufacturer.
- B. Color: For all exposed locations, provide either paintable sealants or custom colored sealants in the same finish color for wood windows approved by the Landmarks Preservation Board.
- C. Glazing Accessories: Provide setting blocks, edge blocks, glazing tapes, spacer tapes, and other accessories.

2.06 **GLASS**

- A. See Specification Section 08 80 00 Glazing

2.07 **INTERIOR AIR BARRIER SEALANTS**

- A. Reference Specification Section 07 92 00 "Joint Sealant"

2.08 **PAINTING COATINGS**

- A. All restored sash shall be shop painted by the General Contractor as per the requirements of Section 09 90 00.

PART 3 - EXECUTION

3.01 SAFETY

- A. Protection: Protect people, adjoining building surfaces, collections and landscape elements, et al from injury resulting from window restoration work. Use drop cloths or other coverings as necessary to protect interior finishes, floor and collections and exterior landscape material from dust and debris, etc.
 - 1. Erect temporary protection over pedestrian walkways and at those points of entry and exit that must remain operational during restoration.

3.02 INSPECTION AND DOCUMENTATION

- A. Prior to commencement of the work, inspect areas in which work will be performed with the Owner's Project Manager. Photograph existing conditions to structure surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from the work of this Section; file with Owner's Representative and Project Architect prior to starting work.
- B. Examine the areas and conditions where window restoration is to be executed. Take all necessary field measurements.
- C. General: Document all elements of windows to be restored for work of this Section, all elements adjacent to elements that are to be removed, and all other window elements that will be in any way affected by work of this Section. Show overall window elements and details of all damage or deterioration that might be considered as resulting from the work of this Section. Key all notes to photographs, clearly identifying portions of existing elements included in each photograph.
- D. Contractor shall review and inspect each window frame and sash prior to beginning work, to identify any and all visible locations of wood rot, degradation, or damage requiring repair.

3.03 WOOD SASH REMOVAL AND PROTECTION

- A. Remove window sashes for off-site restoration and alteration.
- B. Temporary Protection: Provide temporary closures for window openings.
 - 1. Size temporary panels to exact dimensions of openings and securely fasten to the building to prevent unauthorized entry and sealed weatherproof and watertight.

3.04 REMOVALS

- A. General: Carefully remove all window components that require removal for restoration or for proper installation.

1. To minimize breakage or damage to the frame, paint lines at the edges of window stops and parting beads must be cut/scribed first with a sharp knife before stops or parting beads are removed.
 2. Identify and label each component that is to be removed and repaired or replaced for reinstallation with window opening designator and location. Record numbers and locations of components.
 3. Use all care necessary to prevent damage or deterioration of elements removed and elements remaining in place. Inform Architect, Owner's Representative, and Building Envelope Consultant of damage resulting from component removal, and of all concealed deficiencies observed when components have been removed. Restore or replace all elements damaged during the work of this Section at no additional cost.
 4. Store removed elements in a secure location safe from theft, damage, and deterioration.
 5. Protect window openings to prevent water entry or human intrusion. Window opening protection shall prevent water from collecting on or in rough opening/frame sill.
- B. Glass Removal: All glass will be removed to accommodate sash restoration and glazing replacement work.
1. Label each pane of glass with location and orientation within the sash so that the historic glass can be returned to its original location and orientation if vacuum insulated glazing cannot be successfully installed to replace historic single pane glazing. Use painters' tape to label glass and consistently label on either interior or exterior to avoid confusion at reinstallation.
 2. Remove all face glazing compound from each window sash using steam, infrared heat or other approved method that does not damage glazing or sash components.
- C. Paint Removal: Paint will be removed from sashes and frame as needed in order to ensure successful adhesion of new paint over all surfaces scheduled to be receive paint coatings.
1. All paint removal shall be executed in compliance with all applicable federal, state, and local regulations.
 2. Paint removal technique shall be selected that limits damage to the wood substrate.
- D. Hardware Removal: All hardware will be removed in order to refurbish sash and hardware.
1. Scribe paint around hardware so that removal of hardware does not splinter adjacent wood.

