

06/07/2023

Dr. Mike Curry, COO
Decatur Public Schools #61
400 East Cerro Gordo
Decatur, IL 62523

RE: Structural Evaluation Observations and Recommendations of the Kaleidoscope School Building at 520 W. Wood St. in Decatur, Illinois.

Dear Dr. Curry:

On June 1, 2023, Structural Engineer Kyle Hannel, P.E. of Klingner & Associates performed a visual structural evaluation of the Kaleidoscope School Building at 520 W. Wood St. in Decatur, Illinois. We were informed that there were recent concerns with the structural integrity of the original building's exterior walls and parapets. The focus of our inspection and evaluation was limited to the exterior walls and parapets of the Kaleidoscope School building. The original 3-story portion of this school building was built in 1913 and was named New Wood Street School. In the 1970's and 1980's 2-story additions were added to the east and west side of the original school building and was named French Elementary School. Access to the existing building plans that the school district had available were made available to us to scan so we could have a copy to aid in our evaluation just prior to performing our inspections. We have included scans of a couple of important applicable drawings as attachments to this report. The Decatur Public School District had recently posted signage on the entrance doors of the Kaleidoscope school building to restrict access to the building entrance at the time of our inspection. Access to the building and the different interior rooms and areas of the original 3-story building was provided to us by the Decatur Public School maintenance personnel that escorted us during our inspection.

The following are our observations **and recommendations**:

Exterior Walls:

1. The exterior walls of the original 1913 3-story school building are made up of multi-wythe loadbearing brick walls. It appears that portions of the original 3-story Kaleidoscope school building have had brick tuckpointing done on the exterior wythe of brick at some time since the original construction. The portions of brick that have not been tuckpointed have mortar joints that are deteriorated. The mortar has eroded back from the face of the brick and likely beyond the depth of the original joint. Multiple original window and door openings have been infilled with brick. It appears some of the first floor and second floor window and door lintels have been repaired or replaced at some time since the original

construction. However, it appears most of the third-floor window lintels have signs of pack-rusting and deterioration. Pack rust occurs when steel is exposed to water over a long time and starts to rust. The long-term rust expands and pushes against adjacent building materials. No signs of settlement cracking in the exterior walls or exposed portion of foundation of the 3-story building was observed. The only signs of brick or mortar joint cracking observed were near deteriorated window lintel bearings or near the tops of the 3-story walls at the corners or wall bump-outs. See attached Photos #1 thru #7 and #10 thru #14.

Klingner recommends repairing or replacing all pack-rusting deteriorated window lintels and tuckpointing all deteriorated brick mortar joints.

2. The east and west exterior walls of the 3-story school building showed signs of bowing and leaning out starting near the third-floor ceiling elevation going up. This elevation is similar to where the interior load-bearing brick walls that run at third points in the east west direction stop and where the 2-story additions on the east and west side of the original school building have their roofs and top of walls tie in. There is more wall bowing and leaning on the east wall than the west wall. See attached Photos #3, #5, #7, and #10 thru #14.

Klingner recommends partial demolition and rebuild of the top of the east wall and parapet. While rebuilding the top of east wall Klingner recommends considering not putting back the decorative terra cotta cantilever strip portions of wall and only using brick or cmu block with brick veneer. The terra cotta can be reinstalled if proper reinforcement is provided, but this would be more costly. Klingner also recommends using tie-back anchors to secure the east exterior wall back to adequately braced and blocked roof framing. For the west exterior wall Klingner is Not currently recommending partial demolition or rebuilding of the top of the west wall or parapet, but Klingner does recommend using tie-back anchors to secure the west exterior wall back to adequately braced and blocked roof framing.

3. While the focus of the evaluation was on the original 3-story school building, we also observed a few locations of exterior wall deterioration on the 2-story east building addition. Two exterior wall door openings on the first floor near the south-west portion of the east building had lintels with pack-rusting deterioration that had cracked the brick veneer at each end of the lintel bearing. Similarly, there is a large lintel beam for an opening on the west side of the roof-top screen wall that surrounds the east addition roof top equipment that has severe pack-rust deterioration and brick veneer deterioration at the lintel bearing. The upper courses of concrete masonry unit (cmu) block and brick veneer of the east roof-top screen walls have mortar joint cracking that stair steps near the wall corners and lintels bearings. See attached Photos #8 thru #9 and #24 thru #25.

