Mays Consulting & Evaluation Services, Inc.

A Professional Consulting & Engineering Organization

BUILDING ENVELOPE ASSESSMENT

COLUMBUS METROPOLITAN LIBRARY

SOUTH HIGH BRANCH

COLUMBUS, OHIO

DECEMBER 12, 2018

MAYS PROJECT # COH44-011

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1.0 ABSTRACT

Mays Consulting and Evaluation Services, Inc., (Mays Consulting) was retained by the Columbus Metropolitan Library (CML) to perform a Building Envelope Assessment (BEA) of the South High Branch Library facility, located at 3540 S. High Street, Columbus, Ohio 43207.

The intent of the BEA is to visually determine general overall conditions of the building envelope components, identify any deficiency items, and provide recommendations for corrective action.

Joey Bartlett performed the BEA for Mays Consulting on December 12, 2018, and has authored this report.

This report is not all-inclusive but describes the conditions observed during the BEA. As described in the findings of this report, there were deficiencies observed in the various building envelope system components that could allow moisture to penetrate the building's interior. Note that the recommendations for corrective actions are typically general and may require additional investigation and/or research for the final repair design.

Supplied elevation drawings were used to identify deficient areas during the BEA. As there was no roof plan view provided, the east and west elevation drawings were used again to identify deficiency areas on the roof(s).

2.0 General Conditions

Walls:

- Wall areas consist of brick and tile. There are also several steel tube columns. The overall condition of these walls and columns was good, with minor needed repairs.
- The ceilings and soffits at overhangs, and at the open walkway structure at front of building are painted gypsum board. These areas are in poor condition, with deterioration, cracking at joints, exposed fasteners, and chipping/flaking paint. These areas should be repaired in the short term.
- Corrosion was observed at the base of several of the steel tube columns and should be addressed in the short term. Paint on the columns is faded and flaking at various locations. Columns should be considered for repainting within the next few years.
- The sealant joint between the steel tube columns and adjoining veneers was found to be cracked/shrunk at various locations.
- The masonry control sealant joint is cracked/shrunk at various locations around the building.
- There is a metal flashing installed at inside corner between windows and masonry wall at north elevation that is attached through the window framing.
- The freestanding wall on east elevation at front entrance has many issues with the masonry mortar joints, such as missing mortar, cracked/shrunk mortar, and failed sealant repairs at the masonry joints.
- There are some non-sealed wall penetrations on the west elevation.
- There is a broken gate hinge on the west elevation.
- There are holes in the steel members where items were removed at the clerestory area at the east elevation.

Windows:

- Windows are all fixed. There are storefront, curtainwall, and clerestory window sets. The overall condition of these windows was good with minor needed repairs. Sealants were noted at the base of several windows at the clerestory area, suggesting there were leaks. The gaskets at these window areas should be checked for weather tightness.

- There are a combined total of 26 different window sets for all wall elevations consisting of approximately 2,739 SF of window area.

	Window Quantity	**Window Size**	**Window Sq. Ft.**
	1	*5'-7" x 7'-9"	43
	1	*5'-9" x 9'-9"	55.4
	1	*5'-9" x 11'-10"	68.6
	1	*5'-6" x 13'-6"	57.1
	1	*30'-0" x 3'-0"	81
	1	*21'-9" x 20'-6"	343.5
	1	5'-0" x 8'-0"	40
	3	28'-0" x 3'-0"	252
	1	3'-10" x 4'-2"	16
	1	3'-6" x 5'-0"	17.5
	1	3'-6" x 6'-9"	23.6
	1	3'-6" x 8'-6"	30
	1	3'-6" x 12'-10"	44.9
	1	6'-0" x 10'-2"	61
	1	6'-0" x 12'-2"	73
	1	6'-0" x 14'-0"	84
	1	2'-8" x 10'-4"	27.5
	1	5'-10" x 10'-4"	60.3
	1	*17'-4" x 15'-4"	240
	1	*6'-10" x 5'-1"	35.2
	1	*45'-8" x 5'-0"	207.2
	1	*110-0" x 5'-0"	558.5
	1	*67-2" x 5'-0"	288.5
	1	3-0" x 10'-6"	31.5
Totals	**26**	*Denotes approximate dimensions	**2739**

- The sealant joints between the windows and various veneers were found to be cracked/shrunk and in poor condition at many locations.
- There is a masonry to window/door frame joint at east elevation that is not sealed.
- Pressure plate on window at north elevation was observed to be damaged.
- Moderate to heavy corrosion was observed at several window lintels.

Doors:

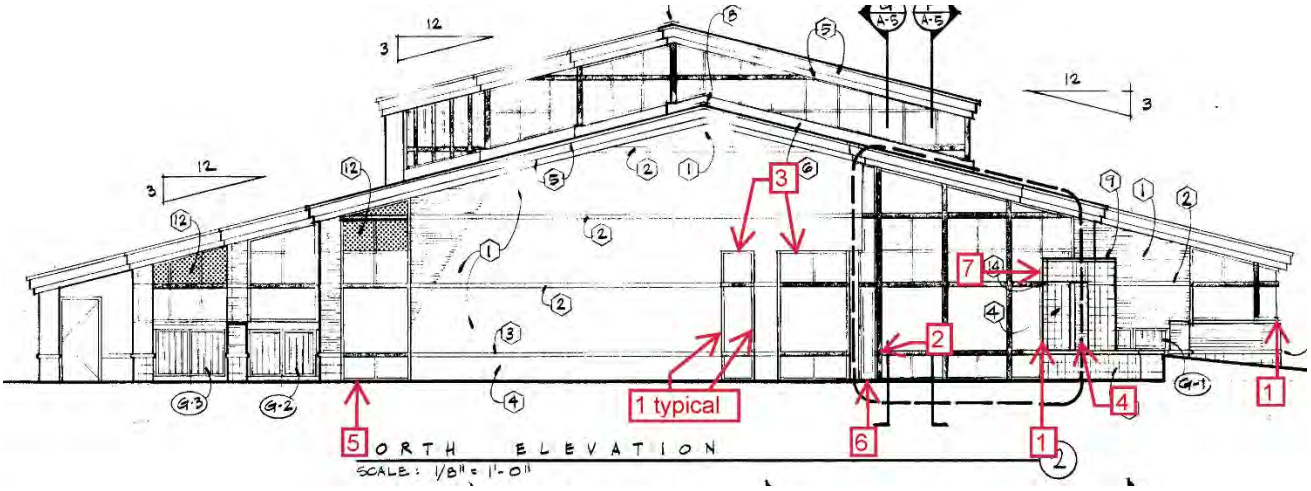
- Doors are singles and doubles. They are constructed of glass. The overall condition of these doors was good.
- The sealant joints at doors to veneer are cracked/shrunk and it poor condition at various locations.