2. Remove paint from hardware so that any screws may be loosened.
 3. Tag and retain all hardware and screws.
- E. Frame Restoration.
1. Carefully remove dirt and debris from frame, including loose dirt inside window frames accessible from jamb access panels.
 2. Carefully remove extraneous nails, staples, bolts, hooks, etc., from window frame and wood trim.
 3. Protect frame and opening from weather.

3.04 **DUTCHMAN REPAIRS**

- A. General: Provide dutchman repairs where wood is structurally compromised. Wood repairs will not be made for aesthetic purposes. Dutchman repairs shall provide continuous smooth surfaces matching planes and profiles of wood members being repaired. Dutchman shall match wood being repaired in specie and cut.
- B. Preparation: Neatly cut out existing opening as required to provide a prismatic void. Wherever possible create voids that will provide mechanical attachments as in dovetails. The amount of wood removed should be minimized but the amount should include all damaged wood and extend just past damaged wood to prevent spread of any fungus contained therein. Cut away area will provide ample glue surface.
- C. Dutchman: Cut dutchman to exactly fit void, with exposed portion matching original profile of woodwork and just slightly proud of original surface. Orient grain of dutchman parallel to grain of element being patched. Where deterioration or loss at end of component requires dutchman repair, use a diagonal scarf joint for end-to-end joint between dutchman and remaining portion of component.
- D. Installation: Clean glue surfaces with acetone or denatured alcohol. Insert dutchman using specified adhesive and clamp in place until glue is set. Where clamping is not feasible, use small brads; remove brads and fill holes after adhesive has set.
- E. Surfacing: Plane or scrape dutchman to provide smooth continuous surface coplanar with adjacent wood. Do not damage or alter profile or finish of adjacent wood.

3.05 **EPOXY CONSOLIDATION AND PATCHING**

- A. Preparation: Following paint removal to bare wood, remove dirt, dust, and other contaminants that might interfere with effectiveness of epoxy consolidation and patching using soft bristle brushes and clean oil-free compressed air.
- B. Manufacturer's Recommendations: Follow epoxy resin manufacturer's instructions for mixing of components, application temperatures, and material handling and manufacturer's recommendations for selection of resins, hardeners, and oilers for each type of consolidation and patching required.

- C. Consolidation and Patching of Wood with Deterioration Less Than 3/4-Inch Deep:
Consolidate deteriorated wood, fill surface to restore profile, and sand to provide surface matching adjacent wood surface.
1. Brush apply a heavy coat of epoxy wood consolidant onto clean wood surfaces and allow to soak into wood. Apply an additional coat while previous coat is uncured to completely saturate deteriorated areas of wood.
 2. Fill depressions, voids, gouges, and cracks with epoxy wood filler to restore original planes and profiles. Apply wood filler before consolidant has completely cured.
 3. Thoroughly sand cured epoxy resin to provide proper surface for bond of paint without altering wood profile. (Curing time varies with ambient temperature and product used.) Sand surfaces smooth. No scratches from sanding shall be visible after wood element has been painted.
 4. Protect epoxy resin from prolonged exposure to ultraviolet light. Apply primer within forty-eight (48) hours after resin has cured.
- D. Consolidation and Patching of Wood with Deterioration 3/4-inch or Greater in Depth:
Prepare wood to receive consolidant, consolidate deteriorated wood fill surface to restore profile, and sand to provide surface matching adjacent wood surface
1. Drill 3/8-inch-diameter holes from surface of deteriorated wood member through deteriorated wood and into sound wood on approximately 3-inch centers. Stagger holes.
 2. Pour low modulus, low viscosity epoxy wood consolidant into each hole until hole has been filled. As epoxy is absorbed into wood, top off holes with epoxy until no hole will accept additional consolidant (if the wood being treated contains water, the water will be forced out by the epoxy without affecting the procedures).
 3. Brush apply a heavy coat of epoxy wood consolidant on remaining weathered portions of wood element. Repeat brush application until all surfaces being treated are saturated with epoxy wood consolidant and are flush and smooth.
 4. Fill depressions, voids, gouges, and cracks with wood filler to restore original planes and profiles. Apply wood filler before consolidant has completely cured.
 5. Thoroughly sand cured epoxy resin to provide proper surface for bond of paint without altering wood profile. (Curing time varies with ambient temperature and product used.) Sand surfaces smooth. No scratches from sanding shall be visible after wood element has been painted.
 6. Protect epoxy resin from prolonged exposure to ultraviolet light. Apply primer within forty-eight (48) hours after resin has cured.