Klingner recommends repairing or replacing all pack-rusting deteriorated door opening lintels in the east addition exterior walls and roof top screen wall and tuckpointing all deteriorated brick and cmu mortar joints. Klingner recommends using galvanized steel lintels if replacing the door lintels to prevent future pack-rusting deterioration.

4. The exterior walls parapets of the original 1913 3-story school building are made up of multi-wythe brick parapets with portions of large terra cotta decorative block strips cantilevered out on the exterior side of the parapets. The parapets have a terra cotta cap stone. The top of parapet height above the roof line ranges from 3'-0" to 6'-6" above the roof level. The roof membrane flashes into the lowest course of brick exposed above the roof membrane and ballast and the flashing steps down to approximately follow the slope of the roof line. The inside face of parapet appears to have been coated and painted to attempt to prevent moisture infiltration of the parapet. However, the coating and paint on the inside portion of parapet is deteriorated and missing in numerous locations and appears to be allowing moisture to penetrate the parapet walls. Moisture damage to the drywall near the top of wall or ceiling tiles near the exterior wall in multiple third floor classrooms was observed. The deterioration of the paint and moisture coating appears to be the worst near the roof drain scuppers on the north parapet. Cracks were observed on the interior side of the north-east and north-west parapet corners. The north-east parapet corner cracks were larger than the north-west parapet corner cracks. The parapets are leaning outward and bowing outward in multiple locations. The worst of the parapet bowing and leaning observed was along the east parapet and specifically the north end and corner of the east parapet. The west and north wall parapet bowed outward near the quarter points. The south wall parapet was the shortest parapet and showed the least signs of leaning or bowing. See attached Photos #1 thru #7, #10 thru #23, and #34.

Similar to exterior wall Observation #2 above, Klingner recommends partial demolition and rebuild of the top of the east wall and parapet. While rebuilding the top of east wall Klingner recommends considering not putting back the decorative terra cotta cantilever strip portions of wall and only using brick or cmu block with brick veneer. The terra cotta can be reinstalled if proper reinforcement is provided, but this would be more costly. Klingner also recommends using tie-back anchors on both the east exterior wall and west exterior wall to tie the walls back to adequately braced and blocked roof framing.

Attic Space:

1. The timber roof framing of the original 3-story school building runs in the north south direction and is supported by load bearing interior brick walls at 1/3 points and is pocketed into and supported by the north and south exterior load bearing brick wall. The top of the interior load bearing brick walls stops at the third-floor ceiling level and a short wood stud wall is built up above the brick walls to support the roof joists and built-up truss top chords. The attic space height is limited and gets smaller as the roof slopes down to the north. The roof decking and framing was observed to not be attached or tied to the east and west walls or parapets. A gap between the east-most roof framing and wood decking and the interior face of wall was observed and measured to be up to 3 1/2" near the middle of the east wall. The wood deck and the roof framing that was pocketed into the north and south exterior walls had portions with signs of water deterioration. A few locations of pocketed roof framing on the south end were observed to have steel straps or shims added in an attempt to prevent the wood framing from pulling out of the pocket. While water damage near the bearing pockets was observed in the south wall it was worse in the north wall, especially near the roof drain scupper penetrations. Previous attempts to sister some of the water deteriorated roof joists was observed near the north wall bearing. See attached Photos #26 thru #33.

See similar recommendations for exterior wall Observation #2 and exterior parapet Observation #4 above. Additionally, Klingner recommends securing the pocketed connections of the north and south wall roof framing with straps or brackets to prevent future pull-out of the pockets. Klingner also recommends replacing or repairing any water deteriorated portions of roof framing. Klingner also recommends replacing the waterproofing on the interior side of the roof parapets.

The observations above are limited to what was visible at the time of inspection. While there were enough accessible or uncovered portions of the exterior walls, parapets, interior load bearing walls, roof and floor framing, and lintels to view the typical conditions of the structural support members, the possibility exists of areas of structural deficiencies that were covered up or were not identifiable during our visual inspection.