Roofing:

- Roofing system(s) consist of dimensional shingles, and a small fully adhered EPDM roof area at main entrance. With the exception of a section of gutter and downspout on the east elevation, the majority of the roof areas drain off from roof to roof, and from roof to ground. The EPDM roof has one (1) roof drain. The overall condition of the shingles and EPDM roof is good, and with minor repairs they should provide an additional 10+ years of serviceable life.
- The gutter and downspout look to be in overall good condition.
- There is some damaged drip edge at roof eave area.
- There are several areas of damaged, loose, and missing fascia metal around building.
- There is corrosion at the fascia metal to cap/drip metal intersection at the open framing entranceway on the south elevation.
- There are several damaged/deficient shingles that need replaced.
- There is an open flashing on the EPDM roof at the edge-to-wall transition.
- The joints of the headwall metal vent located at clerestory, appear to have been re-sealed, but sealant is missing/loose at many locations.

3.0 Findings and Recommendations

Walls Windows and Doors - North Elevation

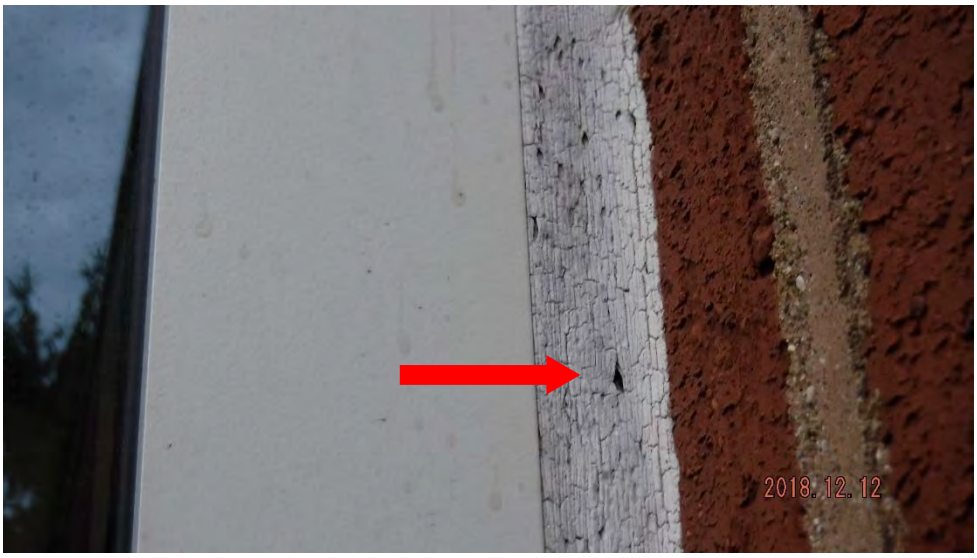


1. **Finding – Window to Veneer Sealant Joints:** The sealant joints between windows and the various veneers was found to be cracking/shrunk and in poor condition at many locations on the building.

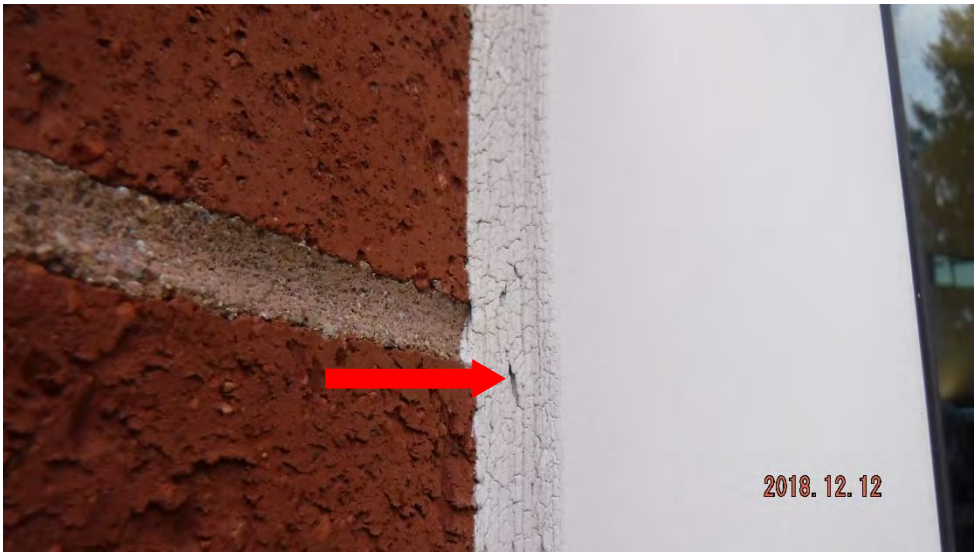
   Recommendation – Window to Veneer Sealant Joints: Remove existing sealant from joints, prep joints, and install new backer rod and sealant as needed.

1a. Cracking/shrunk sealant joints (see #1 on elevation photo for location).