- E. Patching Holes, Cracks, Depressions, and Gouges: Apply epoxy wood consolidant, fill depressed areas of surface with epoxy wood filler to restore profile, and sand to provide surface matching adjacent wood surface.
1. If area to be patched has been consolidated, apply epoxy wood filler before consolidant has completely cured.
 2. If area to be patched has not been consolidated, brush-apply generous coat of wood consolidant to clean sound surface.
 3. Before consolidant has cured, fill holes and other irregularities with epoxy wood filler flush with surface of wood, matching profile of original wood surface.
 4. Thoroughly sand cured epoxy resin to provide proper surface for bond of paint without altering wood profile. (Curing time varies with ambient temperature and product used). Sand surfaces smooth. No scratches from sanding shall be visible after wood element has been painted.
 5. Protect epoxy resin from prolonged exposure to ultraviolet light. Apply primer within forty-eight (48) hours after resin has cured.

3.06 COMPONENT REPLACEMENT

- A. General: Fabricate new components for any components which are deteriorated in entirety and cannot be repaired with Dutchmen and epoxy.
- B. In kind replacement: Except as specifically indicated otherwise, provide replacement elements of same species with configurations, profiles, dimensions and joinery et al exactly matching those of existing elements.
1. Profiles: Remove coatings from profiles of existing elements before recording profiles to produce molding cutters to match existing profiles.
 2. Machining and Surfacing: Machine and surface all new and replacement wood elements to provide smooth even surfaces without saw marks or plane marks. Wood with surface irregularities, including but not limited to scratches, saw marks, and plane knife marks, visible after finish has been applied will be rejected and shall be replaced with properly finished wood elements at no additional cost.

3.07 GENERAL REFURBISHMENT SEQUENCE – EACH WINDOW SASH

- A. Carefully remove and label all window sashes, and hardware removed for restoration.
1. Removal of sashes will require removal of inside stops and parting beads.
- B. Carefully remove existing glazing and glazing putty.
- C. Carefully strip paint from sash as necessary to repair sash and provide a proper substrate for successful application of new paint coatings.

- C. Carefully prime and apply specified paint coatings to sash.
- D. Carefully install new glazing where indicated.
- E. Install paint top coats
- F. Carefully install restored existing hardware, new hardware, and weather-stripping.
 - 1. Carefully make final adjustments to weather-stripping and hardware to achieve optimum operation.
- G. Carefully install new inside stops and parting beads.

3.08 **RESTORATION OF EXISTING HARDWARE**

- A. General: Remove historic sash hardware from existing sash to be replaced and remove sash pulleys from jambs. Store hardware in plastic bags or containers identified with sash number to ensure that each unit of hardware is reinstalled in its original location.
- B. Remove lacquer coatings with acetone or lacquer thinner.
- C. Strip paint coatings by dipping in chemical paint stripper.
- D. After removal of paint and other coatings, thoroughly rinse in appropriate solvent and wipe dry with soft cloths.
- E. Replacement Parts: Provide replacement parts, including operating parts and fasteners, matching original parts in metal and alloy, configuration, size, and finish for all missing and damaged parts.
- F. Remove scratches and buff surfaces using metal cleaning and polishing pads and polishing compound, as necessary. Do not scratch finish with abrasive pads or wire brushes.
- G. Lubricate operating parts.
- H. Store units in protective packaging.
- I. Provide all missing fasteners for hardware. Fasteners must match all visual aspects of existing fasteners.

3.09 **FRAME RESTORATION**

- A. Preparation.
 - 1. Carefully remove dirt and debris from frame, including loose dirt inside window frames accessible from jamb access panels.
 - 2. Carefully remove extraneous nails, staples, bolts, hooks, etc., from window frame and wood trim.