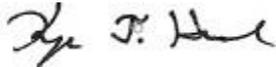
In our professional opinion, due to the potential safety hazard for anyone using or occupying the space above, below, or adjacent to the east exterior wall and parapet of the original 3-story school building, Klingner recommends the Decatur Public School District continue to restrict access to the east portions of the original 3-story Kaleidoscope school building along with the adjacent 2-story connecting portion of the east addition and the exterior areas surrounding the east portion of the original 3-story school building until further stabilization, repairs, or replacement of the upper walls and parapets can be completed.

The Klingner recommendations above are assuming the Kaleidoscope building is going to be repaired and stabilized for continued use as an elementary school building in the future. If the Decatur School District elects to stop using, partial or fully demolition, sell, or replace this school building with a new school building then the recommendations above may not be necessary if the building and surroundings can stay unoccupied until demolition or sale.

As always, if you have any questions, please do not hesitate to contact us.

Sincerely,

KLINGNER & ASSOCIATES, P.C.



Kyle T. Hannel, P.E., C.W.I.



Alan D. Lukens, P.E., S.E.

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C: Kent Metzger, Dir. Of Buildings and Grounds

Enclosure: Photos #1 thru #34;
Attachment #1 (Building Section);
Attachment #2 (Parapet Detail).



Description	Photo showing north wall exterior elevation of original 3-story building. Note portions of the wall has already had previous tuck-pointing repairs.	1
Date	06/01/2023	



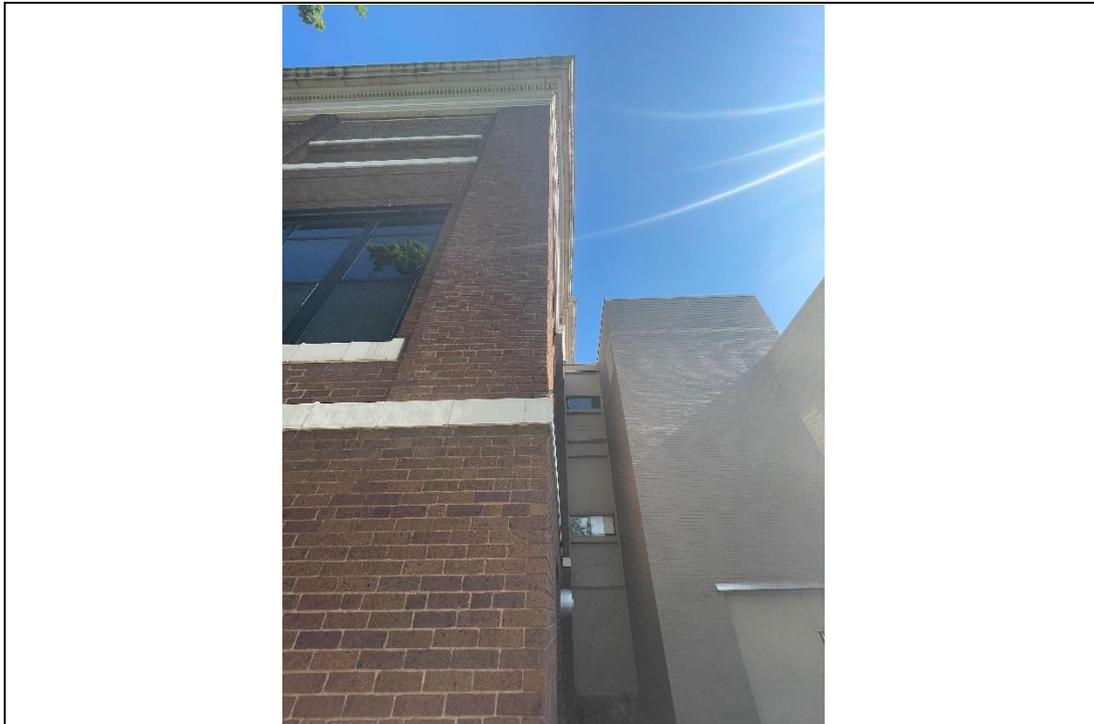
Description	Photo showing that it appears 2 nd floor window lintels have been repaired/replaced in the past but 3 rd floor lintels are pack-rusting and have not been repaired/replaced.	2
Date	06/01/2023	



Description	Photo showing north-east corner of exterior side of parapet showing the bow in the top of wall and the separation and displacements of the terra cotta decorative overhang blocks.	3
Date	06/01/2023	