1b. Probe inserted several inches into open space at sealant joint (see #1 on elevation photo for location).



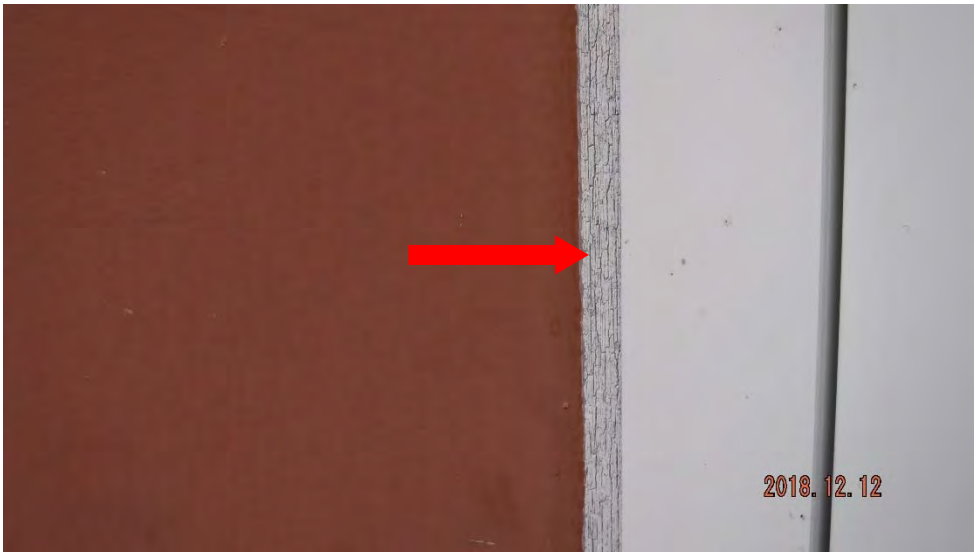
1c. Cracking/shrunk sealant joint (see #1 on elevation photo for typical location).



1d. Cracking/shrunk sealant joint (see #1 on elevation photo for typical location).

2. **Finding – Steel Column to Veneer Joints:** The sealant joints between the steel columns and the adjoining veneers was found to be cracking/shrunk at numerous locations.

   Recommendation – Steel Column to Veneer Joints: Remove existing sealant from joints, prep joints, and install new backer rod and sealant as needed.



2a. Cracked/shrunk sealant joint between steel column and window/door framing (see #2 on elevation photo for location).

3. **Finding – Window Lintels:** The window lintels were found to have moderate to heavy corrosion at several locations on building.

   Recommendation – Window Lintels: Properly prep and clean, then re-paint the lintels.

3a. Corrosion on window lintel (see #3 on elevation photo for location).

3b. Corrosion on window lintel (see #3 on elevation photo for location).

4. **Finding – Masonry Control Sealant Joints:** The masonry control sealant joint(s) are cracking/shrunk at various locations on the building.

   Recommendation – Masonry Control Sealant Joints: Remove existing sealant from joints, prep joints, and install new backer rod and sealant as needed.

4a. Cracked/shrunk masonry control sealant joint (see #4 on elevation photo for location).

5. **Finding – Window Pressure Plate:** There is a window pressure plate that was found to be damaged.

   Recommendation – Window Pressure Plate: Repair or replace the damaged window pressure plate.

5a. Damage to window pressure plate (see #5 on elevation photo for location).

5b. Closer view of damaged pressure plate (see #5 on elevation photo for location).

6. **Finding – Steel Column Corrosion:** The base of the steel column was found to have moderate to heavy corrosion.

   Recommendation – Steel Column Corrosion: Make proper repairs to column and re-paint as needed.

6a. Overview of steel column. See area of corrosion at arrow (see #6 on elevation photo for location).

6b. Corrosion at base of steel column (see #6 on elevation photo for location).

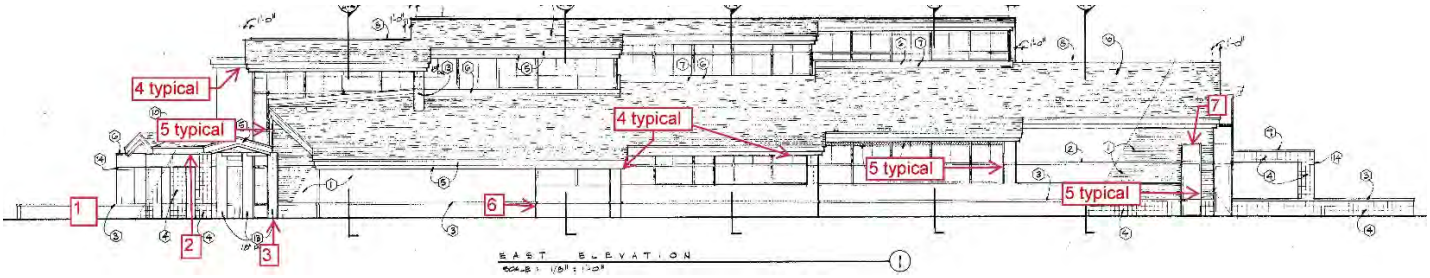
7. **Finding – Metal Flashing:** There is a metal flashing installed at inside corner between windows and masonry wall. It is assumed this piece was installed as water may have been migrating into building at this joint. The metal flashing was through fastened into the window framing.

   Recommendation – Metal Flashing: Remove the flashing and determine area of leakage. Make necessary repairs to the window framing, and seal the areas between the wall and window to alleviate the need for the metal flashing.

7a. Overall of the metal flashing. See fasteners through fastened into window frame (see #7 on elevation photo for location).

7b. Fastener through fastened into window frame (see #7 on elevation photo for location).

