LAKETOWN TOWNSHIP BUILDING AUTHORITY

THE FELT ESTATE

6597 138TH AVE.

HOLLAND, MI 49423

(616) 335-3050

AGENDA

MONDAY, NOVEMBER 24, 2025

SPECIAL MEETING

4 P.M.

I. CALL TO ORDER

II. APPROVAL OF MINUTES NOV. 6, 2025

III. OLD BUSINESS

   a. Felt Mansion

IV. NEW BUSINESS

V. PUBLIC COMMENT

VI. ADJOURN

PROPOSED MINUTES
LAKETOWN TOWNSHIP BUILDING AUTHORITY
4338 BEELINE ROAD
HOLLAND, MI 49423
(616) 335-3050
November 6, 2025

I. CALL TO ORDER

Lynn Kobes called the Building Authority to order at 10:05 a.m. at the township hall.
MEMBERS PRESENT: Stephanie Fox, Lynn Kobes, Robert Schaftenaar, James Johnson (ex-officio)
MEMBERS ABSENT: James Delaney (ex-officio)
ALSO PRESENT: Steven Ringelberg, Supervisor

Motion by Kobes, second by Fox, to appoint Schaftenaar chairperson of the Laketown Township Building Authority. MOTION UNANIMOUSLY APPROVED 3-0 VOICE VOTE.

II. APPROVAL OF MINUTES JULY 28, 2025

Motion by Kobes, second by Schaftenaar, to approve the minutes of the July 28, 2025, meeting of the Building Authority. Schaftenaar called for a vote. MOTION UNANIMOUSLY APPROVED 3-0 VOICE VOTE.

III. OLD BUSINESS

a. Wolters Property

At the request of the Building Authority, Ringelberg explained the history of the Wolter's Property and the Township's ownership of the property, as well as the Board of Trustees current thinking on the Wolter's property.

Authority members discussed the history and other aspects of the Wolters House, its purchase, how the mortgage is paid, and possible options for its use including a township building for grounds and maintenance and the parks commission.

They noted the Laketown Township Planning Commission on Nov. 5, 2025, recommended changing the property zoning from R-1 to R-2, to be sent to the township board in December for action.

Members said a school is the best option for a property owner if the property is sold.

Authority members will be sent background documents by the public information coordinator describing the history of the site.

b. Felt Mansion

At the request of the Building Authority, Ringelberg explained some of the structural issues at the mansion and the costs of repairs as estimated by E&V. He recommended that the building authority meet with Felt Estate Executive Director Elizabeth McEwen and E&V at the mansion for a better understanding of the issues. Nov. 24 is a possible meeting time. The public information coordinator will contact McEwen to set specifics.

IV. NEW BUSINESS
None

V. PUBLIC COMMENT
Start: 11 a.m.
No comments. No public present
Finish: 11 a.m.

Authority members continued discussion about the Felt Mansion.

VI. ADJOURN
Motion by Kobes, second by Fox, to adjourn the meeting at 11:30 a.m. Schaftenaar called for a vote. MOTION UNANIMOUSLY APPROVED 3-0 VOICE VOTE.

Version 1

FELT MANSION

Limited Building Enclosure Assessment

6597 138TH AVENUE, HOLLAND MI 49423

2/1/2025

Description			Area (sf) or Unit	Direct Construction Cost			Soft Costs / Owner Direct / Contingency (25%)			Total Costs		
				Low	Medium	High	Low	Medium	High	Low	Medium	High
Priority	**ELEVATION**	**A- EXTERIOR WALLS MAIN HOUSE**										
High	ALL	2 TO 5 YEAR RECOMMENDATION- Repointing the exterior brick weathered mortar joints	1,527SF	$106,900	$111,176	$115,452	$26,725	$27,794	$28,863	$133,625	$138,970	$144,315
High	*North*	*See Localized Repointing SF in interactive pdf*	*163SF*									
High	*West*	*See Localized Repointing SF in interactive pdf*	*1,331SF*									
High	*Low West*	*See Localized Repointing SF in interactive pdf- with Low west pricing Item 7*										
High	*South*	*See Localized Repointing SF in interactive pdf*	*No Work*									
High	*East*	*See Localized Repointing SF in interactive pdf*	*33SF*									
Medium		Repointing Mis-Matched Mortar- NOT PRICED	N/A									
		Subtotal		**$106,900**	**$111,176**	**$115,452**	**$26,725**	**$27,794**	**$28,863**	**$133,625**	**$138,970**	**$144,315**
Priority	**ELEVATION**	**B-STEEL WINDOWS AND DOOR LINTLES**										
Low		10 + years- clean and refurbish or replace steel lintels										
		Not Priced										
Priority	**ELEVATION**	**C- WINDOWS AND DOORS**										
High		2-5 year Recommendation; Test window paint and caulking for LBP and perform abatement as necessary -	1 LS	$1,500	$1,560	$1,620	$375	$390	$405	$1,875	$1,950	$2,025

Description			Area (sf) or Unit	Direct Construction Cost			Soft Costs / Owner Direct / Contingency (25%)			Total Costs		
				Low	Medium	High	Low	Medium	High	Low	Medium	High
High		Strip Existing paint from exterior windows sashes, frames and repaint all surfaces- Includes sashes being removed- Need qualified abatement contractor for this work (EV Comment- Paint is thick and could lead to destruction to the aging windows when trying to scrape sand and clean prior to painting) - This pricing assumes abatement.	1LS	$274,300	$285,272	$296,244	$68,575	$71,318	$74,061	$342,875	$356,590	$370,305
High	*North*	*See Paint SF at Windows in interactive PDF*	*96SF*									
High	*West*	*See Paint SF at Windows in interactive PDF*	*600SF*									
High	*South*	*See Paint SF at Windows in interactive PDF*	*45SF*									
High	*East*	*See Paint SF at Windows in interactive PDF*	*486SF*									
		Subtotal		**$275,800**	**$286,832**	**$297,864**	**$68,950**	**$71,708**	**$74,466**	**$344,750**	**$358,540**	**$372,330**

