

**ERIE COUNTY TECHNICAL SCHOOL
AGENDA ITEM**

DATE: January 21, 2015

SUBJECT: Chimney Demolition

CATEGORY: Operations

INITIATED BY: Aldo Jackson

DESCRIPTION:

Deterioration of the chimney has progressed to the point where the risk of brick and other parts falling off could be hazardous to students in the courtyard. See attached reports and photos.

MOTION:

Motion to authorize the administration to design specifications and seek bids on the demolition of the chimney, reengineering of exhausts for boilers and water heaters, and restoration of building exterior.



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10/9/14

Erie County Technical School
8500 Oliver Rd.
Erie, PA 16509

Attn: Del VonVolkenberg

Introduction:

Northwest Restoration, Inc. performed a complete survey of the chimney stack located at the Erie County Technical School on October 9, 2014. A 60' manlift was utilized to access the stack on all elevations. A thorough inspection was performed and loose material was removed from the veneer course of brick. At the same time, an inspection hole was created to determine the composition of the interior wythes of brick.

Construction:

- The stack is approximately 55' tall from ground level to concrete cap.
- There are two separate flues, one for the venting of hot water and boiler tanks and the other for venting of the incinerator (not in use).
- It appears the stack has an interior brick liner, followed by one (1) middle wythe of brick, and an exterior veneer course of brick. This may be confirmed by checking with blueprints from original construction.
- The cap is a poured-in-place concrete cap.
- As seen from the inspection, there is an air space of approximately 2" to 3" between the middle courses of brick and the veneer course.

Results:

Northwest Restoration (NWR) determined the cause for the efflorescence, brick spalling and mortar joint failure to be a combination of condensation from inside the stack and water intrusion on the exterior. It was found that the boilers and hot water heaters of the building vent into the stack. This introduces moisture into the stack from the vent gases. The interior liner, while structurally stable, allows this water vapor to pass through the interior masonry into the cavity between the interior brick and exterior brick. The middle wythe of masonry appears to be a "slush" wall with brick laid on the sides. This is common in older construction, but allows the moisture to permeate to the cavity between this wall and the exterior veneer brick, where it begins to deteriorate the brick from the inside out due to the freeze thaw cycle and seasonal variations in temperature. As the moisture escapes through the veneer brick, it causes efflorescence along with brick and mortar failure. In addition, once cracks form in the exterior veneer courses, it allows for water intrusion from the outside, further deteriorating the masonry.

Recommendations:

Although the material in immediate danger of falling was removed, there is nothing stopping the moisture from continuing to deteriorate the masonry and causing more failure due to boiler and hot water use, especially during the winter months. It is recommended restoration of the stack be completed within the next year as follows:

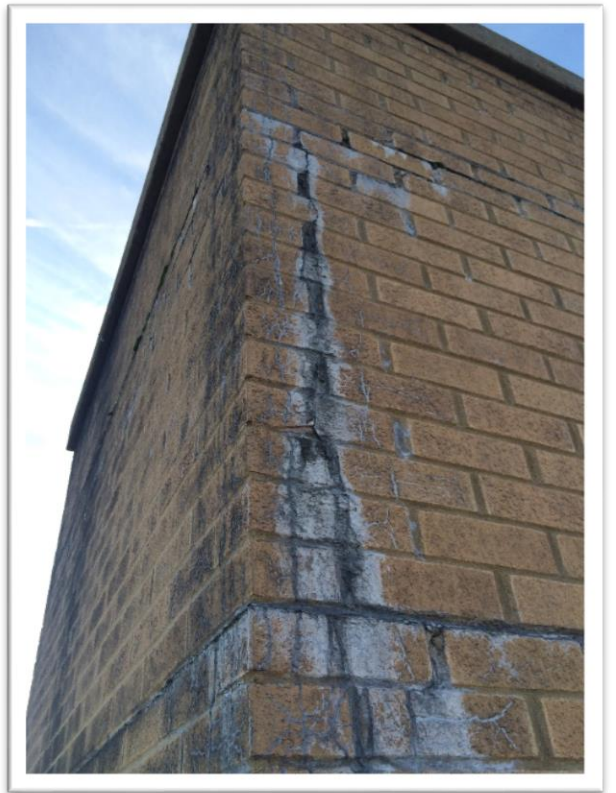
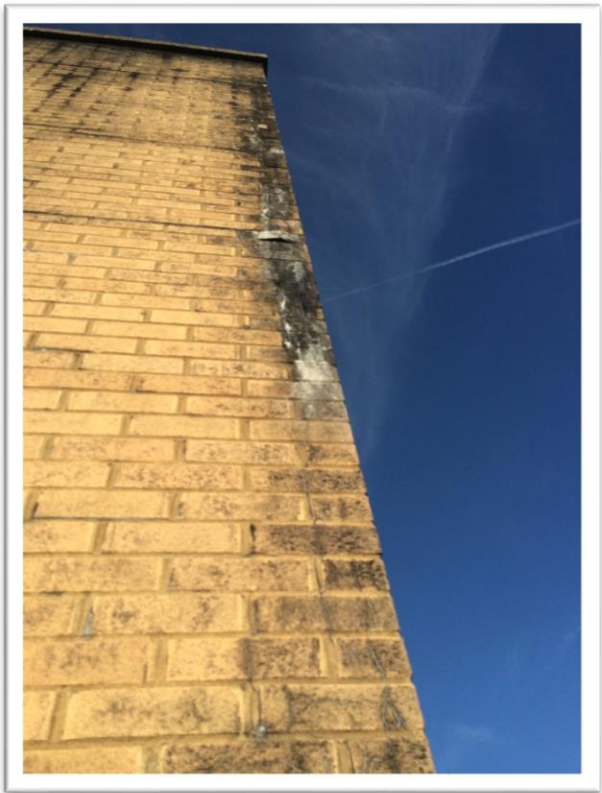
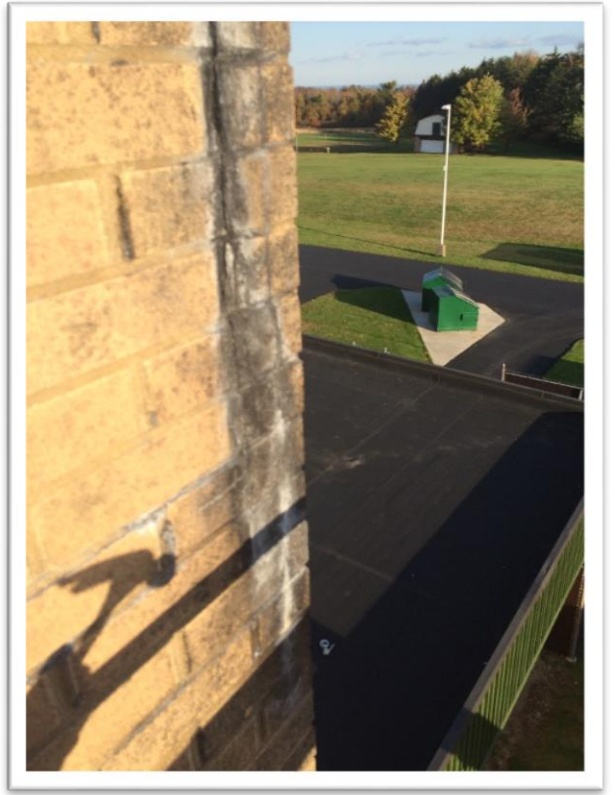
- Determine if the stack can be lowered according to building code and demolish down to that level.
- Strip the remaining veneer course of brick down to ground level due to extent of deterioration.
- Repair middle wythe of brick as necessary.
- Install new brick veneer.
- Install stainless steel insulated flue liner to prevent moisture into the masonry.
- Install a new concrete cap.