Walls Windows and Doors - East Elevation



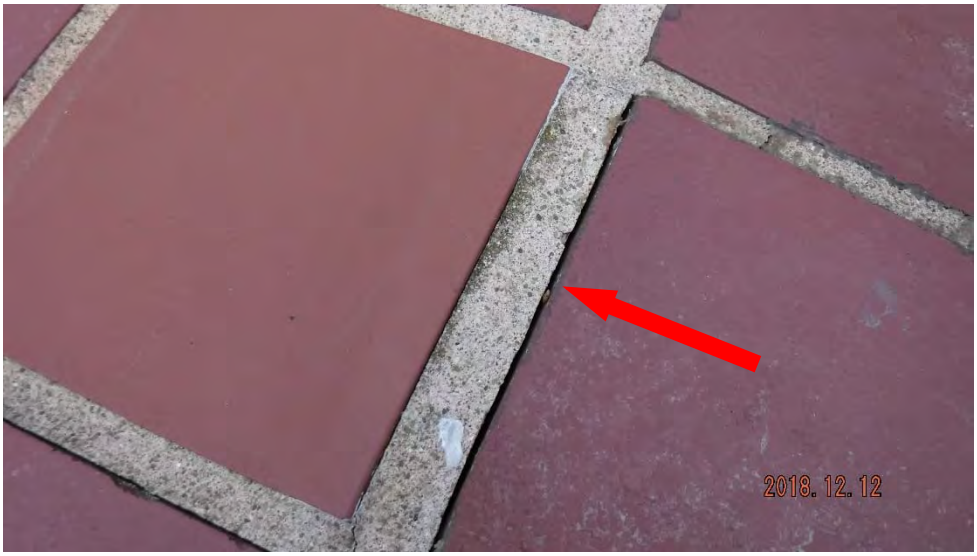
1. **Finding – Freestanding Masonry Wall:** There is a freestanding masonry wall at the main entrance on the east elevation. The wall has missing mortar at masonry joints, cracked/shrunk mortar joints, and several failed sealant repairs at cracked/shrunk mortar joints.

   Recommendation – Freestanding Masonry Wall: Grind out the cracked/shrunk mortar joints, and failed sealant joint repairs. Tuckpoint joints as needed.

1a. Freestanding wall at main entrance (see #1 on elevation photo for typical location).

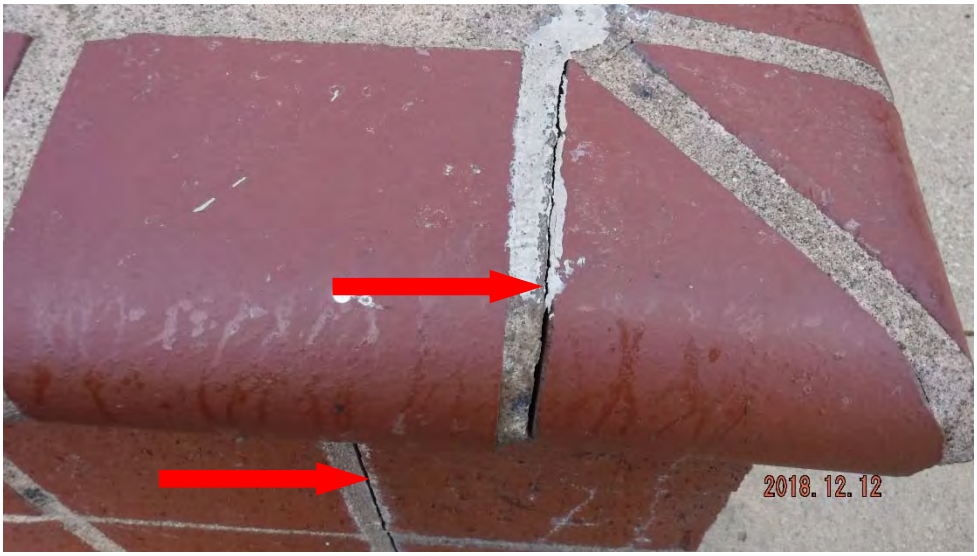
1b. Missing mortar at masonry joint (see #1 on elevation photo for typical location).

1c. Cracked/shrunk mortar joint (see #1 on elevation photo for typical location).



1d. Cracked/shrunk mortar joint(s) (see #1 on elevation photo for typical location).

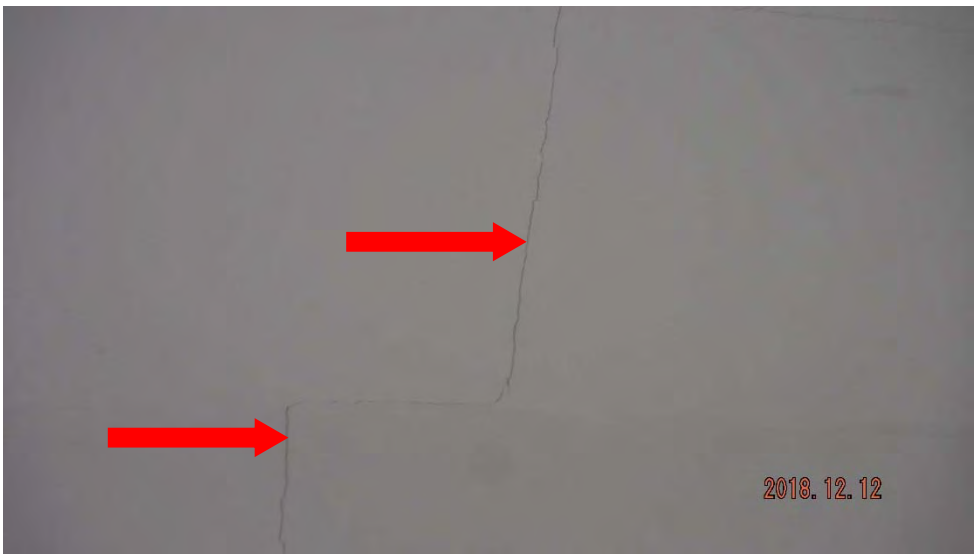
1e. Cracked/shrunk mortar joint(s) (see #1 on elevation photo for typical location).