Description	Area (sf) or Unit	Direct Construction Cost			Soft Costs / Owner Direct / Contingency (25%)			Total Costs		
		Low	Medium	High	Low	Medium	High	Low	Medium	High
Priority **ELEVATION** **D- ROOFING, EVES,CORNICES**										
High	2-5 year Recommendation; Test facia paint and caulking for LBP and perform abatement as necessary -	1LS	$1,500	$1,560	$1,620	$375	$390	$405	$1,875	$1,950	$2,025
High	Replace boards in kind where noted and repaint	1AL	$5,000	$5,200	$5,400	$1,250	$1,300	$1,350	$6,250	$6,500	$6,750
High	Strip Existing paint from exterior facia repaint all surfaces- Need qualified abatement contractor for this work. This pricing assumes abatement	1LS	$295,000	$306,800	$318,600	$73,750	$76,700	$79,650	$368,750	$383,500	$398,250
High	*North* *See Paint SF at Facia in interactive PDF*	*932SF*									
High	*West* *See Paint SF at Facia in interactive PDF- Dormers Only*	*50 SF*									
High	*South* *See Paint SF at Facia in interactive PDF*	*932 SF*									
High	*East* *See Paint SF at Facia in interactive PDF- inc Dormers*	*528 SF*									
	Subtotal		**$301,500**	**$313,560**	**$325,620**	**$75,375**	**$78,390**	**$81,405**	**$376,875**	**$391,950**	**$407,025**
Priority **ELEVATION** **E- GUTTERS AND DOWNSPOUTS**										
High	ALL Perform localized resealing and repairs to gutter and downspouts ends and corners to address water leakage.	Included Below									
	Replace damaged sections of downspouts in kind and reconnect to the below-grade leaders. Complete this work in conjunction with repointing to protect new work	1LS	$9,900	$10,296	$10,692	$2,475	$2,574	$2,673	$12,375	$12,870	$13,365
	Subtotal		**$9,900**	**$10,296**	**$10,692**	**$2,475**	**$2,574**	**$2,673**	**$12,375**	**$12,870**	**$13,365**
Priority **ELEVATION** **F- FRONT PORTICO**										
Immediate	barricaded from access and visitors and staff redirected to another entrance until the overhead hazards can be addressed.	1SF									

Description			Area (sf) or Unit	Direct Construction Cost			Soft Costs / Owner Direct / Contingency (25%)			Total Costs		
				Low	Medium	High	Low	Medium	High	Low	Medium	High
Immediate		Remove all remaining loose and deteriorated railing stone units and loose stone units sitting on the portico roof. (This is short term solution and may not be aesthetically pleasing)	1LS	$5,700	$5,928	$6,156	$1,425	$1,482	$1,539	$7,125	$7,410	$7,695
High		Consult a Structural Engineer for structural analysis for restoration as noted and recommended	1LS				NA	NA	NA	$0	$0	$0
		Subtotal		**$5,700**	**$5,928**	**$6,156**	**$1,425**	**$1,482**	**$1,539**	**$7,125**	**$7,410**	**$7,695**

Description			Area (sf) or Unit	Direct Construction Cost			Soft Costs / Owner Direct / Contingency (25%)			Total Costs		
				Low	Medium	High	Low	Medium	High	Low	Medium	High
Priority	**ELEVATION**	**G- WEST VESTIBULE w Upper Terrace Roof**										
Immediate	West	Remove all remaining loose and deteriorated railing stone units and loose stone units sitting on the vestibule roof.	Included Below									
High	West	Consult with a structural engineer and install temporary stabilization of the brick masonry wall above the lintels.	Included Below									
High	West	Reconstruction noted- Remove and reinstall salvaged and install new as required limestone balustrades , remove exterior face brick down to steel lintel- , clean as required reinstall new steel lintels and flashing0 reinstall salvaged brick, reroof and reinstall balustrade railings as outlined in recommendations	1LS	$66,280	$68,931	$71,582	$16,570	$17,233	$17,896	$82,850	$86,164	$89,478
		New copper flashings and roofing	1LS	$9,000	$9,360	$9,720	$2,250	$2,340	$2,430	$11,250	$11,700	$12,150
		Interior Restoration and Repair as needed	1AL	$35,000	$36,400	$37,800	$8,750	$9,100	$9,450	$43,750	$45,500	$47,250
		Subtotal		**$110,280**	**$114,691**	**$119,102**	**$27,570**	**$28,673**	**$29,776**	**$137,850**	**$143,364**	**$148,878**
Priority	**ELEVATION**	**H- WEST TERRACE WATERPROOFING- WEST TERRACE RAILINGS- WEST TERRACE LOWER WALLS**										
High	West	The West Terrace waterproofing has exceeded its useful service life	1,200SF									
High	West	In order to address the West Terrace Waterproofing -Remove Limestone Balustrades, salvage all materials of reinstall possible- assume a 50% new qty of limestone balustrades.- Once deck has been restored- Reinstall balustrade system.	Included Below									
High	West	Remove paver system down to coal tar, consider encapsulating with new waterproofing and reconstruction the deck- slope pavers and sand layer to drains and scuppers.	Included Below									
High	West	Perform repairs to the concrete deck, including epoxy crack injection and concrete patch repairs.	Included Below									

Description			Area (sf) or Unit	Direct Construction Cost			Soft Costs / Owner Direct / Contingency (25%)			Total Costs		
				Low	Medium	High	Low	Medium	High	Low	Medium	High
High	West	West Terrace Lower Walls: Lower Partially deconstruct and reconstruct the stone and brick masonry around the basement door to correct out of plane movement.	Included Below									
High	West	Remove existing door Frame and door- replace with new- Size and customer	Included Below									
High	West	Remove all sealant at all joints. Fully repoint all brick and stone joints with Type N mortar.	1LS	$21,000	$21,840	$22,680	$5,250	$5,460	$5,670	$26,250	$27,300	$28,350
	West	See interactive PDF for QTY;s	1LS	$301,000	$313,040	$325,080	$75,250	$78,260	$81,270	$376,250	$391,300	$406,350
	West	20% allowance for limestone tops and bottoms and other replacements	1AL	$60,200	$62,608	$65,016	$15,050	$15,652	$16,254	$75,250	$78,260	$81,270
		Subtotal		**$382,200**	**$397,488**	**$412,776**	**$95,550**	**$99,372**	**$103,194**	**$477,750**	**$496,860**	**$515,970**