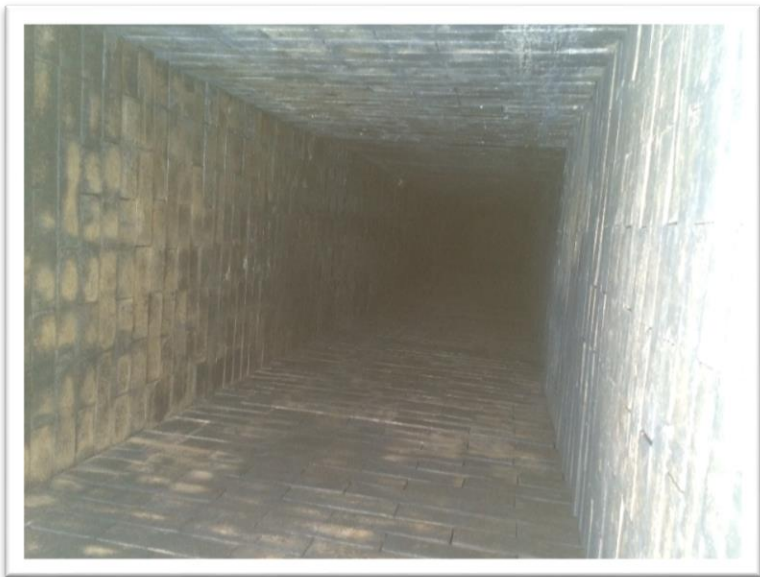
Northwest Restoration is currently working on a budgetary figure for this work and will forward an updated proposal when complete.

Sincerely,

A handwritten signature in blue ink, appearing to read "Matt Anderson", with a long horizontal flourish extending to the right.

Matt Anderson
Northwest Restoration, Inc.





Erie County Technical School
Chimney project

Recommendations from NW Restoration:

Although the material in immediate danger of falling was removed, there is nothing stopping the moisture from continuing to deteriorate the masonry and causing more failure due to boiler and hot water use, especially during the winter months. **It is recommended that access be restricted to the courtyard** and restoration of the stack be completed within the next year as follows:

- Determine if the stack can be lowered according to building code and demolish down to that level.
- Strip the remaining veneer course of brick down to ground level due to extent of deterioration.
- Repair middle wythe of brick as necessary.
- Install new brick veneer.
- Install stainless steel insulated flue liner to prevent moisture into the masonry.
- Install a new concrete cap.

HRL & C/Tower Engineering Recommendation:

- Demolish the existing stack, natural gas piping, domestic water piping, power conduits, wiring, hot water breeching sections, heating boiler breeching sections, incinerator breeching sections and any asbestos material.
- **General Contractor**– infill new brick, install new metal panels, patch roof, relocate cross-bracing and paint new and existing surfaces as required.
- **Plumbing Contractor** – Reroute natural gas piping and domestic water piping, install piping insulation as required.
- **Electrical Contractor** – Reroute power conduits and wiring, provide power supply to new breeching system.
- **HVAC Contractor**– Install hot water breeching sections, heating boiler breeching sections, draft control dampers and new chimney automation system.
- **Asbestos Abatement Contractor** – Remove any/all existing asbestos material.

Estimated Project Probable Construction Cost: \$96,000 - \$100,000

Estimated Total Probable Project Costs with Design/Engineering Fees: \$110,000

Proposed Schedule

February 2015 - Prepare construction documents for bidding

March 2015 – Bid Project

April 2015 – Award project

June 2015 – Begin Construction

August 2015 – Complete Construction

General Construction: (\$ 40,000.00)

- Demolition of existing stack to 12" below existing grade.
- Infill new brick and install new metal panels to match existing.
- Patch and flash roof as required.
- Relocate cross bracing.
- Paint new and existing surfaces as required.
- Remove and reinstall existing fencing and seed lawn as required.

Plumbing: (\$ 10,000.00)

- Demolition of natural gas piping & domestic water piping (to allow for breeching modifications).
- Rerouted natural gas piping and domestic water piping to replace sections removed. Domestic water piping insulation.

Electrical: (\$6500.00)

- Demolition of power conduits/wiring (to allow for breeching modifications).
- Rerouted power conduits/wiring to replace sections removed.
- Power supply to new breeching system.

HVAC: (\$30,000.00)

- Demolition of domestic hot water breeching sections, heating boiler breeching sections, and incinerator breeching sections.
- Domestic hot water breeching sections, heating boiler breeching sections, and draft control dampers.
- Chimney automation system (rooftop fans, controls, control wiring, connection to existing building automation system).

Asbestos: (\$ 10,000.00)

- Remove an all existing asbestos that may need to be removed as part of the project.