1f. Cracked/shrunk mortar joints and failed sealant repairs (see #1 on elevation photo for typical location).

2. **Finding – Soffit Ceiling at Open Walkway Structure:** The ceiling area at the open walkway structure leading to main entrance appears to be painted gypsum board. There is a metal flashing between the ceiling and the masonry wall for this structure. The ceiling was found to be in poor condition. There are numerous cracks/splits in the board. Deterioration at the perimeters can be seen. The paint is chipping/flaking off at many areas. The metal flashing between the ceiling and wall is loose or missing at several areas.

   Recommendation – Soffit Ceiling at Open Walkway Structure: Replace or repair the gypsum board, then prep and re-paint as needed. Re-secure the metal flashing if possible, or replace with new as needed.



2a. Cracks in soffit ceiling (see #2 on elevation photo for typical location).

2b. Cracks in soffit ceiling (see #2 on elevation photo for typical location).

2c. Deterioration of soffit ceiling and chipping/flaking paint (see #2 on elevation photo for typical location).

2d. Deterioration of soffit ceiling and chipping/flaking paint (see #2 on elevation photo for typical location).

2e. Deterioration of soffit ceiling and chipping/flaking paint (see #2 on elevation photo for typical location).

2f. Deterioration of soffit ceiling and chipping/flaking paint (see #2 on elevation photo for typical location).

2g. Deterioration of soffit ceiling and chipping/flaking paint (see #2 on elevation photo for typical location).

2h. Loose metal flashing (see #2 on elevation photo for typical location).

2i. Loose fasteners for metal flashing (see #2 on elevation photo for typical location).

2j. Missing metal flashing (see #2 on elevation photo for typical location).

3. **Finding – Steel Column Corrosion:** The base of the steel columns was found to have moderate to heavy (severe) corrosion.

   Recommendation – Steel Column Corrosion: Make proper repairs to columns and re-paint as needed.

3a. Corrosion at base of steel column (see #3 on elevation photo for location).

3b. Corrosion at base of steel column (see #3 on elevation photo for location).

3c. Corrosion at base of steel column (see #3 on elevation photo for location).

3d. Severe corrosion at base of steel column (see #3 on elevation photo for location).

4. **Finding – Overhang Soffit:** The overhang soffits around the building are in disrepair. There is deterioration, exposed fasteners, cracked joints, and chipping/flaking paint.

   Recommendation – Overhang Soffit: Repair or replace deteriorated areas, fix cracked joints, properly prepare all surfaces and then re-paint.

4a. Disrepair of soffit and chipping/flaking paint (see #4 on elevation photo for typical location).

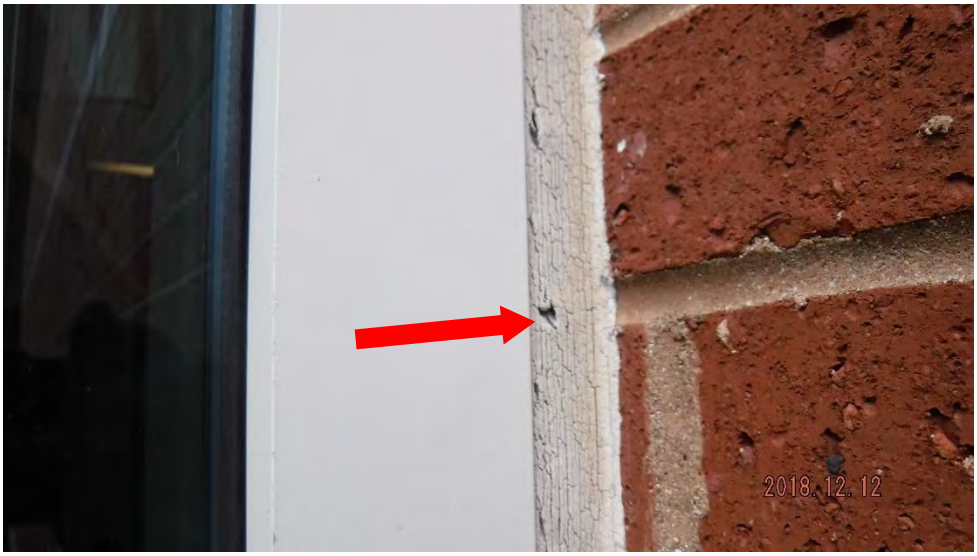
4b. Exposed fasteners and cracked joint (see #4 on elevation photo for typical location).

4c. Crack in soffit (see #4 on elevation photo for typical location).

4d. Cracked joint, delaminating tape, and chipping/flaking paint (see #4 on elevation photo for typical location).

5. **Finding – Window to Veneer Sealant Joints:** The sealant joints between windows and the various veneers was found to be cracking/shrunk and in poor condition at many locations on the building.

   Recommendation – Window to Veneer Sealant Joints: Remove existing sealant from joints, prep joints, and install new backer rod and sealant as needed.



5a. Cracking/shrunk sealant joint (see #5 on elevation photo for typical location).

5b. Cracking/shrunk sealant joint (see #5 on elevation photo for typical location).

5c. Cracking/shrunk sealant joint (see #5 on elevation photo for typical location).

5d. Cracking/shrunk sealant joint (see #5 on elevation photo for typical location).

6. **Finding – Gap at Masonry to Window/Door Frame:** There is a gap between the masonry wall and the window/door framing that was never sealed.

   Recommendation – Gap at Masonry to Window/Door Frame: Prep the joint and install backer rod and sealant as needed.

6a. Gap between masonry and window/door frame (see #6 on elevation photo for location).