Description			Area (sf) or Unit	Direct Construction Cost			Soft Costs / Owner Direct / Contingency (25%)			Total Costs		
				Low	Medium	High	Low	Medium	High	Low	Medium	High
Priority	**ELEVATION**	**K- NORTHWEST BASEMENT STAIRWELL**										
Immediate	NW Stair	Perform patching repairs to the spalled concrete slab edge over the basement door	1LS	$7,500	$7,800	$8,100	$1,875	$1,950	$2,025	$9,375	$9,750	$10,125
High	NW Stair	Remove cracked and debonded exterior stucco from the building wall. Install new stucco, repoint joints between the glass block units, and replace sealant joints around windows. Repoint mortar joints in the stone and brick masonry above the windows.	1LS	$6,500	$6,760	$7,020	$1,625	$1,690	$1,755	$8,125	$8,450	$8,775
		Subtotal		**$14,000**	**$14,560**	**$15,120**	**$3,500**	**$3,640**	**$3,780**	**$17,500**	**$18,200**	**$18,900**
Priority	**ELEVATION**	**L- EAST ELEVATION WINDOW WELLS**										
Low		and debris to determine if a drainage system is present. Have the drainage system scoped by a plumber and cleared if obstructed.	Not Priced									
Priority	**ELEVATION**	**M- POTENTIAL TRIP HAZZARDS**										
1 Year	East	East Elevations on South End-Replace the deteriorated stone tread and quarry tiles at the entrance to the open patio area.	1LS	$6,000	$6,240	$6,480	$1,500	$1,560	$1,620	$7,500	$7,800	$8,100
1 Year	East	At SE Corner of Building; Remove and relevel the flagstone pavers around the irrigation box.	1LS	$3,500	$3,640	$3,780	$875	$910	$945	$4,375	$4,550	$4,725
		Subtotal		**$9,500**	**$9,880**	**$10,260**	**$2,375**	**$2,470**	**$2,565**	**$11,875**	**$12,350**	**$12,825**
		Grand Total		**$1,215,780**	**$1,264,411**	**$1,313,042**	*$303,945*	*$316,103*	*$328,261*	**$1,519,725**	**$1,580,514**	**$1,641,303**

FELT MANSION

LIMITED BUILDING ENCLOSURE ASSESSMENT

HOLLAND, MICHIGAN

Prepared For:

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RRJ 24146

January 17, 2025

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FELT MANSION
LIMITED BUILDING ENCLOSURE ASSESSMENT
6597 138TH AVENUE, HOLLAND, MI 49423

INTRODUCTION

Raths, Raths & Johnson, Inc. (RRJ) visited the Felt Mansion (Property) on October 25 and November 19, 2024, to perform investigative activities associated with water intrusion occurring at multiple locations through the rear terrace, deterioration of the limestone terrace railing, and other conditions related to the exterior of the building. At the request of EV Construction, who is assisting the Property with developing and prioritizing a scope of exterior repairs, RRJ has prepared this report summarizing our observations and conceptual recommendations to address the observed issues.

Specific activities included:

- Discussion with Property staff for a general understanding of current issues and recent maintenance performed at the historic residence.
- Limited review of the architectural and structural record documents for a general understanding of the building construction.
- Visual examination and photo documentation of the as-built exterior wall systems were readily visible from the interior and exterior. No interior finishes were removed as part of this scope.
- Limited sounding of stone at the main entrance.
- Investigative openings at two locations at the exterior terrace to observe the waterproofing system.

PROJECT DESCRIPTION

The Property is a two-and-a-half-story historic structure over a basement and is located just off the eastern shore of Lake Michigan, between Holland and Saugatuck, Michigan, adjacent to Saugatuck Dunes State Park. The Property was originally constructed between 1925 to 1928 as a private residence and was listed on the National Register of Historic Places in 1996 (Figure 1 through Figure 3). The structure primarily consists of reinforced cast-in-place concrete; the exterior walls are mass masonry with brick and clay tile, steel lintels are located above window and door openings; and the steep-slope roof consists of concrete deck covered with natural slate tiles. There is an

exterior terrace on the west side of the residence, which is located over conditioned storage space at the basement level. Following several changes in ownership, use, and interior modifications, Laketown Township took possession of the Property in the 1990s with the intent to preserve the Property for public use. Starting in 2001, the residence has had incremental restoration work performed. Currently, it is used as a historic house museum and event venue.

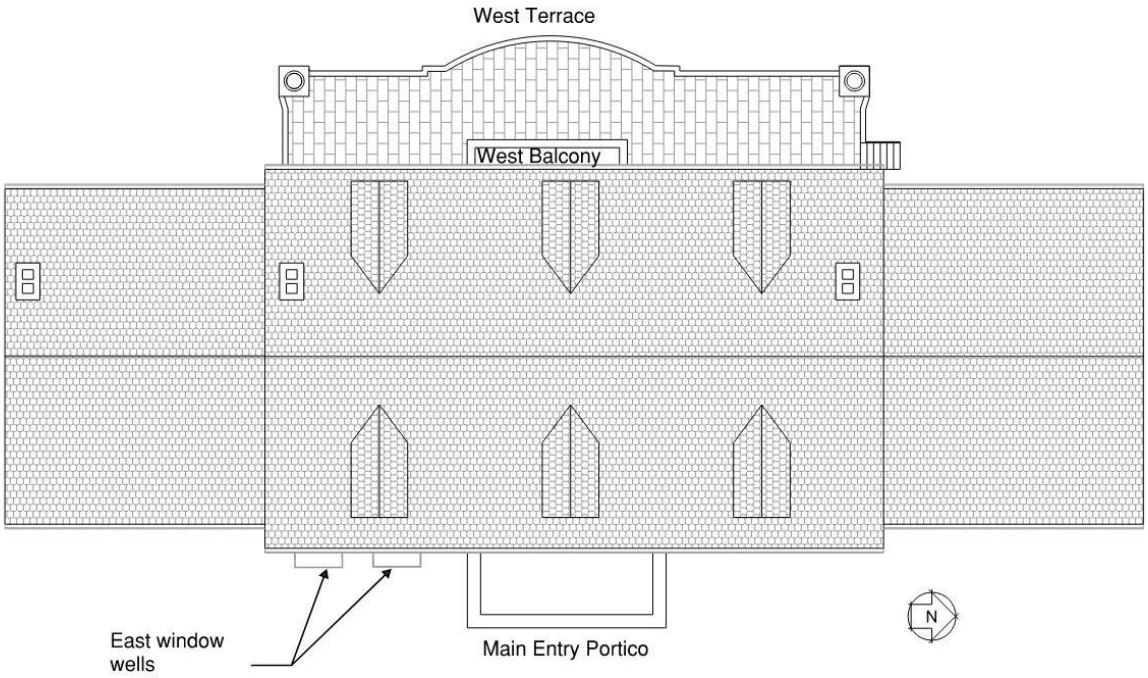


Figure 1. Roof plan of main residence.

