Nathan Clifford School Building

Conditions Assessment Report

Submitted To:

The City of Portland

April 12, 2013

Prepared By:

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1. EXECUTIVE SUMMARY:

On January 24, 2013, the City of Portland issued a Request for Quotations to prepare a Conditions Assessment of the former Nathan Clifford School Building in preparation for the City issuing a future request for re-development proposals for the building and property. On February 20, 2013, the team of Winton Scott Architects and Becker Structural Engineers was selected by the CIty to complete the assessment report.

The purpose of the report as stated in the RFQ is as follows:

> *"The Assessment will identify the minimum necessary short and long-term repairs needed to stabilize and protect the structure from further deterioration and to preserve the building for future use and redevelopment. The assessment will be used to establish the minimum thresholds of repairs needed for the City's consideration of proposals by development teams interested in purchasing and redeveloping the school building. The City's goal for the assessment is to understand which repairs are needed from any credible proposal and an estimated value that must be secured within proposals to guarantee the short and long-term preservation of the structure."*

Based on the City's stated intent for the assessment, the Team focused on the building structure and envelope including masonry, flashings, roofing and windows. Evaluations of building systems (HVAC, Electrical, Plumbing, etc.) , deficiencies related to current building and fire safety code requirements, and hazardous materials were considered outside the scope of this report and therefore not undertaken. The findings in this report are based on review of the original building construction drawings and various reports completed for the City over the years, as well as on site observations. Cost estimates have been prepared with the assistance of Wright Ryan Construction using cost data from completed projects where similar repairs were implemented.

The report is organized into specific areas of assessment. Each assessment area includes a general written overview of found conditions and areas of concern followed by photo documentation and sketches as required. Recommended repairs are then outlined and a cost estimate for the repairs is provided along with a determination of time priority for the work to be completed. At the end of the report is a summary of findings listing all needed repairs, associated costs, and prioritization for completion.

Recommendations contained in this report are based on limited observations of existing conditions that were readily visible at the time of inspection. Invasive investigative procedures were avoided except at areas where flooring was removed as part of previous investigations to inspect structural connections between floor framing and exterior masonry walls. Cost estimates are based on conceptual repair strategies that have not been fully designed and detailed. The possibility exists that extensive investigation and testing could uncover additional conditions currently unknown to the team that could have an impact on how repairs are executed and the associated cost of those repairs.

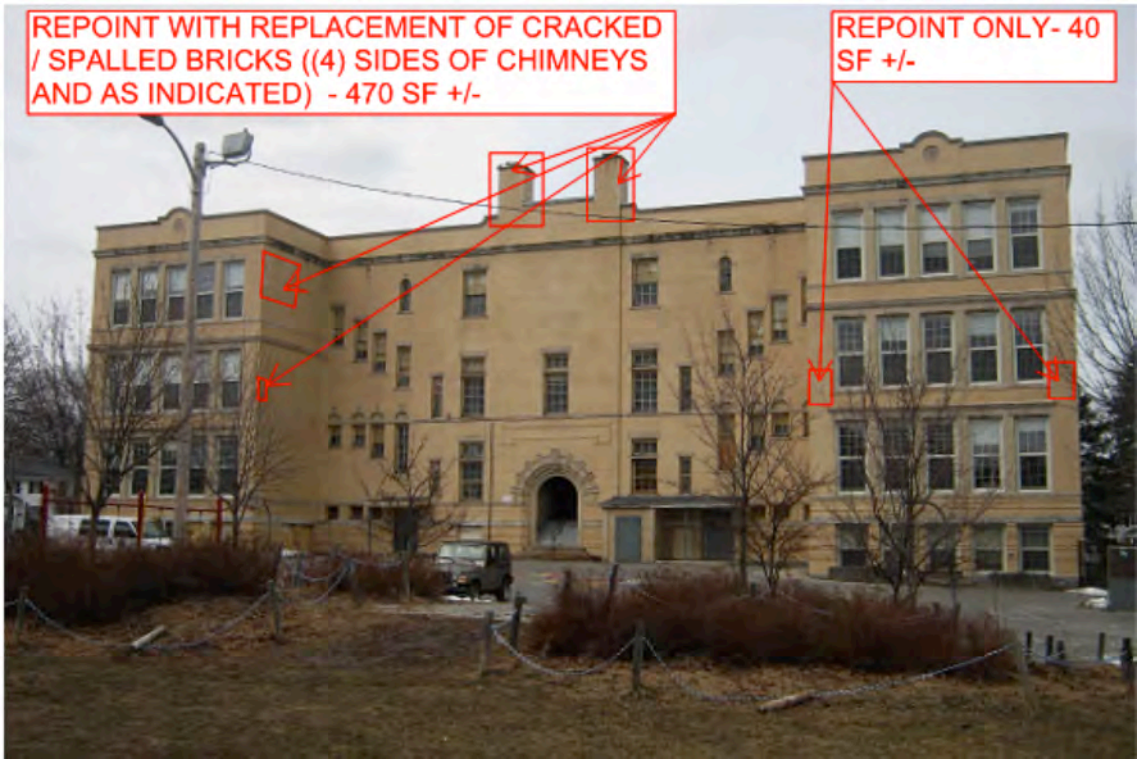
2. MASONRY WALLS ASSESSMENT:

General Narrative:

The exterior walls are constructed of solid, multi-wythe, load bearing brick masonry. Based on a review of on-site conditions and previous reports made available to us, it is evident that much work has taken place on these walls. The outer wythe has been nearly completely rebuilt on the south elevation (paved lot side) and the east elevation (Deane St. side). The outer wythe on the west elevation (Payson St. side) has been rebuilt on each end and at the parapet, while leaving the center portion apparently original construction. The outer wythe at the north elevation (Falmouth St. side) was apparently rebuilt at the parapet and at the west wing, leaving the majority of the elevation as original construction. The majority of the work was reported to have occurred between 1991 and 1998. Prior reports note that a bulge in the outer wythe of masonry, on the Deane St. side, had been present prior to rebuilding. This wall also has evidence of water infiltration at the interior side. It was not clear how recent the water damage is. Additional commentary on this wall appears in the Structural Assessment portion of this report.