3. Protect frame and opening from weather. Dry all wood to moisture content below 15 percent.
 4. Strip paint from exterior frame members and sills. Use care to avoid damage to wood and adjacent building finishes.
- B. Frame Repair Procedure: Inspect all frame components for condition. Test wood using an ice pick and moderate hand pressure to determine extent and depth of deterioration. Repair and replace wood elements as required to provide sound frame with all members having original planes and profiles.
1. Member Replacement: Disassemble frame as required to remove severely deteriorated components. Provide new wood members matching original members as specified in Article "Member Replacement" below.
 - a. Partial Wood Replacement: Where more than fifty (50) percent of wood in frame member is deteriorated, remove accessible portion of frame, consolidate remaining portion, and provide Dutchman to replace removed portion of frame. Install Dutchman using wood dowels (three (per member) and specified adhesive.
 2. Member Repair: Consolidate areas of members where wood is deteriorated, consolidate and patch areas where wood is missing, and fill small holes (less than 1-inch x 1-inch x ½-inch deep), cracks, and open joints using epoxy fillers. Provide dutchman repairs for holes equal to or greater than 1-inch x 1-inch x ½-inch deep. Follow requirements of Article 3.11 "Wood Element Restoration," below.
 3. Joint repair: Tighten loose and open joints in frame using specified adhesive and finishing nails properly countersunk. Fill all joints that cannot be closed without dismantling the window frame with epoxy wood filler.
- C. Finishing
1. Sanding and Cleaning: Chemically strip wood frame elements to wood surfaces. Dispose of chemical stripper as required by law for lead containing material.

3.10 PAINTING

- A. General: Paint and finish new and restored elements of frames and trim to match original finishes. Prime and paint sash in controlled environment according to manufacturer's instructions. Comply with all requirements listed in Section 09 90 00 – "Painting and Coating".
- B. Prepare substrates for repairs by hand sanding them with medium-grit and fine-grit sandpaper.
- C. Remove rough spots in surfaces. Fill-in voids and depressions with approved and compatible epoxy/compound.

- D. After substrate is sanded, vacuum all surfaces and remove remaining dust with barely damp dust-free cloth. Allow surfaces to dry completely before priming.
- E. Apply one coat of primer at Manufacturer's required wet-film thickness to all surfaces of the sash including putty beds. On all window sashes, extend primer and paint 1/16" onto glass to seal glazing. If sash is operable, paint bottom edge to protect wood.
- F. Lightly sand surfaces after the primer has dried and clean of all dust.
- G. Apply intermediate and finish coats at Manufacturer's required wet-film thickness. Primer, intermediate, and finish coat shall comply with dry-film thicknesses listed in Section 09 90 00 – "Painting and Coating". Contractor shall perform regular wet-film thickness tests during application to ensure that applications meet Manufacturer's required minimum wet-film thicknesses, and to ensure applications dry-down to meet Project Document-required dry-film thicknesses.
- H. Immediately after installation touch-up any disturbed areas of paint

3.11 **INSTALLATION OF REFURBISHED SASH**

- A. General: Install refurbished existing sash per contract. At completion of installation, windows shall be complete with all components and with unblemished paint and finish coats. All operating sashes shall operate smoothly over entire height but be limited in operation to 4-inches, and weather-stripping shall provide a weatherproof seal.
- B. Fitting: Fit properly in frame.
- C. Interior Stops: Install new interior stops and parting beads, adjusting for proper fit.
- D. Sash Balances: Install sash with sash chains/cords and weights properly adjusted to allow sash to close securely, open completely to top of track, and remain stationary at any position in track.
- E. Sash Hardware: Install any hardware, including sash lifts and sash locks, on restored sash in the same locations as originally. Adjust sash locks for smooth easy operation and firm, secure locking.
- F. Wax: Treat unpainted sides of stiles and frame with wax for ease of window operation and wood protection.
- G. Weather-stripping: Install weather-stripping following manufacturer's requirements to ensure smooth operation and weathertight closure.

3.12 **INSTALLATION OF SEALANT JOINTS**

- A. General: Install new sealant joints at:
 - 1. Interior and exterior air and moisture sealant joints between all fixed window sashes and the window frame.

3.13 SPOT PAINTING AND REPAIRS CARRIED OUT ON-SITE

- A. All spot painting repairs to shop painted wood that is restored off site, including but not limited to window sashes, or select window frames, exterior casings or interior trim, shall be carried out only during acceptable environmental conditions for the application of paint.