Figure 2. Felt Mansion, front (east) elevation.
[20241025_alb\IMG_8452.jpg]

Figure 3. Felt Mansion, rear (west) elevation.
[20241025_alb\IMG_8431.jpg]

Based on an interview with The Felt Estate Executive Director Elizabeth McEwen, RRJ understands that several areas of the property are experiencing moisture-related issues. Ongoing leaks were reported in the basement storage area directly below the West Terrace. Water infiltration was also reported in the basement storage area known as the Christmas Room directly below the Parlor on the east elevation. Water infiltration associated with the

West Balcony was also reported. Distressed interior finishes have been located on the east and west sides second floor bedroom walls, generally aligning with downspouts. Distressed flooring was also noted near the west Parlor windows near the downspout. The West Terrace and West Balcony have been identified by The Felt Estate as priority areas for restoration.

OBSERVATIONS AND CONCEPTUAL RECOMMENDATIONS

Exterior Masonry Walls, Main Residence

Observations:

- The exterior walls are mass masonry with the outermost wythe of buff face brick. The joints are finished with a buff pointing mortar and are raked (Figure 4).
- Mortar joints on the primary portion of the residence were generally serviceable and in good condition.
- Previous repair efforts resulted in localized areas of poorly repointed mortar geometry and mortar that is not a good aesthetic match (Figure 5).
- Localized areas of mortar loss were present where joints were cracked, open, or weathered to an extent that the water resistance of the mortar is compromised (Figure 6).

Recommendations:

High Priority (2 to 5 years)

- Perform localized repointing of cracked, open, and weathered mortar joints with a Type N buff mortar with aggregate to match the existing mortar. The joints should be raked to match the existing joint profile.

Medium Priority (5 to 10 years)

- Perform localized repointing of mismatched mortar from previous repairs with a Type N buff mortar with aggregate to match the existing mortar and rake the joints to match the existing joint profile.

Figure 4. Typical raked masonry joint. [20241119_lmb\PXL_20241119_171150176.jpg]

Figure 5. Localized area of repointing where the mortar is a poor aesthetic match (red box). [20241119_alb\IMG_8786.jpg]

Figure 6. Localized area of mortar deterioration on the west elevation (red box). [20241119_alb\IMG_8786.jpg]

Periodic Maintenance

- Visually inspect mortar joints every two years for areas of weathering or mortar loss. Perform repointing as needed as periodic maintenance.

Steel Window and Door Lintels

Observations:

- Steel lintels support the masonry wall over the door and window openings (Figure 7), except at the arched windows on the east (front) elevation.
- The steel lintels exhibited evidence of corrosion in the form of corrosion staining of the exposed painted edge, mortar loss at the bearing edges, deflection, and isolated locations of brick cracking (Figure 8).

Recommendations:

Lower Priority (10+ years)

- Remove the brick masonry above the existing lintels, clean the existing steel, apply a corrosion-resistant high-performance coating, install membrane flashing with a copper drip edge, terminate with stainless steel termination bar and sealant, and reinstall the brick masonry.
- Replace the lintels in kind where corrosion is severe, where the lintel exhibits section loss, or where the existing lintel is deflected.

Figure 7. Mortar loss at the bearing end and minor deflection of the steel window lintel (red arrow). [20241119_alb\IMG_8831.jpg]

Figure 8. Steel lintel at the south elevation with corrosion staining. [20241119_lmb\PXL_20241119_201334983.jpg]

Windows and Doors

Observations:

- The existing windows on the west, south, and north elevations are wood, double-hung units.
- On the east elevation, wood double-hung and casement window units are present, as well as steel casements that serve as storm windows for the large, arched windows.
- At the wood windows, the paint was generally observed to be reaching the end of its service life, with alligatored (cracked) and debonded areas of

Figure 9. Cracked and failed paint on a window jamb at the west elevation. [20241119_lmb\PXL_20241119_193223822.jpg]

paint (Figure 9). The paint was very thick and appeared to be the result of multiple applications over time.

- Glazing putty was observed to be brittle and debonded (Figure 10).
- At the steel framed windows, the paint was also reaching the end of its service life and exhibited cracks and debonded areas. The paint was very thick and appeared to be the result of multiple applications over time (Figure 11). Spots of corrosion staining were observed bleeding through the paint.
- Similar paint conditions were observed on exterior door frames and trim.

Recommendations:

High Priority (2 to 5 years)

- Strip the existing paint from all exterior window sashes and frames and repaint all surfaces. Window sashes may need to be removed to facilitate repainting and reglazing.
- Remove existing aged and failed glazing putty and reglaze all windows with a traditional linseed oil putty.
- Where applicable, perform similar repairs to exterior doors, maintaining the historic door finish and repainting exterior frames and trim.
- Prior to performing any paint or putty removal, have the materials tested for the presence of Lead-Based Paint (LBP) and Asbestos-Containing Materials (ACM) by a qualified environmental consultant and perform abatement, as required.

Figure 10. Debonded glazing putty at a window on the west elevation. [20241119_lmb\PXL_20241119_193233125.jpg]

Figure 11. Heavy paint accumulation and corrosion staining at the east elevation steel storm windows. [20241119_lmb\PXL_20241119_195935987.jpg]

Roofing, Eaves, and Cornices

Observations:

- The existing roofing on the main roof was variegated natural slate tile. The slate roof appeared to be in serviceable (good) condition, with limited locations of loose or missing slates (Figure 12).
- The painted surfaces of the wood eave, including the fascia boards, soffits, corbels, and trim boards, were in fair to poor condition, with areas of cracked and debonded paint (Figure 13). The paint of these components is reaching the end of its service life.

Figure 12. The slate roofing, looking east from the widow's walk. [20241119_lmb\PXL_20241119_184529439.jpg]

Figure 13. Failed paint at the eave (red box). [20241119_lmb\PXL_20241119_201424405.jpg]

Recommendations:

High Priority (2 to 5 years)

- Perform 100 percent up-close inspection of the wood fascia, soffit, and trim boards. Stabilize and mechanically secure any loose components. Replace boards in kind where deteriorated.
- Removal all loose and failed paint and repaint the wood eave and cornice, including at the gable ends and similar detailing at the dormer windows.
- Test for LBP prior to performing work and perform abatement as required.