Our evaluation of the exterior walls was based on visual observations conducted on March 27, 2013. A lift was utilized on the south, east, and west elevations. No bricks were removed in our review. In addition to our visual observations we also performed moisture absorption tests, by the Rilem test method, near ground level at the older brick and mortar at the north side, the newer brick and mortar on the east side, and the newer mortar on the south side. Our observations yielded the following recommendations at the south, north, and east elevations (no recommendations are being made for the west side):

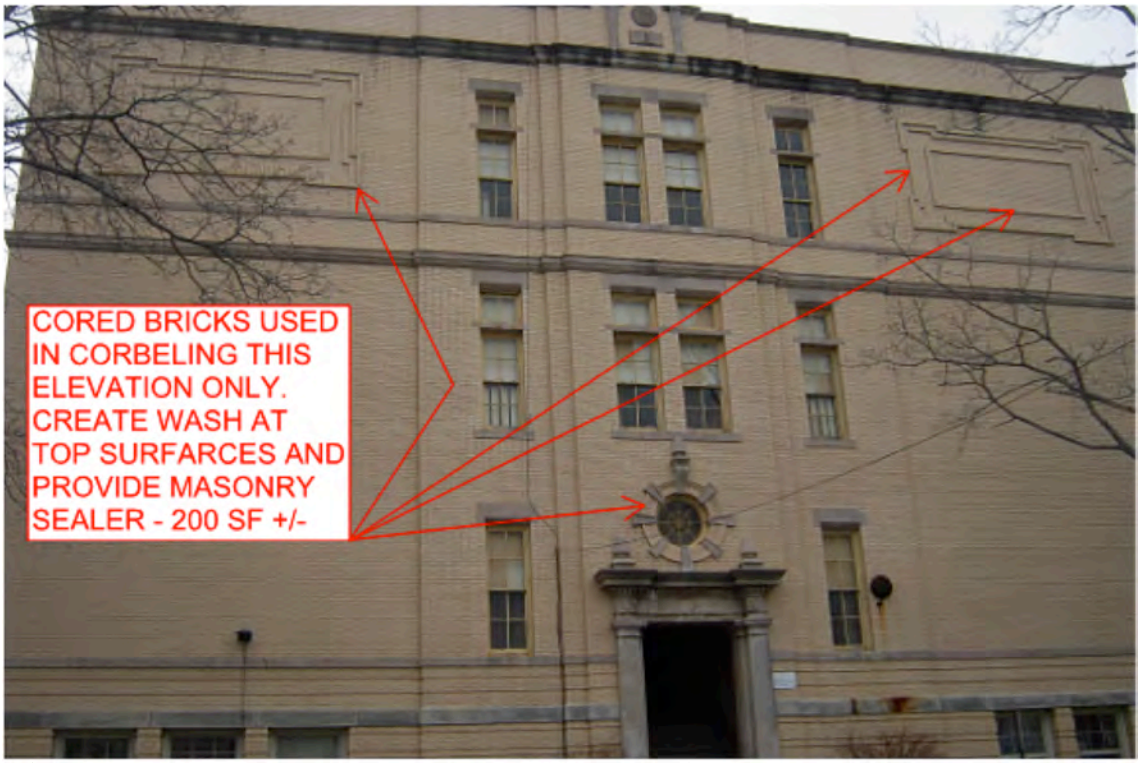
Found Conditions:



South Elevation

2. MASONRY WALLS ASSESSMENT:

North Elevation



East Elevation

2. MASONRY WALLS ASSESSMENT:

Conclusions:

In general, the masonry observed was in good condition. This is largely due to the amount that has been rebuilt over the last twenty years. While the stone elements at windows and decorative bands were observed to not be flashed, all appeared to have an integral wash and the mortar joints above appeared to be tight and of good condition. The moisture absorption tests performed did not indicate any areas with moisture absorption beyond normal. The highest level of moisture absorption was at the north façade mortar, which was expected due to the age and condition.

In addition to the minor crack stitching noted at the north façade, we are also recommending that crack stitching be performed at two interior masonry walls, where they meet the east end wall. This was the area of crack monitoring noted in previous reports (by others). We are recommending the crack stitching occur at each level, both sides of both walls, over the existing doors – approximately 150 LF of crack stitching.

Additional Masonry Considerations:

During our review, we noted two conditions of the masonry walls that are not associated with any proposed repairs, but are identified below as long term considerations. These are not included in the cost estimates.

1. In general, the mortar observed throughout our review, was noted to be very hard. This may act to restrict the drying, or "breathability" of the masonry walls. This can often serve to keep the bricks saturated and cause spalling with freezing conditions. This may be a contributing factor to the area noted for repair on the south elevation. While we do not feel that this is worth repointing the entire structure for, it should be noted that any future repointing work utilize a proper, softer mortar to allow drying.
2. Many decorative stone elements, especially the uppermost stone band, were observed to be heavily stained. Any future restoration efforts should include a cleaning and sealing of these elements.

Repair Cost Estimate:

General repointing at majority of north façade and select areas of south façade – approximately 4640 SF……$67,280.00

Repointing with replacement of cracked / spalled bricks at chimneys and select areas of south façade – approximately 470 SF……..……...…$23,500.00

Crack stitching at north façade and interior walls – approximately 222 LF ……..…$8,880.00

.

Create wash at corbelled cored bricks and sealing at east façade – approximately 200 SF… ……...……..…$7,000.00

Total Cost of Repair + 20% (GC, Contingency, Bonds, OH&P): ……..…$127,992.00

Priority of Repair:

Second Priority Critical repair that should be completed within 1 year.

3. STRUCTURAL ASSESSMENT:

General Narrative:

Our review of the building's structural elements was based on a review of original 1907 drawings, and visual elements observed during a site visit performed on March 27, 2013. The majority of the framing was concealed and no finishes were removed as part of our review. Structural elements that were observed appeared to match those identified on the original drawings.

A prior report (by others) identifies areas at the east and west ends where outward movement of the exterior walls was suspected. Flooring was removed to view masonry wall ties and wood block monitors were installed. These areas are still accessible. The majority of the monitor blocks appear to be tight to the exterior wall. The prior report concluded that there was no evidence of a structural instability, and attributed the minor movement to expansion and contraction associated with moisture. However, our observation of the existing wall ties at the end walls reveals a condition which represents a structural failure of the original tie system where the walls are no longer adequately tied to the floor diaphragms and a repair is required.

Our observations yielded the following recommendations:

Found Conditions:

▲ Typical End Wall Tie

3. STRUCTURAL ASSESSMENT:

South Stair (Inset Portion)

South Stair (Exterior Portion)

3. STRUCTURAL ASSESSMENT:

Conclusions:

Our review of the original drawings and our site review did not reveal any structural concerns, other than those noted above. The building appears capable of supporting the current loads associated with school use and the current dead loads. Proposed future uses will need to consider live loads increased over that of a school, or if additional finishes, and associated new dead loads, are anticipated. Residential units or dorm use is similar to school loading, but commercial office building use will require higher live load capacities. If new loads increase the demand on the existing structure, reinforcement and/or removal of existing finishes may be required. The roof was reviewed for additional snow load associated with an increase in insulation, and the roof appears to have the reserve capacity (with the removal of existing tar and gravel roofing) to support the increase.