3.14 FIELD QUALITY CONTROL

A. Contractor Responsibilities:

1. The Contractor shall be responsible for the quality control of all of their own work, as well as quality of work performed by their Sub-contractors per this Specification and related Specification(s), which are considered part of the work under this Specification.
2. The Sub-contractor shall employ workers that are trained and approved by the material manufacturer to install the system.
3. The Contractor shall notify the Architect and the Building Envelope Consultant of any conflicts that may result in a deviation from the Manufacturer's Specifications, industry standards, code compliance, job safety, or function as a result of the Project's Scope of Work, Specifications, and/or Project Drawings.
4. If the Architect, Building Envelope Consultant or Consultant's Monitor, the Owner's Project Manager, or Manufacturer determine that the quality of the work does not conform to the Specifications, Project Drawings, and/or Manufacturer's requirements, as well as industry standards, the Contractor must correct all deficiencies and advise the Architect, Consultant, and Manufacturer of their proposed corrective actions. All efforts are to be made to prevent installation of building envelope components and systems in a deficient or non-compliant manner. Corrective actions must be taken immediately to prevent further damage to the building. Deficient and/or non-conforming installation and resulting damage will be corrected at Contractors expense.
5. The Contractor and their Sub-contractor must demonstrate the ability to perform the work in a quality, timely manner with minimal noise and disruption to or impact on Faculty, Students, the Public, and the Property.

B. Testing and Monitoring:

1. Owner may engage special inspectors and/or Envelope Monitor to perform tests, monitoring and inspections and prepare reports. Such observation shall not relieve the Contractor of responsibility for proper execution, thorough completion, quality control, and quality assurance of the Contractor's and Sub-contractor's work. Contractor to provide access to scaffolding, manlift and work areas as needed to perform monitoring, testing, and pre-completion and completion surveys. Retesting of materials and/or work that fails to comply with specified requirements shall be done at Contractor's expense.

3.15 ADJUST AND CLEAN

- A. General: Within one (1) week of date set for inspection to establish Substantial Completion, examine windows and adjust for optimum operation.
- B. Adjust and check each window and each operating item of hardware to ensure proper operation and function of every unit.
- C. Lubricate moving parts including existing pulleys with machine oil. Replace elements that cannot be adjusted and lubricated to operate freely and smoothly for the application made. All ropes to be new.
- D. Clean new and existing finish hardware.
- E. Clean glass.

3.16 PROTECTION

- A. Well-secured tenting and temporary protection requirements: Contractor is responsible for providing temporary protection of substrates and partially installed materials and systems in order to achieve dryness and quality installation requirements per Project Documents. Temporary protection must be installed in a well-secured, robust and complete manner to withstand rain, wind, snow, and other weather events to keep construction dry and to expedite installation as necessary to make progress and avoid delays.
- B. Protect windows from damage or deterioration until time of final completion.

END OF WOOD WINDOW RESTORATION SECTION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Project Drawings and general provisions of the Construction Contract, including General and Supplementary Conditions, Division 01 Specification Sections and bidding requirements, apply to the work of this Section.
- B. Technical publications, standards, and reference documents as outlined in individual Technical Specification Sections and as indicated on the Project Drawings.
- C. Current Seattle Building Code, and all other applicable codes and regulations required for the Project.
- D. This Specification shall be read as a whole by all parties concerned. Each Section may contain more or less the complete work of any trade. The Contractor is solely responsible to make clear to the Sub-contractors the extent of their work and coordinate overlapping work.

1.02 SUMMARY

- A. Glass for:
 - 1. Wood windows as indicated in the Project Drawings.
- B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

- A. Division 0 & 1 – All Related Sections
- B. Section 01 11 10 – Summary of Hazardous Materials Work
- C. Section 08 15 20 – “Wood Window Restoration”, for historic wood sash refurbishment work that occurs before and after the glazing work of this Section.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
- C. ASTM C1036 - Standard Specification for Flat Glass.
- D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants.
- F. ASTM E773 – Test Method for Seal Durability of Sealed Insulating Glass Units.
- G. ASTM E774 – Specifications for Sealed Insulating Glass Units.

- H. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings.
- I. ASTM E1996 – Standard Specifications for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Wind borne Debris and Hurricanes.
- J. ASTM E2188 – Standard test Method for Insulating Glass Unit Performance.
- K. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
- L. GANA (SM) - GANA Sealant Manual; Glass Association of North America.
- M. SBC – Seattle Building Code 2021, Chapter 24 “Glass and Glazing”.
- N. SEBC – 2021 Seattle Existing Building Code
- O. SEC – 2021 Seattle Energy Code.