Periodic Maintenance

- Visually inspect the slate roof annually and after heavy storm events for missing slates, loose slates, or other conditions which may affect the watertightness of the roofing.

Gutters and Downspouts

Observations:

- The gutters were copper-lined box gutters concealed within the eaves and were not accessible for direct observation. Evidence of leakage at gutter corners and ends was observed in the form of damage to the wood eave and soffit (Figure 14).
- The downspouts were copper, with copper conductor heads, and were connected to below-

Figure 14. Damage to the wood eave and trim from leakage at the gutter end (red arrow). [20241119_lmb\PXL_20241119_201424405.jpg]

grade leaders to direct water away from the building.

- The downspouts at the east-west elevations appeared to be leaking, causing mortar loss and water intrusion to the interior (Figure 15).
- In some locations, the downspouts were damaged or disconnected from the leaders, allowing water to drain against the building wall (Figure 16).

Recommendations:

Immediate

- Remove wood trim as required and perform localized resealing and repairs to gutter ends and corners to address water leakage.
- Repair or seal downspouts at the conductor heads and flood test to check the downspouts for pinholes and leaks at joints. Seal pinholes or perform copper repairs to large defects to restore watertightness.
- Replace damaged sections of downspouts in kind and reconnect to the below-grade leaders.

Periodic Maintenance

- Clean gutters annually to remove accumulated debris and blockage.

Figure 15. Leaks at the downspout, causing mortar deterioration and water intrusion on the interior (red box). [20241119_alb\IMG_8811.jpg]

Figure 16. Damaged downspout at the west elevation. [20241119_lmb\PXL_20241119_193209770.jpg]

East Portico

Observations:

- A stone portico is present over the main entry to the residence on the east elevation (Figure 17). The portico is supported by six free-standing sandstone columns, which support a sandstone entablature.
- The sandstone appeared to be Berea sandstone from Ohio, possibly Birmingham Buff, which is still in production by Cleveland Quarries. Indiana Buff limestone may be an aesthetically acceptable alternate if Berea sandstone is not available in the unit sizes required or is prohibitively expensive.
- The roof of the portico was originally edged with a limestone railing; the railing is deteriorated, and

Figure 17. Portico at the east entry, showing staining of the stone columns and the partially missing stone railing. [20241129_lmb\PXL_20241119_200650103.jpg]

many of the units are now missing (Figure 18). The stone and partial railing that remain in place were loose and severely deteriorated.

- While onsite, RRJ sounded the limestone corbels below the cornice. At the direction of RRJ, EV Construction removed a piece of loose stone from the cornice (Figure 19).
- The corners of the portico are deteriorated from long-term water infiltration into the cornice, and the stone units are displaced (moved out of place) (Figure 20). The displacement of the cornice has caused stress fractures in the tops of the column shafts (Figure 21).
- The portico roofing was a single-ply EPDM membrane, partially concealed by walkway pads and debris. A flat-seam copper roof is noted in the original design drawings and may still be in place below the EPDM.
- The columns exhibited discoloration (staining) and deep contour scaling (loss of stone material) (Figure 22). These conditions are likely natural aging and weathering of the sandstone but are exacerbated by continued saturation of the stone, likely due to overspray from landscaping irrigation.

Recommendations:

Immediate

- Overhead hazards are present at the portico that pose life-safety issues to building occupants. The overhead hazards are expected to rapidly deteriorate following additional freeze-thaw cycles. The front portico and walkway should be closed to visitors until the portico can be assessed by a structural engineer.
- Remove all remaining loose and deteriorated railing stone units and loose stone units sitting on the portico roof.
- Engage a structural engineer experienced with mass masonry construction to investigate the condition of the entablature and columns, along

Figure 18. Severely deteriorated and loose stone railing over the portico. [20241119_lmb\PXL_20241119_185340302.jpg]

Figure 19. EV construction, removing a loose piece of stone from the portico cornice. [20241119_alb\IMG_8752.jpg]

Figure 20. Deteriorated mortar joints, deteriorated stone, displaced stone units, and daylight visible through the corner of the portico.
[20241119_lmb\PXL_20241119_200346341.jpg]

with any internal structural members or metal anchors, to determine the full scale of stone stabilization and reconstruction needed. Destructive investigation and/or partial disassembly of the portico entablature may be required to complete the assessment.

High Priority (no more than 2 years)

- Stabilize or reconstruct the distressed portico entablature per the structural engineer's stamped design. Limestone may be considered as an alternate material to sandstone for improved durability and cost-effectiveness.
- Replace or stabilize the stone columns per the structural engineer's design.
- Replace the existing EPDM roofing membrane with a new single-ply roofing system with perimeter copper edge metal that extends to the edges of the portico with a metal edge trim, to protect the cornice from water infiltration from above.

Lower Priority (10+ years)

- Install a reproduction railing to restore the portico to the c. 1928 appearance. The reproduction railing should be fabricated of a lightweight material such as glass fiber-reinforced plastic (GFRP).

Figure 21. Stress fracture of the column shaft (red arrow). [20241119_lmb\PXL_20241119_200346341.jpg]

Figure 22. Contour scaling (stone loss) at the stone columns. [20241119_lmb\PXL_20241119_200445151.jpg]

West Terrace Vestibule

Observations:

- The primary entry on the west elevation features a small vestibule that projects onto the terrace (Figure 23). The vestibule has brick masonry walls and a brick and stone masonry parapet and railing.
- Above the level of the window lintels, the masonry wall, parapet, and railing were significantly distressed, with evidence of long-term water infiltration at the cornice and railing (Figure 24).
- The steel lintels were heavily corroded and had deflected, resulting in displacement of the masonry wall, and the parapet and railing had also rotated out of plane (Figure 25).

Figure 23. West vestibule, looking north, note the outward displacement of the brick masonry at the corner (red arrow). [20241119_lmb\PXL_20241119_193125513.jpg]

- Several of the stone balusters of the railing were missing, and others were severely deteriorated and loose (Figure 26). Several units at the top horizontal stone railing were also loose (Figure 27).
- The roofing was a single-ply EPDM membrane; a flat-seam copper roof is noted in the original design drawings and may still be present under the EPDM. Perimeter copper flashing was visible below the EPDM termination. The roofing was mostly concealed by walkway pads and debris.
- In 2024, the concealed downspout at the vestibule roof, also known as Constance's balcony, was repaired by a contractor. This repair work reportedly resulted in damage to the roof drain flashing.