Better wall anchorage needs to be implemented at each floor level of each end wall. For the purposes of estimating a basic probable cost, we have assumed the following:

1. Remove flooring and board sheathing for a width of 8' from inside of end walls, from exterior north/south walls to the interior masonry walls, at all floor levels and roof (to be coordinated with reroofing work) – approximately 3600 SF. This assumes intent is to preserve ceiling plaster; otherwise work could be done from below.
2. Install new ties at equal spacing set approximately 6' away from wall and anchoring to new blocking. We have assumed 96 ties total. Final design (by others) may determine if more or less anchors are required.
3. Galvanized threaded rod would extend from masonry wall to inset tie. Final design (by others) will determine if rods are bolted through the masonry with exterior bearing plates, or if they can be epoxied. Final detailing may also explore if the existing ties may be incorporated into the new work.
4. Replace floor and roof sheathing with (2) layers of ¾" plywood, glued and screwed.

At each of the four entrance stairs, the stairs transition from granite to steel. Corrosion is present at all four stairs, with the worst being at the east and west sides. We recommend these stairs be repaired / replaced in kind with new galvanized and coated steel elements. The east and west stairs may require complete replacement, while the north and south stairs may only require a tread replacement (to be determined by final design). The granite portion beyond the building face appeared to be in sound condition with the exception of the south stair, where we recommend the granite be removed, approximately 16 LF of 8" concrete frost wall be installed, and the granite steps reset. Site stairs removed from the building were not considered for this report.

Additional Structural Considerations:

If future additions are planned for this building, we recommend that consideration be given to constructing all additions as structurally independent of the existing building if the intention is to avoid a seismic upgrade of the existing building, per the International Existing Building Code.

Repair Cost Estimate:

Work associated with floor ties as noted above (select demo, tie installation, new sheathing installation): ……..…….....$46,080.00

Repair / replacement of steel stairs at inset portion of entries as noted above: ...$62,000.00

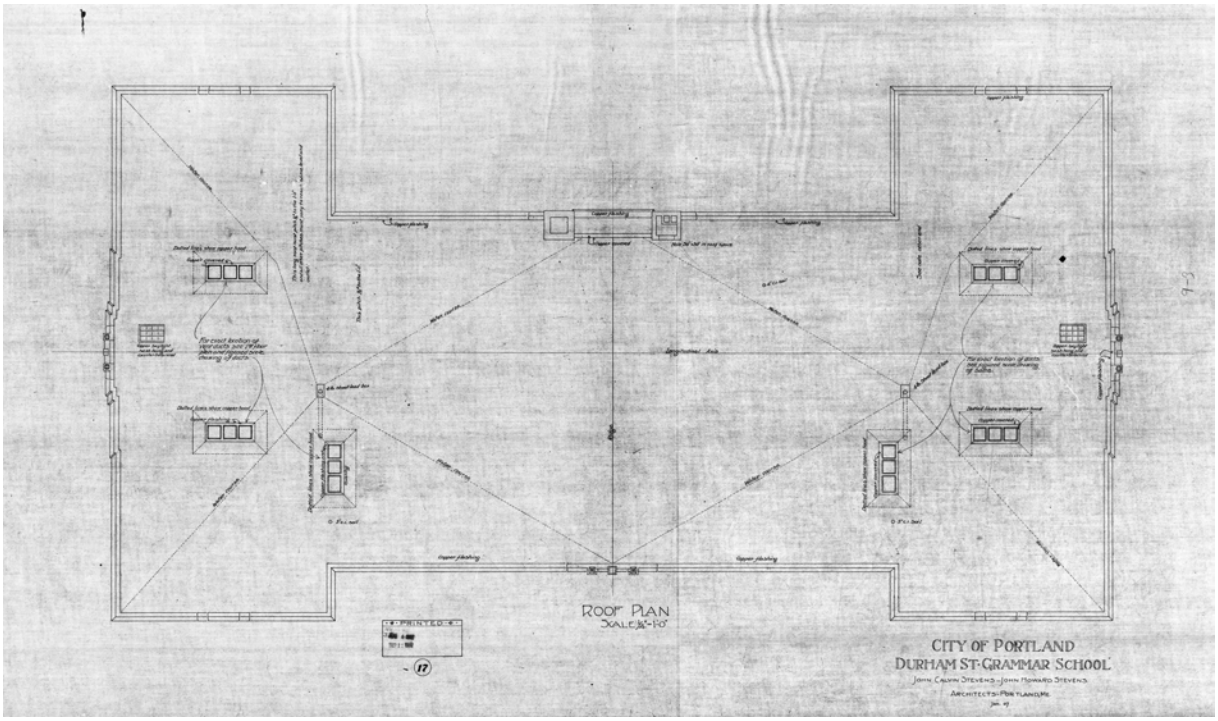
Removal of south side granite stairs, installation of concrete frost wall and resetting granite:……...$28,800.00

Total Cost of Repair + 20% (GC, Contingency, Bonds, OH&P): ……$164,256.00

Priority of Repair:

Second Priority Critical repair that should be completed within 1 year.

4. ROOF ASSESSMENT:



General Narrative:

The roof area is approximately 11,465 square feet and consists of ballasted built up tar roofing throughout. A +/- 2' band of newer EPDM membrane roofing has been installed along the entire perimeter as a repair to the junction between the roof surface and the parapet wall which presumably experienced water infiltration issues over the years. The built up roofing has multiple patches at locations of removed equipment or other areas where leaks developed (evidence of past and active leaks is present at several locations on the third floor) and while partial attics have some blown in insulation, the roof is not insulated at the deck. Metal cap flashings at the parapet walls appear to be in good condition throughout.

The original building design incorporated passive ventilation chimneys that were gathered into (6) groups of 3 shafts at the roof. Each of these was covered by a metal hood supported on decorative steel supports. Of the six hoods, one has been removed completely and roofed over. The other five hoods are in various stages of disrepair with many or all structural supports missing and hood roofs laid loosely on the roof. Structural supports tie into the roof structure and are set in pitch pockets that are dried out and cracked. There are also various other roof penetrations such as exhaust vents and plumbing vents that are flashed into the roof with copper flashings. The roof pitches approximately 1/2" per foot toward two functional roof drains. No significant standing water was observed on the roof surface.

At a centered location on the building's south facade there are two masonry chimneys engaging the wall. They show signs of having been repaired which is confirmed by written documentation provided by Portland Public Schools showing repairs were made in the summer of 2008. Despite the repair work, the chimneys have experienced additional cracking and mortar deterioration and are again in need of further repair.