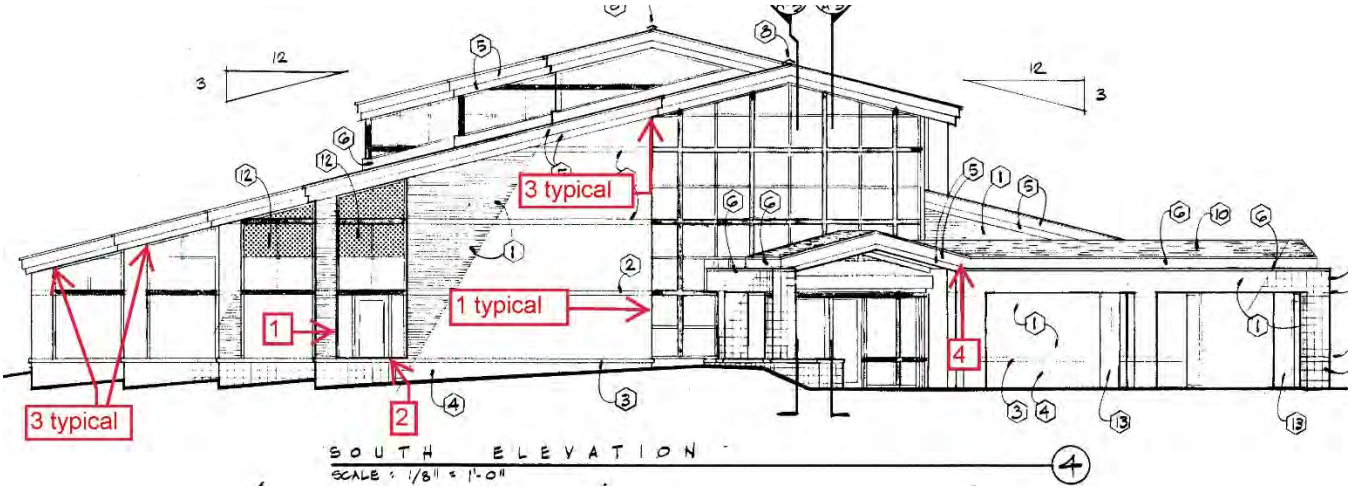
6b. Gap between masonry and window/door frame (see #6 on elevation photo for location).

7. **Finding – Window Lintels:** The window lintels were found to have moderate to heavy corrosion at several locations on building.

   Recommendation – Window Lintels: Properly prep and clean, then re-paint the lintels.

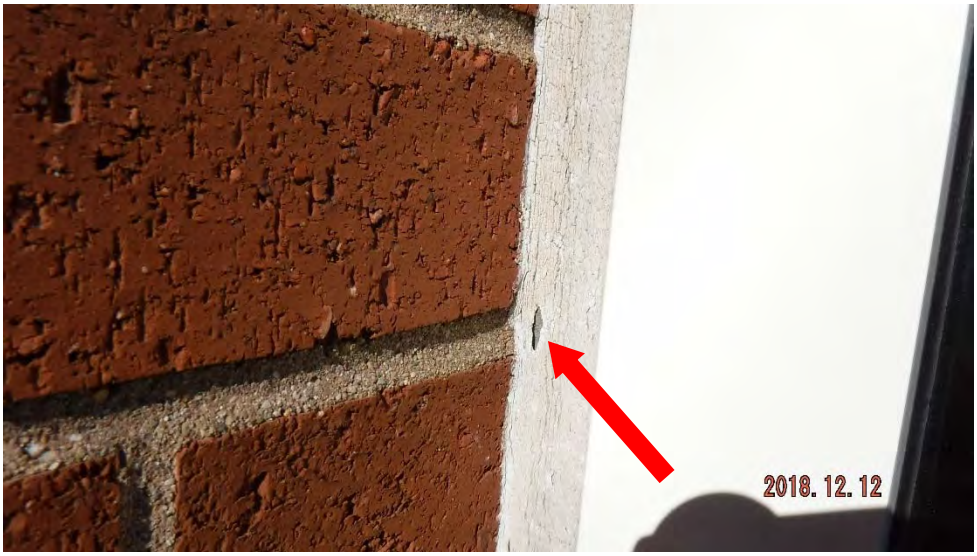
7a. Corrosion on window lintel (see #7 on elevation photo for location).

Walls Windows and Doors - South Elevation

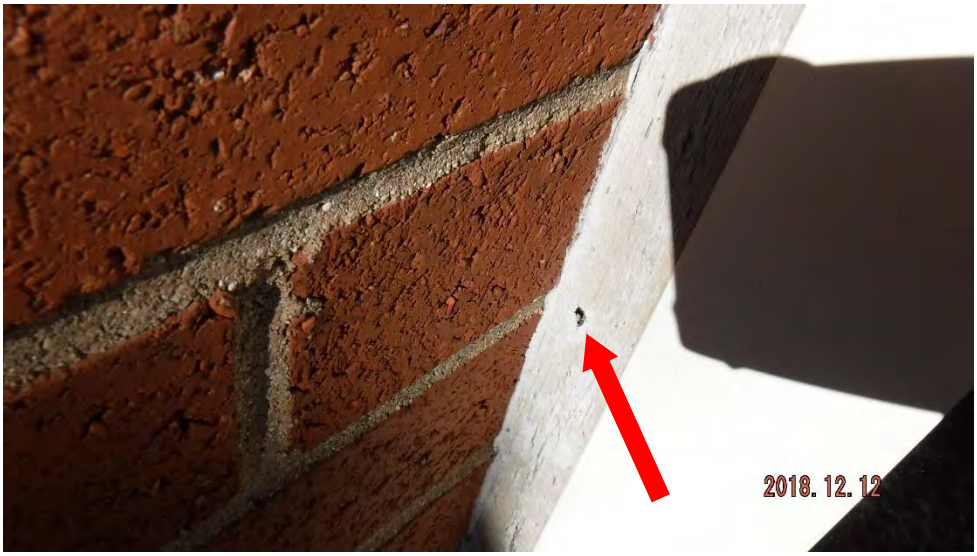


1. **Finding – Window to Veneer Sealant Joints:** The sealant joints between windows and the various veneers was found to be cracking/shrunk and in poor condition at many locations on the building.