Recommendations:

Immediate

- Overhead hazards are present at the vestibule that pose life-safety issues to building occupants. Close Constance's balcony from public access. Remove all remaining loose and deteriorated railing stone units and loose stone units sitting on the vestibule roof.
- Consult with a structural engineer and install temporary stabilization of the brick masonry wall above the lintels.

High Priority (no more than 2 years)

- Deconstruct the stone cornice and the exterior wythe of the brick at the vestibule exterior wall down to the tops of the first-floor windows. Where possible, salvage and reinstall stone masonry and face bricks. Take care not to disturb the roof structure during the repairs, which may require masonry work to be performed in phases.
- Replace the failed steel lintels and install membrane flashing with a stainless-steel termination bar and sealant and a copper drip edge.

Figure 24. Corrosion and deflection of the steel window lintels, resulting in distress and displacement of the masonry wall above. [20241119_lmb\PXL_20241119_171711443.jpg]

Figure 25. Out-of-plane displacement of the brick due to corrosion of the steel lintel. [20241119_alb\IMG_8808.jpg]

Figure 26. Severe deterioration of the stone balusters. [20241119_alb\IMG_8667.jpg]

- Reconstruct the brick masonry and stone cornice to match the existing.
- Replace the existing EPDM roofing membrane with a new single-ply roofing system that extends to the edges of the vestibule with a copper metal edge trim to protect the cornice and exterior walls from water infiltration.
- Repoint all remaining brick work at the vestibule.
- Reconstruct the brick and stone masonry railing to match the c. 1928 appearance. (Alternate option: Install a reproduction railing of a lighter-weight material, such as GFRP.

Figure 27. Deterioration and failure of the stone balusters, looking northwest.
[20241119_lmb\PXL_20241119_172850174.jpg]

West Terrace Waterproofing

Observations:

- On the west side of the building, the rear door exits onto an elevated terrace (Figure 2827). The terrace is located over conditioned storage space in the basement.
- At the direction of RRJ, EV made four small openings at the west terrace to investigate the waterproofing system and overburden (Figures 28 and 29). The existing system at the west terrace (from top to bottom):
  a. Two-inch thick pavers
  b. Shallow sand bed.
  c. Cast-in-place concrete topping slab with wire mesh, approximately 2 to 3 inches thick.
  d. Coal-tar pitch (CTP) membrane.
  e. Cast-in-place concrete structural slab.
- The CTP membrane is likely the original waterproofing membrane for the terrace. Based on the numerous points of water intrusion into the basement below, the CTP membrane has exceeded the end of its service life.
- Plaza drains were located at various points on the terrace, and overflow scuppers through the terrace wall were present. The drains appeared to be

Figure 28. West terrace, looking south.
[20241025 alb\IMG 8447.jpg]

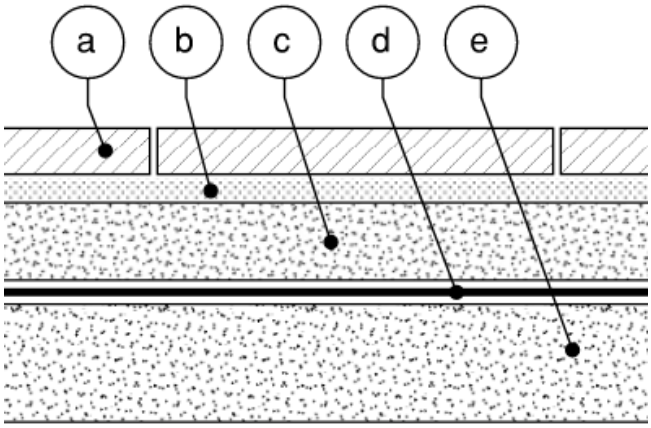


Figure 29. Cross section of existing terrace waterproofing:
a. Two-inch thick pavers
b. Shallow sand bed.
c. Cast-in-place concrete topping slab with wire mesh, approximately 2 to 3 inches thick.
d. Coal-tar pitch (CTP) membrane.
e. Cast-in-place concrete structural slab.

functional, but the scuppers were blocked by the pavers and by plant growth.

- Water was observed seeping through the masonry of the lower radiused west masonry wall below the terrace (Figure 31).
- In the basement rooms immediately below the terrace, active water intrusion was observed through cracks in the structural slab. Areas of spalled concrete with exposed reinforcing were also observed (Figure 32). The presence of mineral deposits at the cracks is consistent with long-term water infiltration.
- At the terrace slab-to-building wall transition, active water intrusion was also observed at multiple locations (Figure 33).

Recommendations:

High Priority (2 to 5 years)

- The terrace waterproofing has exceeded its useful service life and requires full replacement. Perform repairs to the terrace in the following sequence:
  1. Remove the perimeter railing to allow for waterproofing replacement, as described below.
  2. Test the CTP membrane and flashing for ACM prior to removal; perform abatement as required.
  3. Perform non-destructive testing of the structural slab to verify the extents of concrete repairs required. This may include methods such as Surface Penetrating Radar (SPR or GPR), Ultrasonic Pulse Velocity (UPV),
  4. Remove the existing pavers and topping slab to expose the CTP membrane.
  5. Remove the existing CTP waterproofing membrane down to the concrete deck and scarify the concrete surface to remove CTP residue.
  6. Perform repairs to the concrete deck, including epoxy crack injection and concrete

Figure 30. Investigation opening, showing CTP waterproofing under the concrete topping slab. [20241119_alb\IMG_8737.jpg]

Figure 31. Water is actively seeping through the lower west wall. [20241119_lmb\PXL_20241119_194926437.jpg]

Figure 32. Cracks and spalls in the structural slab, viewed from the underside of the terrace deck. [20241119_lmb\PXL_20241119_172346046.jpg]

patching as required and directed by a structural engineer.

7. Replace terrace drain bowls and ensure drain leaders are clear and functional.
8. Install a new waterproofing membrane, flashing, and drainage mat. Ensure the waterproofing membrane is properly flashed and sealed at drains, suppers, the terrace wall, and the building wall to prevent leaks.
9. Clean out the existing scuppers and potentially install additional weeps along the lower west wall to facilitate drainage of the terrace system.
10. Reinstall the stone railing and perform repairs to the west wall as described below.
11. Install new pavers in a sand bed over the drainage mat. Install polymeric sand in the paver joints. Pavers should be sloped $^{1}/_{8}$ inch in 12 inches (1 percent slope) towards terrace drains to facilitate surface drainage.