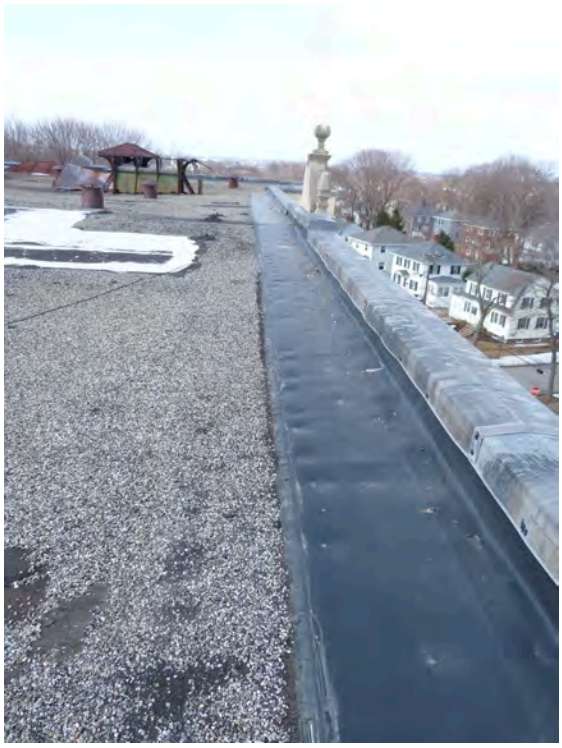
4. ROOF ASSESSMENT:

Found Conditions:

The following photographs document existing conditions of the building roof.

▲

General roofscape showing deteriorated vent hoods, patches in built up roofing, & various vents and stacks that penetrate the roof



◀

Area of patched in strip of EPDM roofing along building perimeter.

4. ROOF ASSESSMENT:

Ventilation hoods and close up detail of deteriorated pitch pocket where steel supports penetrate roof to fasten to underlying structure.

▲ Example of previously patched built up roofing with cracking along the joints.

▼ Area of former steel post penetration that has been patched. Cracking visible along edges

4. ROOF ASSESSMENT:

▲ Metal parapet wall cap flashing is in good condition at all locations.

▼ Chimneys centered on south facade. Previous repairs have deteriorated with loose mortar and some cracking evident.

4. ROOF ASSESSMENT:

▲

◀ Water damage from roof leaks at third floor ceilings and floors.

▼

4. ROOF ASSESSMENT:

Conclusions:

The existing built up roofing is beyond its useful life and should be removed and replaced with new EPDM membrane roofing. At the time of roof replacement, existing abandoned equipment and vents should be removed complete to eliminate unnecessary penetrations and flashings.

When replacing the roofing, it would also be prudent to install rigid insulation on the deck. According to the 2009 IECC, in a commercial re-use of the building such as educational, or office use, a minimum of R-20 continuous insulation on top of the roof deck would be required. In a residential re-use of the building the IECC requires R49 insulation. However, the IECC indicates that in cases of buildings that are listed on a local or national historic register, conformance with IECC requirements is not required.

The existing parapet walls are high enough to accommodate about 6" of additional thickness to the roof assembly providing an R 42 roof without modifying the cap flashings (i.e. the look of the building) Adding insulation to the roof will increase snow loads on the existing roof framing but review of existing framing plans indicates that the existing structure can support the increased snow load posed by adding insulation without the need for reinforcement.

It is assumed that no asbestos containing materials are present in the existing roofing and associated flashings. A document titled "Facility Overview" provided by the city and prepared in 2009 summarizes ongoing repair and maintenance needs for the building. This summary identifies several asbestos containing materials present in the building such as pipe insulation, floor tile, plaster, etc. but there is no mention of asbestos in the roofing. However, it is not known if the roof was ever tested.

If ACM is present in the roofing or flashing materials, the cost of removal is relatively small. It can be handled by the roofing contractor as removal does not need to be done under containment. Additional costs are limited to disposal of the material only.

Repair Cost Estimate:

Removal of existing roofing:.....$17,200

Removal of existing equipment and misc. deck repairs:.....$8,500

Installation of new EPDM Membrane w/ 6"
rigid insulation, flashings & accessories:.....$112,000

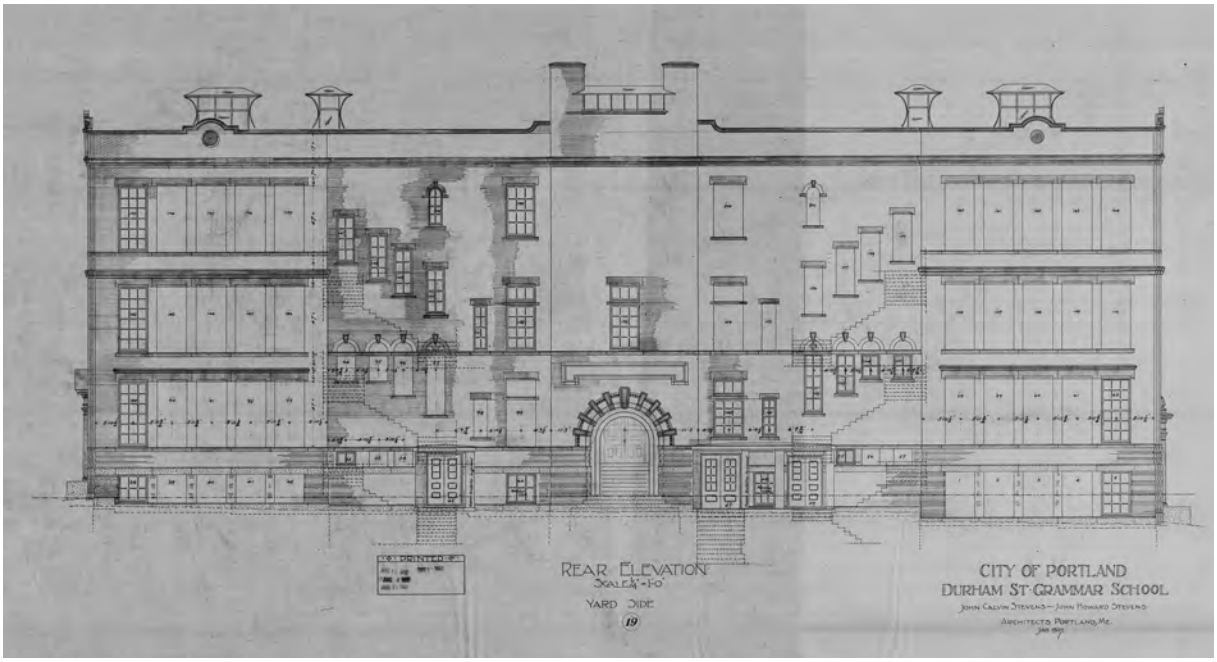
Structural Upgrades/Repairs..... $15,000

Total Cost of Repair + 20% (GC, Contingency, Bonds, OH&P): …… ……..$183,240.00

Priority of Repair:

As the roof is the first line of defense a building has against water infiltration both into the interior spaces and the exterior masonry walls, roof replacement should be a top priority to help ensure the longevity of the structure. Complete repair as soon as possible.