   Recommendation – Window to Veneer Sealant Joints: Remove existing sealant from joints, prep joints, and install new backer rod and sealant as needed.



1a. Cracking/shrunk sealant joint. Exposed backer rod visible (see #1 on elevation photo for typical location).



1b. Cracking/shrunk sealant joint (see #1 on elevation photo for typical location).

1c. Cracking/shrunk sealant joint (see #1 on elevation photo for typical location).

2. **Finding – Door to Veneer Sealant Joints:** The sealant joints between doors and the veneer was found to be cracking/shrunk and in poor condition at locations around the building.

   Recommendation – Door to Veneer Sealant Joints: Remove existing sealant from joints, prep joints, and install new backer rod and sealant as needed.

2a. Cracked/shrunk sealant joint (see #2 on elevation photo for location).

2b. Cracked/shrunk sealant joint (see #2 on elevation photo for location).

3. **Finding – Overhang Soffit:** The overhang soffits around the building are in disrepair. There is deterioration, exposed fasteners, cracked joints, and chipping/flaking paint.

   Recommendation – Overhang Soffit: Repair or replace deteriorated areas, fix cracked joints, properly prepare all surfaces and then re-paint.

3a. Disrepair of soffit and chipping/flaking paint (see #3 on elevation photo for typical location).

3b. Disrepair of soffit and chipping/flaking paint (see #3 on elevation photo for typical location).

3c. Disrepair of soffit and chipping/flaking paint (see #3 on elevation photo for typical location).

3d. Disrepair of soffit and chipping/flaking paint (see #3 on elevation photo for typical location).

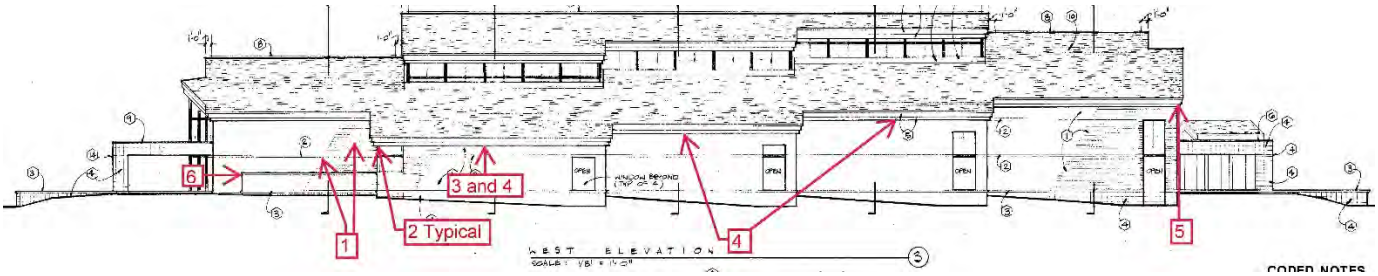
4. **Finding – Fascia and Cap/Drip Metal:** At the open walkway framing located outside of front entrance to library, there is a piece of loose fascia metal and some corroded cap/drip metal directly below the loose fascia metal.

   Recommendation – Fascia and Cap/Drip Metal: Re-fasten the loose fascia metal and replace or remediate the corroded cap/drip metal.

4a. Loose fascia metal and corrosion on cap/drip metal (see #4 on elevation photo for location).

4b. Loose fascia metal and corrosion on cap/drip metal (see #4 on elevation photo for location).

Walls Windows and Doors - West Elevation



1. **Finding – Wall Penetrations:** There are some penetrations protruding through the masonry veneer that are not sealed.

   Recommendation – Wall Penetrations: Prep the joint between the protrusion and the veneer, then install backer rod and sealant as needed.

1a. Open joint between penetration and veneer (see #1 on elevation photo for location).

1b. Open joint between penetration and veneer (see #1 on elevation photo for location).

2. **Finding – Overhang Soffit:** The overhang soffits around the building are in disrepair. There is deterioration, exposed fasteners, cracked joints, and chipping/flaking paint.

   Recommendation – Overhang Soffit: Repair or replace deteriorated areas, fix cracked joints, properly prepare all surfaces and then re-paint.

2a. Disrepair of soffit and chipping/flaking paint (see #2 on elevation photo for typical location).

2b. Chipping/flaking paint (see #2 on elevation photo for typical location).

3. **Finding – Drip Edge Metal:** There is a section of drip edge that has been damaged, or has become distorted, and is not properly lapping over the fascia metal.

   Recommendation – Drip Edge Metal: Make necessary repairs to drip edge so it will work as intended, or replace drip edge if needed.

3a. Damaged or distorted drip edge metal (see #3 on elevation photo for location).

3b. Drip edge metal not lapping over fascia metal as required (see #3 on elevation photo for location).

4. **Finding – Fascia Metal:** There are several sections of loose fascia metal located around the building.

Recommendation – Fascia Metal: Re-secure the fascia metal or replace if needed.

4a. Unsecured/loose fascia metal (see #4 on elevation photo for location).

4b. Unsecured/loose fascia metal (see #4 on elevation photo for location).

4c. Unsecured/loose fascia metal (see #4 on elevation photo for location).

5. **Finding – Fascia Metal:** There is a section of missing fascia metal. The wood fascia member is exposed in this area at present.

   Recommendation – Fascia Metal: Install new section of fascia metal.

5a. Overview of area where fascia metal is missing (see #5 on elevation photo for location).