1.04 **SUBMITTALS**

- A. See Section 01 33 00 - Basic Requirements, for submittal procedures.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- E. Glazing Schedule: List glazing types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- G. Mock-ups: Mockups per Section 01 43 39 – Provide one (1) mockups of each type of glazing type to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1.05 **INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installers and Manufacturers of insulated glazing units, units with sputter-coated, low-e coatings.
- B. Installation Instructions: Provide Manufacturer’s published installation instructions for each product. Include requirements for cleaning, priming, joint size ratios, adhesion testing, and perimeter conditions requiring special attention. Include information for accessories.
- C. Product Test Reports: For coated glass and insulated glazing units for tests performed by a qualified testing agency.

- C. Safety Data Sheets (SDS): For glazing compounds, primers, glazing cleaners, or other products that will be field applied as part of the work.
- D. Sample Warranties: For Manufacturer and Special Warranties.

1.06 **ADMINISTRATIVE REQUIREMENTS:**

- A. Coordination:
 - 1. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- B. Preinstallation Meetings: Conduct meeting at Project Site.
 - 1. Preinstallation Meeting to be conducted on-site with a list of participants for Pre-Installation Meeting e.g. Owner's Project Manager, Project Architect, Envelope Consultant and Envelope Monitor, Contractor, Superintendent, and designated lead foreman (lead installer), and Sub-contractor/installers whose work interfaces with or affects the installation of the system.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review temporary protection requirements for glazing during and after installation.

1.07 **QUALITY ASSURANCE**

- A. Manufacturer's Qualifications for Insulating Glazing Units with Sputter-Coated, Low-E Coatings: Insulating glazing manufacturer who is approved and certified by coated glass manufacturer.
- B. Contractor and Trade-specific Sub-contractor/Installer shall provide experienced supervisors (i.e. Superintendent and Foreman or Foreperson) and crew personnel to perform the work, whom are trained in the application of the materials and procedures specified in this Specification.
- C. Installer Qualifications: Installer to have at least 5-yers experience of successful installations of similar size or scope.
- D. Crew size shall be adequate to complete the Project per the agreed upon Project Schedule and Substantial Completion Date.
- E. Foreman required to have a complete set of the Project Manual, Project Drawings, and Product Manufacturer's Installation Instructions easily accessible on-site while work is in progress.
- F. Contractor shall provide documentation from the Manufacturer that Trade-specific Sub-contractor/Installer meets the experience and training requirements for the specified

materials and systems. Contractor shall maintain on-site supervision continuously to assure on-going quality control for superior quality fenestration assemblies.

- G. Manufacturer's Responsibilities: The Manufacturer's Technical Services Representative shall be available for technical information and project-site meetings and be thoroughly experienced with the products to be installed, installation requirements, and practices, quality control of the installation, and with published special consideration in the geographical area and climate where construction will take place.
- H. Notify Architect, Buildings Envelope Consultant and Owners Project Manager at least fourteen (14) days prior to commencement of Work.
- I. On-Site Observation and Testing:
 - 1. Owner reserves the right to have the Building Envelope Consultant perform observation or monitoring of installation.
 - 2. Observations do not relieve the Contractor of responsibility for proper execution and thorough completion of Work.
 - 3. Owner reserves the right to have Building Envelope Consultant perform tests deemed necessary to determine compliance with Section requirements. Building Envelope Consultant and Owner's Project Manager.
- J. Provide complete, watertight, and weatherproof building envelope systems and assemblies. Establish and follow best practices for trade and implement quality control and quality assurance to ensure successful completion of building envelope systems.
- K. No modifications to the Specification, Drawings, or substitutions of specified products shall be made without direct approval of Architect, Building Envelope Consultant, Owner's Project Manager, and the Seattle Department of Neighborhoods Landmarks Preservation Board.
- L. Glass testing Agency Qualifications: Qualified independent testing agency accredited per NFRC CAP 1 Certification Agency Program.
- M. In-situ mockups shall be constructed, which are to be reviewed for potential approval or rejection by the Architect, Building Envelope Consultant or Consultant's Monitor, Owner's Projects Manager, and the Seattle Department of Neighborhoods Landmarks Preservation Board. Approved mockups may remain as part of the work, and approved mock-ups indicate Contractor may commence with remainder of associated work.