Additional Considerations for Terrace Repairs:

- For the new waterproofing membrane, A hot-applied asphalt membrane is recommended for durability and performance. However, other options are available at potentially a lower initial cost but also a shorter service life, including cold-applied urethane coating, modified bitumen sheet membranes, and adhered single-ply membranes.
- CTP is toxic and requires special removal procedures to protect workers and minimize the creation of dust and debris. The property should be closed to visitors, all windows and doors closed, and HVAC systems deactivated during CTP removal.
- Encapsulation of the CTP by applying a new waterproofing system over the existing membrane may be an option but should be considered in consultation with a waterproofing membrane

Figure 33. Water intrusion along the terrace-to-building wall transition. [20241119_lmb\PXL_20241119_172346046.jpg]

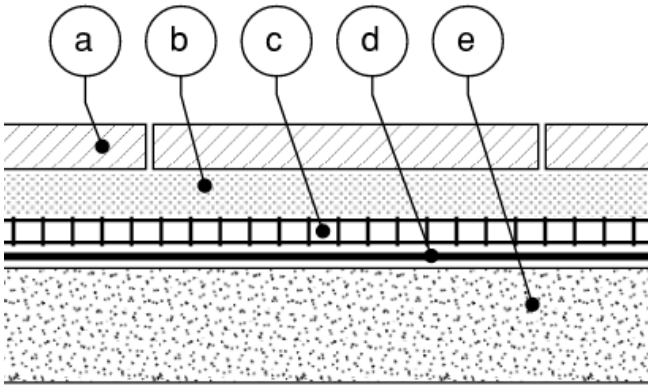


Figure 34. Cross section of conceptual new terrace waterproofing system:

a. New concrete pavers with polymeric sand in joints.
b. Sand setting bed.
c. 1-inch drainage mat with filter fabric.
d. Waterproofing membrane, new or applied over the CTP (see "*Additional Considerations*")
e. Existing cast-in-place concrete structural slab.

manufacturer to verify chemical compatibility between the systems.

- Dehumidification of the basement storage rooms may be considered to control condensation in this space.

West Terrace Railing

Observations:

- The western edge of the terrace is bounded by a railing with a stone top rail, stone bottom rail, stone balusters, and stone piers (Figure 35). The railing sits atop the west lower wall.
- The balusters were installed with ferrous pins into the top and bottom rails (Figure 36). These pins were corroded, resulting in cracked, damaged, and loose balusters at numerous locations (Figure 37).
- Multiple top rail units were also observed to be loose, and in one section near the north end of the terrace, the entire railing shifted with moderate hand pressure (Figure 38).
- Sealant had been applied at stone-to-stone joints in the top rails. The sealant exhibited adhesive and cohesive failures, and the mortar joints under the sealant were heavily deteriorated.
- The railing was generally in poor condition, with observable distress to the masonry units and joints. In its current condition, some areas of the railing likely do not withstand code-requirement loading for railings and present a potential fall hazard for occupants of the terrace.
- The wall below the railing is also distressed, with displaced masonry and water infiltration issues (see below).

Figure 35. West terrace railing, with multiple damaged stone pilasters and loose top rail units. [20241119_alb\IMG_8841.jpg]

Figure 36. Cracked and failed balusters due to corrosion of ferrous pins. [20241025_alb\IMG_8449.jpg]

Figure 37. Cracked and failed balusters due to corrosion of ferrous pins. [20241025_alb\IMG_0440.jpg]

Recommendations:

Immediate

- Prevent visitors from directly accessing areas of the railing that are loose or unstable. This can be accomplished by closing the terrace to visitors or a combination of selective positioning of obstacles or

blockades (such as planters) to prevent visitors from leaning on the railing, new temporary railings, signage directing visitors not to touch the railing, and other methods that create physical distance between visitors and the existing stone railing.

- Provided that these measures function to keep visitors safe, they can be left in place until full repairs to the railing can be performed.

High Priority (2 to 5 years)

- Remove the existing railing, including top rail, balusters, bottom rail, piers, and other units. Document and salvage all undamaged stone units suitable for reinstallation. Approximately 50 percent of the balusters may require full replacement due to damage from ferrous pins.
- Perform terrace waterproofing repairs described above.
- Reinstall the stone railing to match the existing appearance. Stone anchors and reinforcing shall be installed per the design of a structural engineer. Replace damaged or missing stone units in kind. Clean all stone surfaces after the railing has been reconstructed.
- Joints between stone units should be pointed with Type N mortar, and all metal components, such as embedded hardware and anchors, should be stainless steel.

Figure 38. Area of loose railing near the north end of the terrace. [20241025_alb\IMG_8439.jpg]

West Terrace Lower Wall

Observations:

- The western edge of the terrace is formed by a brick and stone masonry wall (Figure 39).
- The lower west wall was significantly distressed due to long-term water infiltration from the leaking terrace waterproofing system above the wall. Water was observed to be actively seeping through the wall at the time of the site visit.

Figure 39. Lower west wall, showing discoloration and displacement from water intrusion.
[20241119_lmb\PXL_20241119_171747625.jpg]

- Multiple areas of displaced (out of plane) masonry were observed, including around the entry to the basement (Figure 40).
- Scaling, soiling, and deterioration were observed at the stone, likely the result of long-term saturation of the masonry from the plaza above.
- At stone-to-stone and brick-to-stone joints, sealant had been installed (Figure 41). The sealant was easily pulled from the joints, revealing trapped water within the masonry wall and severe deterioration of the underlying mortar.
- Mortar joints in the brick masonry were deteriorated, with open and weathered joints in multiple locations.
- Biological growth had colonized areas of the wall, growing from open mortar joints, including moss, algae, and woody plants (Figure 42).

Recommendations:

High Priority (2 to 5 years)

- Repairs to the lower west wall should be performed simultaneously with repairs to the stone railing and terrace waterproofing above.
- Clean the lower west wall with an architectural biocide prior to performing repairs.
- Partially deconstruct and reconstruct the stone and brick masonry around the basement door to address out-of-plane movement.
- Remove all sealant at all joints. Fully repoint all brick and stone joints with Type N mortar.
- Replace existing door lintel and provide through-wall flashing.
- Replace existing door and frame. The door opening is an atypical size and may require a custom door.