5. WINDOW ASSESSMENT:



General Narrative:

The windows at the Nathan Clifford School Building are a mix of original wood double hung windows and newer aluminum replacement double hung windows manufactured by Traco Window Corp.

The existing windows all fall into the same general category for the most part with the majority having sashes that are in fair to good condition for their age and exterior frames that are in fair condition. A large portion of the wood sills are heavily weathered with multiple open fissures in the grain. Many of the existing sash were glazed with a polycarbonate material that has become clouded with age to the point where most can no longer be seen through. Glazing putty is dry, brittle and falling out in most locations. Sash chords are broken on many units as well.

The wood windows, while in need of significant restoration, are all intact enough to be repaired and brought back to serviceable condition. Sashes will require removal, stripping, joint repairs, replacement of weatherstripping, and reglazing of all glass. Wood frames can be repaired and stripped in place with missing and completely rotted moldings being replaced in kind. The wood sills require treatment with wood epoxy consolidant and filler to restore their structural integrity and create a solid smooth surface for paint to adhere to. The windows are only single glazed so interior or exterior storm windows should be considered to improve thermal efficiency.

The newer aluminum replacement windows are in good to excellent condition, however the sealant used to seal the windows to the brick is starting to show its age and should be replaced in the near future.

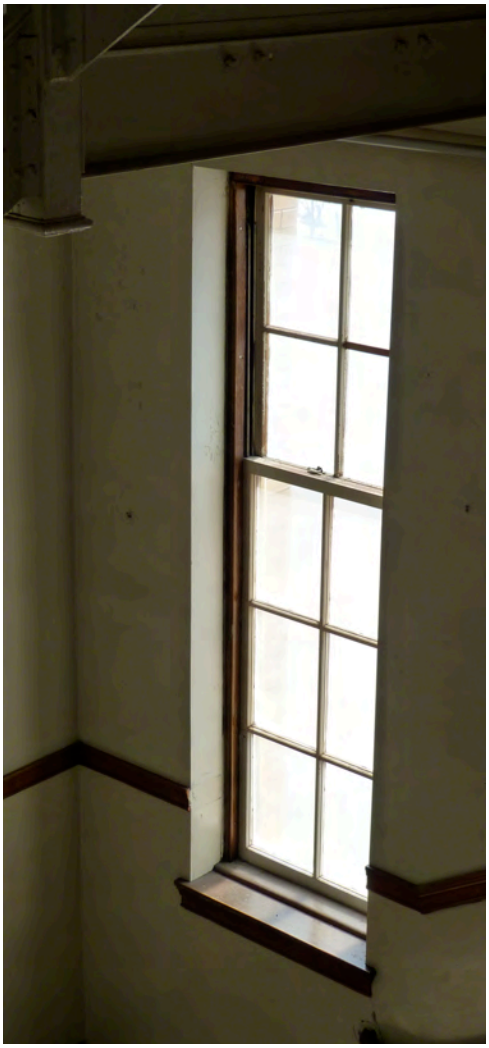
5. WINDOW ASSESSMENT:

Typical wood sill at original double hung windows showing severe weathering

Typical wood window showing sashes and frame to be in repairable condition.

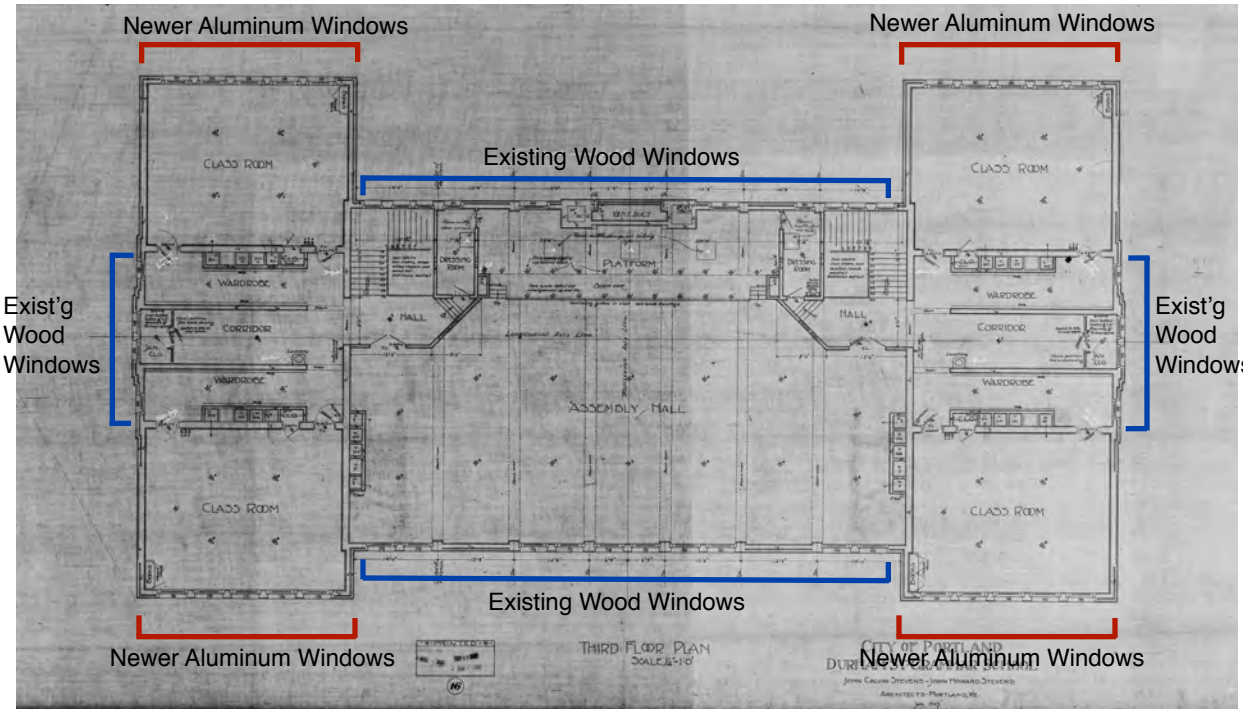
5. WINDOW ASSESSMENT:

Typical replacement aluminum window showing exterior sealant joint

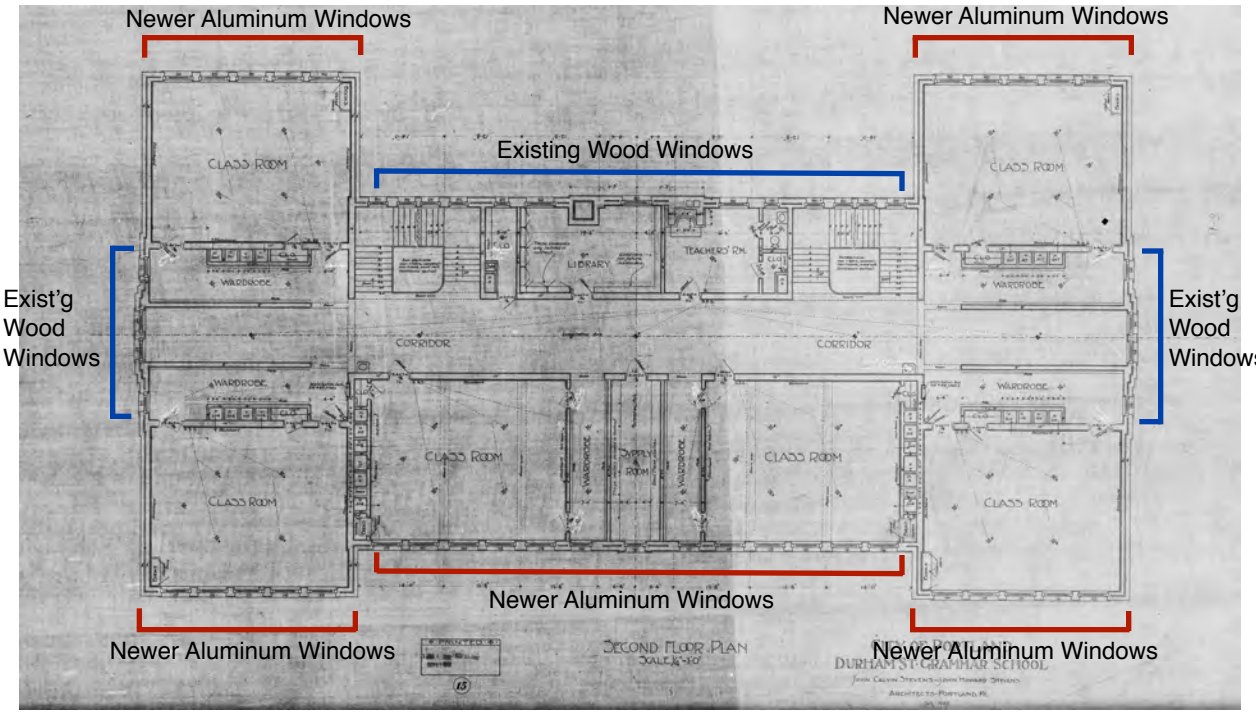


Typical interior of wood window

5. WINDOW ASSESSMENT:

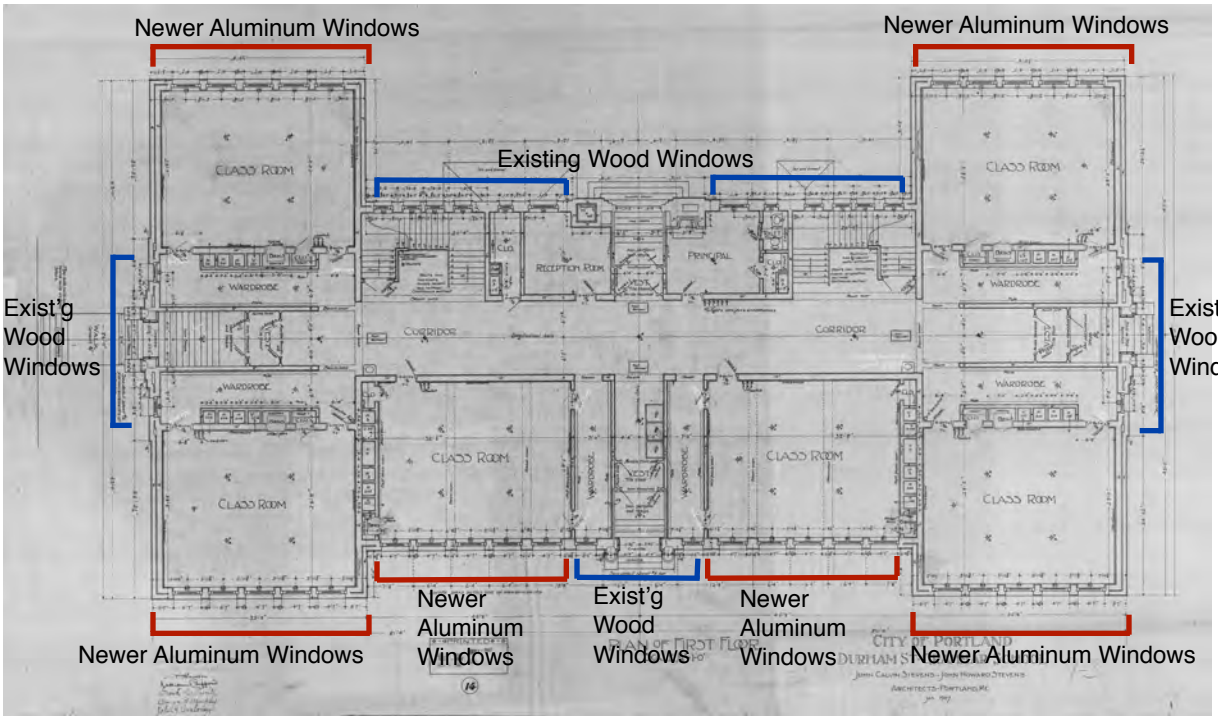


THIRD FLOOR PLAN

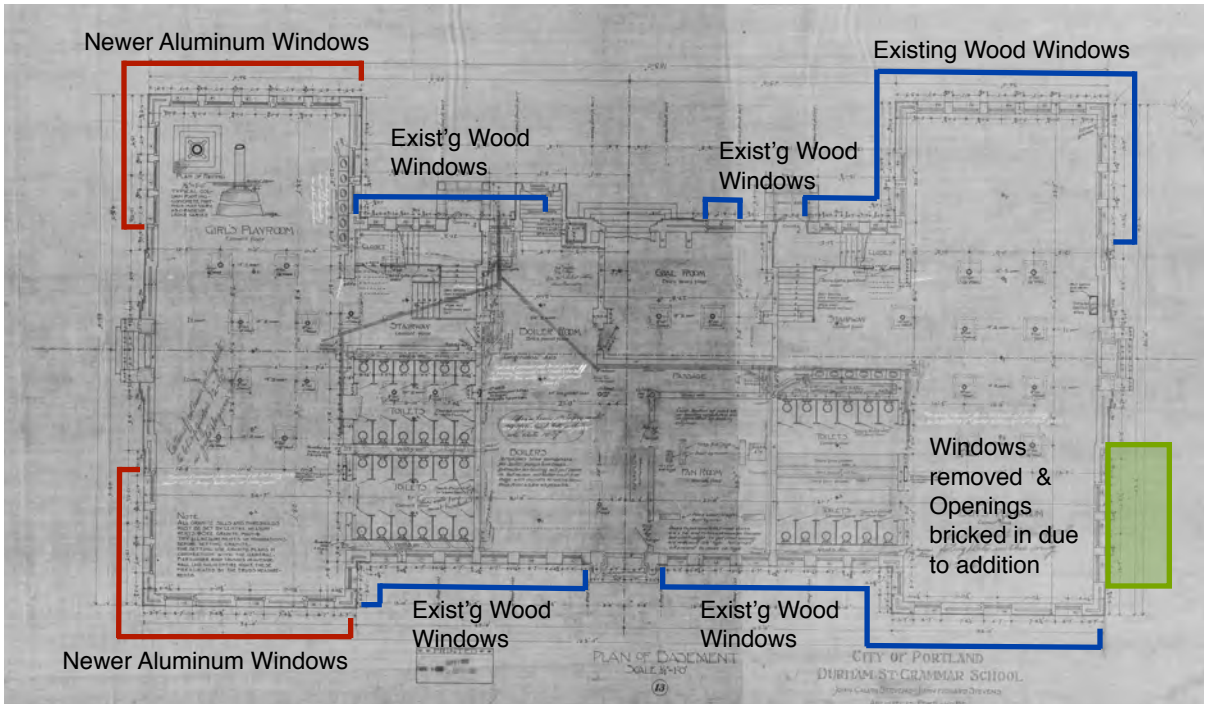


SECOND FLOOR PLAN

5. WINDOW ASSESSMENT:



FIRST FLOOR PLAN

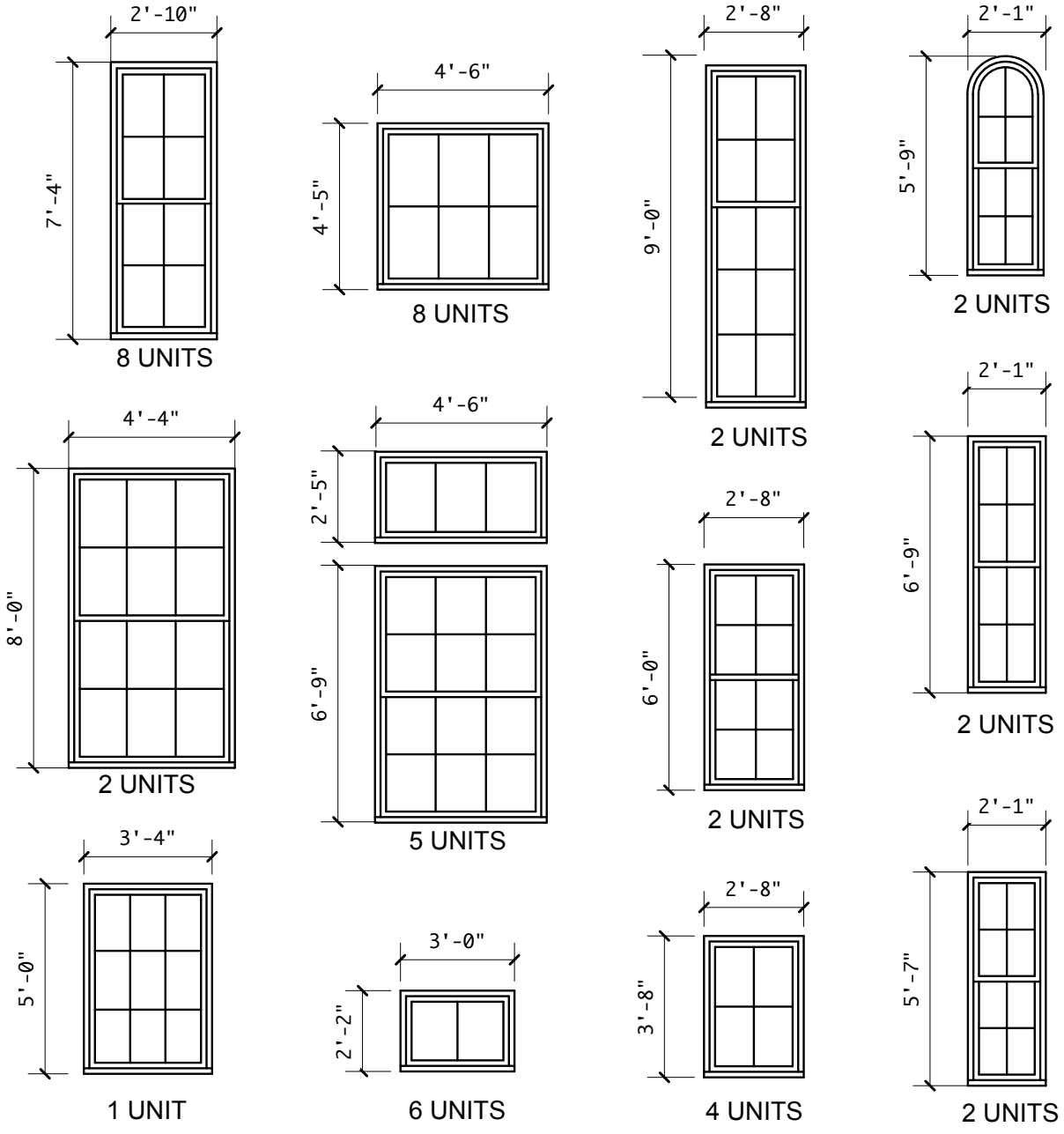


BASEMENT FLOOR PLAN

5. WINDOW ASSESSMENT:

Inventory of Existing Wood Windows: SOUTH FACADE

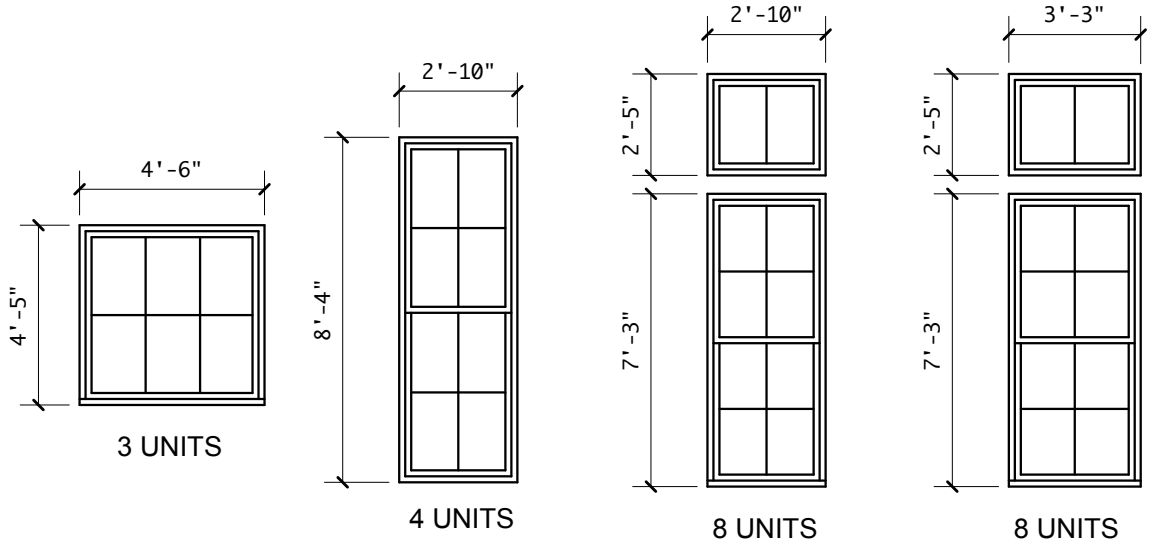
(Window dimensions were traced from existing drawings and are approximate)



5. WINDOW ASSESSMENT:

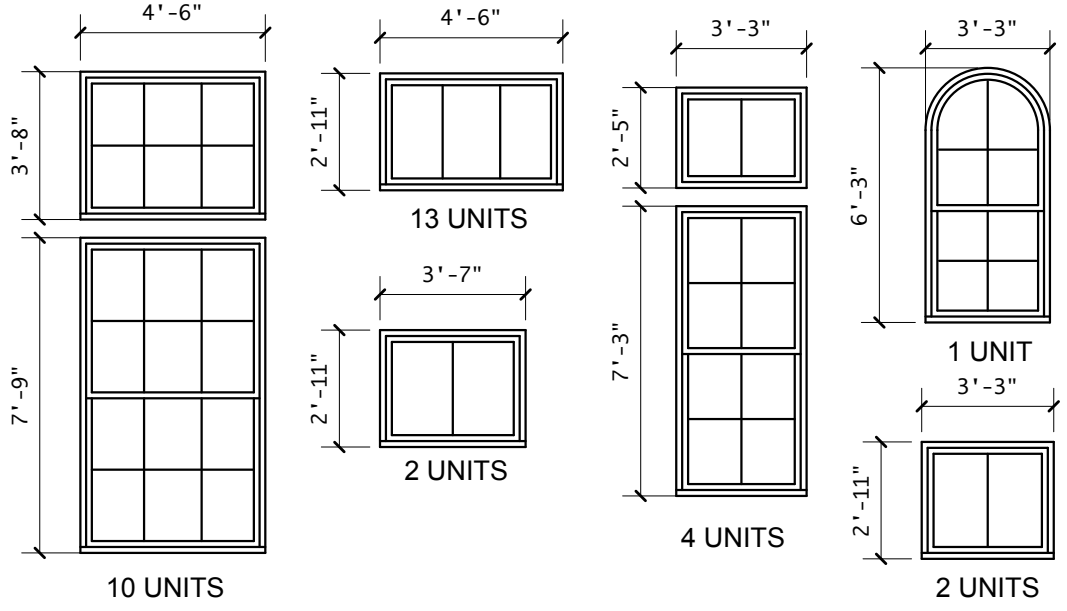
Inventory of Existing Wood Windows: EAST & WEST FACADES

(Window dimensions were traced from existing drawings and are approximate)



Inventory of Existing Wood Windows: NORTH FACADE

(Window dimensions were traced from existing drawings and are approximate)



5. WINDOW ASSESSMENT:

Conclusions:

The newer aluminum replacement windows on the building are in good shape and do not represent a risk to the long term integrity of the building. Re-sealing the joint between the window frame and masonry should be completed within 5 years to assure the weather tightness of the assembly.

The existing wood windows represent more concern in terms of water infiltration between the frames and adjacent masonry and glass panes are loose and falling out in many locations. Missing glass is obviously a direct entry point for water but also for birds and rodents should the building remain unoccupied for a long period of time.