1.08 DELIVERY, STORAGE, AND HANDLING:

- A. Protect glazing materials per manufacture's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun or other causes of damage.
- B. Comply with insulated glazing manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

- C. Delivery, Storage & Handling: Deliver materials to shop undamaged and reglazed wood sashes to site undamaged. Properly store and handle to prevent damage after delivery.

1.09 **FIELD CONDITIONS:**

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.10 **WARRANTY:**

- A. Glazing and all glazing components to be warranted Ten (10) years from the date of final completion. Applies to all Coated-Glass products, Laminated Glass and Insulating Glass. See also Section 2,02 PERFORMANCE REQUIREMENTS – EXTERIOR GLAZING ASSEMBLIES, B.

PART 2 PRODUCTS

2.01 **MANUFACTURERS**

- A. Float Glass Manufacturers:

- 1. Cardinal Glass Industries; www.cardinalcorp.com/#sle (Basis of Design)
 - a. The Cardinal Glass Industries glazing listed here-in has been previously approved by The Department of Neighborhoods Landmarks Preservation Board as part of this project as shall be used as the basis of design.
 - b. Other acceptable manufacturers pending Landmarks Preservation Board Approval of glass manufacturer's and Low-E coatings.
 - i. Saint Gobain Glass; www.saint-gobain-glass.com
 - ii. Vitro Architectural Glass; www.vitroglazings.com

- B. Vacuum Insulated Glazing Manufacturers:

- 1. Luxwall, Inc; www.luxesll.com
 - a. Luxwall listed here-in has been previously approved by The Department of Neighborhoods Landmarks Preservation Board as part of this project as shall be used as the basis of design.
 - b. Other acceptable vacuum insulated glazing manufacturers pending Landmarks Preservation Board Approval of glass manufacturer's and Low-E coatings.
 - i. Vitro Architectural Glass; www.vitroglazings.com

- C. Substitutions: Refer to Section 01 60 00 – Product Requirements
1. Substitute glazing for approval for use in vacuum insulated glazing (VIG's) for wood windows will require a minimum 12x12" vacuum insulated glazing sample including coatings to be photographed next to the existing single-pane glazing at McGilvra Elementary School for comparison and final approval by The Department of Neighborhoods Landmarks Preservation Board.

2.02 PERFORMANCE REQUIREMENTS – EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies meeting or exceeding the requirements listed below.
1. U-factor (VIG Only): 0.063 +/- 0.004 (BTU/h-Ft²-F)
 2. SHGC: 0.35 +/-0.02
 3. Visible Light Transmittance: 69% +/- 1%
 4. Visible Light Reflect Out/In: 12% +/- 1%
- B. Glazing and all glazing components to be warranted Ten (10) years from date of final completion. Applies to all Coated-Glass products, Laminated Glass and Insulating Glass.

2.03 VACUUM INSULATING GLAZING UNITS

- A. Type VIG - Vacuum Insulating Glazing Units
1. Application: All exterior glazing unless otherwise indicated.
 2. Conformance: ASTM E 2190, ISO 19916-1, and EN1279:1-5
 3. Outboard Lite: Float glass, 5/32 inch (4 mm) thick.
 - a. Tint: Clear (match existing)
 - b. Low E2-270 Coating: on face #2
 4. Vacuum Space: 0.02 inch (0.25 mm) wide, hermetically sealed, vacuum space.
 5. Inboard Lite: Float glass, 5/32 inch (4 mm) thick.
 - a. Tint: Clear (match existing)
 6. Vacuum Ports: Located on bottom corner of Inboard Lite.
 7. Total Thickness: 5/16 inch (8 mm).