Figure 40. Displacement and severe distress to masonry around the basement entry door, with active water seepage. [20241119_lmb\PXL_20241119_194934081.jpg]

Figure 41. Sealant at stone-to-stone joints, with deteriorated mortar below. [20241119_alb\IMG_8862.jpg]

Figure 42. Plants growing from open mortar joints in the west wall; note also the scaling on the stone. [20241119_lmb\PXL_20241119_194831688.jpg]

Northwest Basement Stairwell

Observations:

- At the northwest corner of the building, a concrete stair and retaining wall provides access to the basement level (Figure 43). The door at this location has been blocked up with concrete masonry units.
- The retaining wall exhibited significant cracking and spalling, likely from an alkali-silica reaction (ASR), which is a material issue internal to the concrete that causes deterioration because of reactive aggregate.
- The overhanging slab edge exhibited concrete spalling and exposed reinforcing steel (Figure 44).
- The glass block windows on the building wall had leaks on the interior, and the stucco parge coating on the wall around the windows was cracked and partially debonded (Figure 45).
- The concrete stairs were generally in fair condition, with some spalling at the nosings due to corrosion of the traction strips.
- The bottom of the stairwell was filled with leaves and debris.

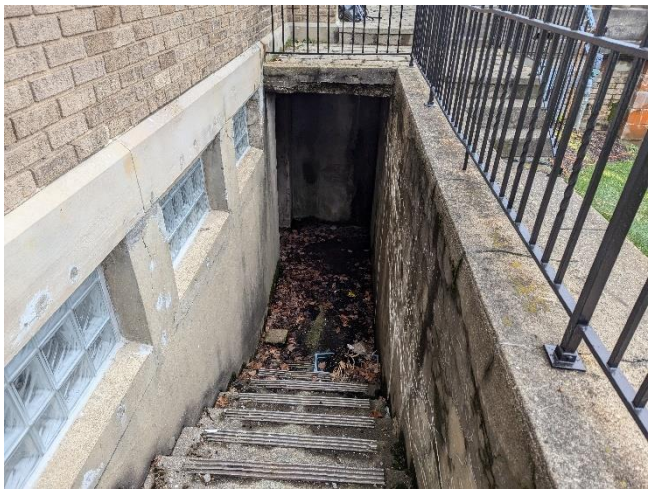


Figure 43. The northwest stairwell. [20241119_lmb\PXL_20241119_195359247.jpg]

Figure 44. Concrete deterioration at the terrace slab edge over the stairwell. [20241119_lmb\PXL_20241119_195359247.jpg]

Figure 45. Cracked and debonded stucco around the glass block windows. [20241119_lmb\PXL_20241119_195410860.jpg]

Recommendations:

Immediate (1 year)

- Perform patching repairs to the spalled concrete slab edge over the basement door

High Priority (2 to 5 years)

- Remove cracked and debonded exterior stucco from the building wall. Install new stucco, repoint joints between the glass block units, and replace sealant joints around windows. Repoint mortar joints in the stone and brick masonry above the windows.

Medium Priority (5 to 10 years)

- Remove the existing concrete stairs and retaining wall and install a new stair and retaining wall. (Alternate option: Consider permanently removing the stairwell by infilling the glass block windows,

waterproofing the exterior wall, and backfilling the area.)

Periodic Maintenance

- Regularly clean leaves and debris from the bottom of the stairwell.

East Elevation Window Wells

Observations:

- Several windows at the basement level on the east elevation were set into window wells, covered by metal grates (Figure 46).
- Standing water was observed in several window wells, which is likely the cause of water intrusion around these openings in the basement.
- Per the original drawings for the residence, the window wells should have drains.

Figure 46. Window well at the east elevation with standing water. [20241119_lmb\PXL_20241119_200826035.jpg]

Recommendations:

Lower Priority (Anytime)

- Pump standing water from window wells and provide temporary cover over wells to divert bulk water.
- Remove leaves and debris to determine if a drain is present. Have the drain scoped by a plumber and cleared if obstructed.
- If a drain is not present, consider installing a drain and connecting it to an existing storm sewer leader or providing a new discharge point. This will prevent standing water in the window wells and reduce water intrusion at these locations

Potential Trip Hazards

Observations:

- A potential trip hazard was observed at the east elevation on the south end, where there are two low steps into the open patio area (Figure 47). The stone tread and quarry tiles were deteriorated.
-
- A potential trip hazard was observed in the flagstone paving near the southeast corner of the building (Figure 48). The pavers had settled around the landscape irrigation system box.

Recommendations:

Immediate (1 year)

- Replace the deteriorated stone tread and quarry tiles at the entrance to the open patio area.
- Remove and relevel he flagstone pavers around the irrigation box.

Figure 47. Deteriorated stone tread and pavers that are a potential trip hazard.
[20241119_lmb\PXL_20241119_201137328.jpg]

Figure 48. Unlevel flagstone paving that is a potential trip hazard (red box).
[20241119_lmb\PXL_20241119_201157974.jpg]

CLOSING

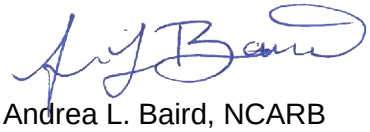
This report concludes RRJ's initial field investigation. The opinions expressed in this report are based on information available at the time of its writing and the scope of services performed to date. Our findings and recommendations are, in part, based on information provided by our client. Our recommendations within this report are conceptual in nature and are not anticipated to be sufficient for construction or repairs.

Furthermore, RRJ's investigation was performed at limited areas of the property, as described within this report, and it should not be inferred that a comprehensive evaluation of all building areas was performed. As such, it is likely that latent or hidden defects may exist, and it should not be inferred that all defects have been either observed or recorded during this investigation. RRJ reserves the right to supplement and amend this report, to the extent necessary, following receipt and review of additional pertinent information that becomes available following the date of this report.

Upon conclusion of your review of this report, RRJ welcomes the opportunity to discuss the findings, conclusions, and recommendations indicated herein and to discuss options for repairs and coordination of subsequent activities. We appreciate the trust that you have provided in our firm and the opportunity to work with you on this project. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Respectfully submitted,

RATHS, RATHS & JOHNSON, INC.



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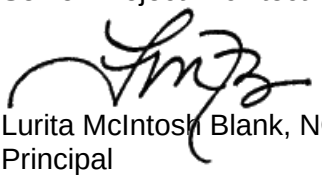

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