How to address the wood windows is dependent on the developer's proposed financing for re-developing the building. If federal and state historic tax credits are utilized, the remaining existing wood windows will be required to be restored. If the developer does not seek historic tax credits, the treatment of the windows will be reviewed by the Portland Historic Preservation Board for conformance with Portland's Historic Preservation Ordinance. While it is likely the board will strongly encourage restoration, historically accurate replacement windows are an allowable alternative under the ordinance.

In the short term, the windows could be covered over with plywood and sealed in place but there is risk of accelerating deterioration of the existing windows or causing further damage in the process of installing and later removing the panels.

Repair Cost Estimate:

Wood window restoration:.....$136,700.00

Storm Windows:..... $67,200.00

Optional Replacement windows instead of restoration.....$181,000.00

New sealant at aluminum windows:.....$7,900.00

Total Cost of Repair (restoration) + 20% (GC, Contingency, Bonds, OH&P).....$254,160.00

Total Cost of Repair (replacement) + 20% (GC, Contingency, Bonds, OH&P):.....$226,680.00

Priority of Repair:

Second Priority Critical repair that should be completed within 1 year

6. COST SUMMARY:

Repair Item	Estimated Cost	Priority	Complete Within	Notes
Exterior Masonry Wall Repairs	$127,992.00	2	1 Year	
Structural Repairs to Masonry end wall ties & Repairs to exterior entrance Stairs	$164,256.00	2	1 Year	B
Remove existing roofing & install new.060 EPDM membrane over 6" rigid insulation and protection board. Remove abandoned equipment and repair deck as required.	$183,240.00	1	As soon as Possible	
Option 1 - Wood Window Restoration: Restore existing wood window frames in place. Remove wood sash, restore frames and reglaze. repair sash weights and chords, locks and pulls. Install new storm windows at each opening.	$254,160.00	2/3	1 Year/ 5 Years	A
Option 2 - Wood Window Replacement: Remove existing window frames and sash complete. Insulate sash weight pockets and add blocking as required to receive new windows. Install historically accurate replacement windows.	$226,680.00	2/3	1 Year/ 5 Years	A
Total Cost - OPTION 1	$729,648.00			
Total Cost - OPTION 2	$702,168.00			

NOTES:

A. Replacing sealant at previously replaced windows is a Priority 3 repair that should be completed within 5 years.

B. Repairs of the exterior entrance stairs are listed as a Priority 2 based on the premise that they should be repaired before the building is re-occupied for safety reasons. The continued deterioration of the stairs does not pose a significant risk to the integrity of the building in the short run. However, they do pose a safety risk to users as the underlying steel support structure shows evidence of significant deterioration that could lead to failure.