8. Maximum U-value of 0.063
9. Total Solar Heat Gain Coefficient: 0.35 max.

2.04 LAMINATED GLAZING UNITS

A. Type L – Laminated Glazing Units

1. Application: For use ONLY in locations as indicated in the Project Drawings, where existing historic glass is smaller than the 12 inches x 18 inches manufacturer's minimum size for vacuum insulated glazing.
2. Outboard Lite: Laminated float glass, 5/32 inch (4 mm) thick.
 - a. Tint: Clear (match existing)
 - b. Low E2-270 Coating: on face #2
3. Inboard Lite: Float glass, 5/32 inch (4 mm) thick.
 - a. Tint: Clear (match existing)
4. Total Thickness: 5/16 inch (8 mm).
5. U-value of 1.1
6. Total Solar Heat Gain Coefficient: 0.35 max.

2.05 GLAZING COMPOUNDS

- A. Glazing Putty/Sealant: Paintable, low-modulus, high-performance, single compound, polyurethane-based, non-sag elastomeric sealant; Class A; ASTM C-920, Type S, Grade NS, Class 100/50, uses T, NT, G, A, O, M; Standard white color, as close to existing historic wood window paint as possible.
- B. Silicone Sealant for glass back bedding: Type S: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 50, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; Standard black color.

2.06 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4-inch (100 mm) x width of glazing rabbet space minus 1/16-inch (1.5 mm) x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Prior to procurement of vacuum insulating glazing units (VIG's), verify dimensions of all wood window sashes for glazing are correctly sized and within tolerance. Based on the age and handmade nature of historic wood windows, variations in the glazed opening sizes for each window should be assumed and that typical glass sizes will not occur even between relatively similar sized windows.
- B. Verify that wood window sash refurbishment is complete and that surfaces that received primer and intermediate paint coatings are complete and fully dry before the start of reglazing work.
- C. Verify that the perimeter of refurbished window sashes glazed openings are clean, free of obstructions that may impede work, and ready to receive glazing.

3.02 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry immediately before glazing. Remove and repair coatings not firmly bonded to substrates prior to glazing.
- B. Examine glazing units to locate exterior and interior surfaces. All vacuum port shall be installed on the Inboard Lite.
- C. Protect glazing edges from damage during handling and installation. Remove damaged glass for the Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and/or appearance.
- D. Review Glazing Installation Instructions for compliance per approved Shop Drawings and Manufacturer Requirements.

3.03 INSTALLATION – VACUUM INSULATING GLAZING IN WOOD WINDOW SASHES

- A. General: Comply with combined written instructions of glazing, sealants, gaskets, and other glazing material Manufacturer's, unless more stringent requirements are indicated, including those in reference glazing publications.
- B. Prime surfaces scheduled to receive sealant.
- C. Carefully install back bedding sealants in a neat continuous bead along the perimeter of the window sashes glazed opening.
- D. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.
- C. Carefully rest glazing on back bedding sealant setting blocks and push against glazing with sufficient pressure to attain full contact/adhesion with back bedding sealant.

1. Vacuum Insulating Glazing shall be installed so that any visible portions of the hermetically sealed edges are consistently exposed along the perimeter of the glazed openings when viewed from either the interior or exterior and if possible concealed by completely by glazing putty/sealant when viewed from the exterior.
- D. Carefully install paintable glazing putty/sealant in a neat and straight manner to closely match the angle of historic/original glazing putty and to retain original areas of visible glazing.
- E. See Specification Section 08 15 20 Wood Window Restoration for final finish coat painting of window sashes and exterior glazing putty/sealants.
- F. **Note: The Architect reserves the right to reject any work that does not conform or is subject to the Seattle Department of Neighborhoods Landmarks Preservation Board Certificate of Approval for Historic Glazing Replacement at McGilvra Elementary School. The Architect will reject any and all glazing or installed sealants that are damaged, that are not straight, that are poorly installed, improperly located or with improperly adhered sealants. The Contractor is responsible for all costs associated with repair or replacement of rejected glazing in wood window sashes. Unless otherwise approved by the Architect, rejected glazing work shall be repaired or replaced in a shop environment.**

3.04 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Protect glazing and window from contact with contaminating substances resulting from construction operations. Examine glazing surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 1. If contaminating substances do come into contact with glazing, remove substances immediately as recommended in writing by glazing manufacturer. Remove and replace glazing that cannot be cleaned without damage to coatings.
- C. Remove and replace glazing that is damaged during construction period.

3.05 CLEANING

- A. Remove glazing sealant materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

END OF GLAZING SECTION 08 80 00