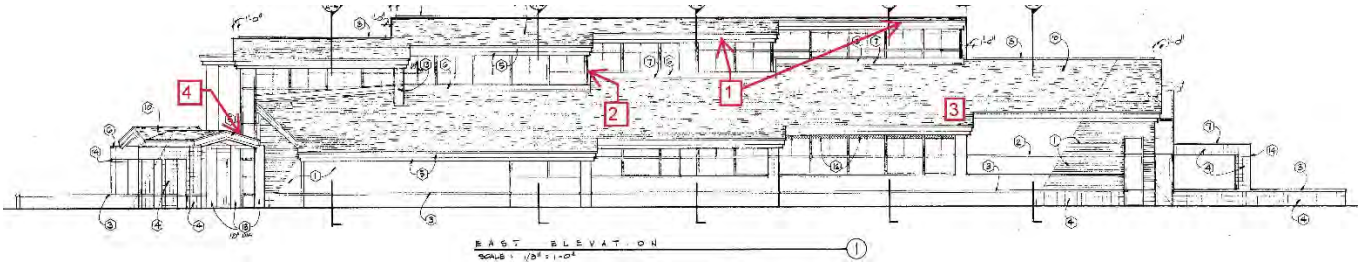
5b. Exposed wood member where fascia metal is missing (see #5 on elevation photo for location).

6. **Finding – Gate Hinge:** There is a broken/missing gate hinge for gate where HVAC equipment is stored.

   Recommendation – Gate Hinge: Install new hinge for gate.

6a. Broken gate hinge (see #6 on elevation photo for location)

Roofing – East Elevation Plan View



1. **Finding – Fascia Metal:** The fascia metal above clerestory windows is damaged at areas.

   Recommendation – Fascia Metal: Replace the damaged fascia metal where needed.

1a. Damaged fascia metal (see #1 on plan view for location).

1b. Damaged fascia metal (see #1 on plan view for location).

2. **Finding – Steel Members at Clerestory:** There are some steel members located at clerestory area where items had been removed and left open holes in the steel tubing.

   Recommendation – Steel Members at Clerestory: Seal the holes to prevent water from migrating into the steel tubing.

2a. Hole in steel member where item was removed (see #2 on plan view for location).

2b. Hole in steel member where item was removed (see #2 on plan view for location).

3. **Finding – Shingles:** There were several damaged shingles found at lower roof area close to eave. There is a tree located close to this same area. It is thought that a limb from the tree had probably dropped on roof in this area at some point and caused the damage.

   Recommendation – Shingles: Replace damaged shingles. Cut tree branches back to prevent limbs from falling onto roof in the future.

3a. Damaged shingle area (see #3 on plan view for location).

3b. Damaged shingles (see #3 on plan view for location).

3c. Multiple damaged shingles (see #3 on plan view for location).

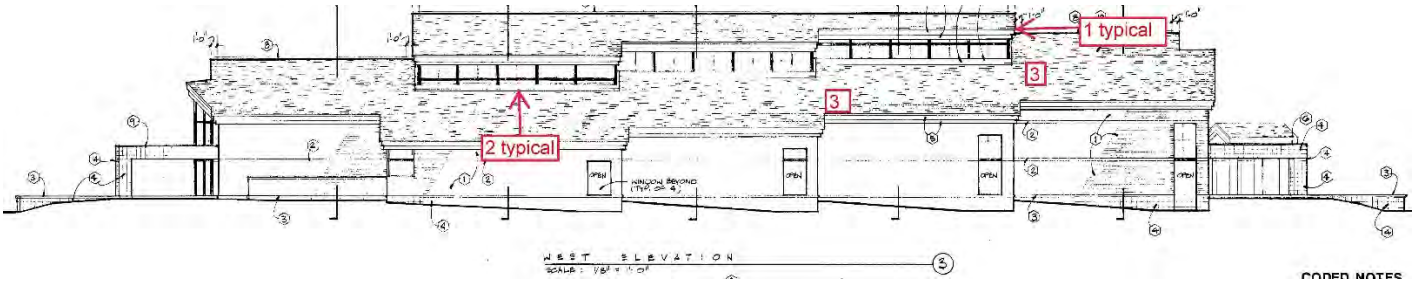
3d. Damaged shingles (see #3 on plan view for location).

4. **Finding – EPDM Roof Flashing:** There is an open flashing on the EPDM roof where the roof edge and the wall come together.

   Recommendation – EPDM Roof Flashing: Patch the open flashing to get roof watertight.

4a. Open flashing at roof edge to wall (see #4 on plan view for approximate location).

Roofing – West Elevation Plan View



1. **Finding – Overhang Soffit:** The overhang soffits at the clerestory are in disrepair. There is deterioration, exposed fasteners, cracked joints, and chipping/flaking paint.

   Recommendation – Overhang Soffit: Repair or replace deteriorated areas, fix cracked joints, properly prepare all surfaces and then re-paint.

1a. Exposed fastener and chipping/flaking paint (see #1 on elevation photo for typical location).

1b. Chipping/flaking paint (see #1 on elevation photo for typical location).

1c. Chipping/flaking paint (see #1 on elevation photo for typical location).

2. **Finding – Headwall Vent:** The headwall vent at base of clerestory windows has had sealant repairs in the past at the joints of the vent. Many of these sealant repairs have since peeled off or cracked exposing the joints.

   Recommendation – Headwall Vent: Properly clean the joints of the headwall vent, prep and re-seal the joints as needed.

2a. Overview of headwall vent at clerestory (see #2 on plan view for location).

2b. Missing sealant at the vent joint (see #2 on plan view for typical location).

2c. Cracking of the sealant at the vent joint (see #2 on plan view for typical location).

2d. Cracking of the sealant at the vent joint (see #2 on plan view for typical location).

3. **Finding – Shingles:** There appears to be some deficiencies in the roof shingles at some areas. The granules are missing and fabric within the shingles is exposed.

Recommendation – Shingles: Replace the deficient shingles as needed.

3a. Exposed fabric in deficient shingles (see #3 on plan view for typical locations).

3b. Exposed fabric in deficient shingle (see #3 on plan view for typical locations).

END OF REPORT