Description	Photo showing that it appears 2 nd floor window lintels have been repaired/replaced in the past but 3 rd floor lintels are pack-rusting and have not been repaired/replaced.	4
Date	06/01/2023	



Description	Photo showing south-east corner of exterior wall showing the bow in the top of wall and the separation and displacements of the terra cotta decorative overhang blocks.	5
Date	06/01/2023	



Description	Photo showing south wall exterior elevation of original 3-story building. Note portions of the upper wall and parapet has already had previous tuck-pointing repairs.	6
Date	06/01/2023	



Description	Photo showing south-east corner of exterior wall showing the bow in the top of wall and terra cotta decorative overhang blocks.	7
Date	06/01/2023	



Description	Photo showing pack-rusting lintel above an existing east addition near the south-east corner man door opening that has cracked the brick at each side of the lintel.	8
Date	06/01/2023	



Description	Photo showing pack-rusting lintel above an existing east addition near the south-east corner wall opening infill that has cracked the brick at each side of the lintel.	9
Date	06/01/2023	



Description	Photo of south end of exterior side of east parapet of original 3-story school building showing the bow in the top of wall and the separation and displacements of the terra cotta decorative overhang blocks.	10
Date	06/01/2023	



Description	Photo looking down exterior side of east parapet of original 3-story school building showing cracking and separation in the brick wall and terra cotta decorative blocks.	11
Date	06/01/2023	



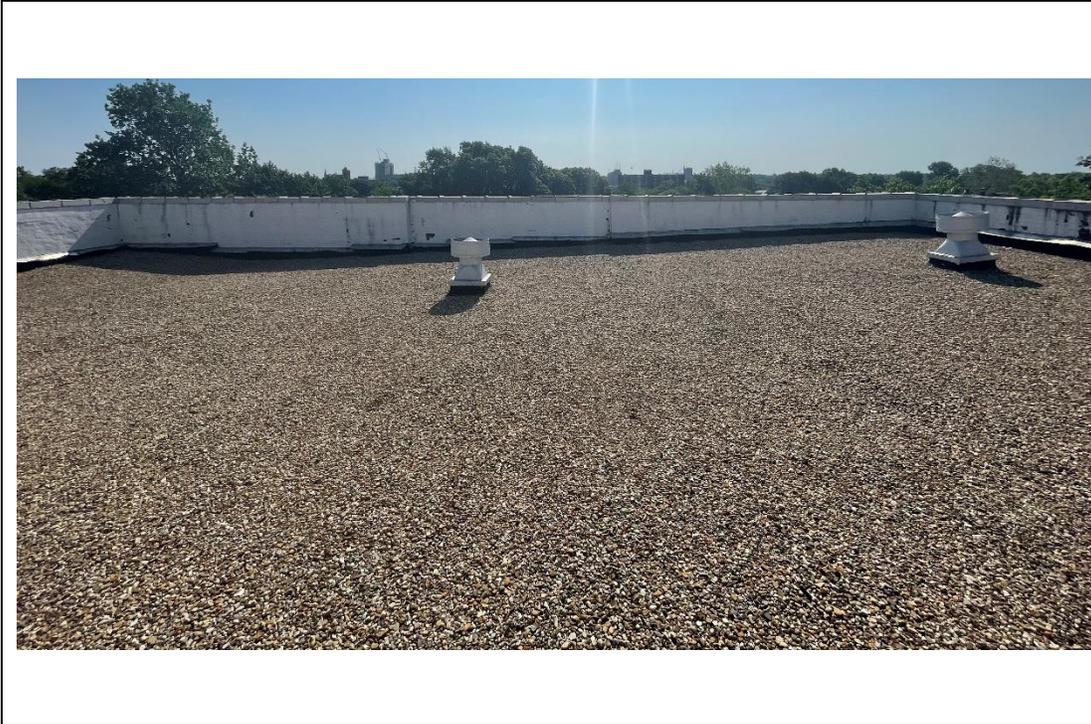
Description	Photo of north end of exterior side of east parapet of original 3-story school building showing the bow in the top of wall and the separation and displacements of the terra cotta decorative overhang blocks.	12
Date	06/01/2023	



Description	Photo looking down exterior side of east parapet of original 3-story school building showing cracking and separation in the brick wall and terra cotta decorative blocks.	13
Date	06/01/2023	



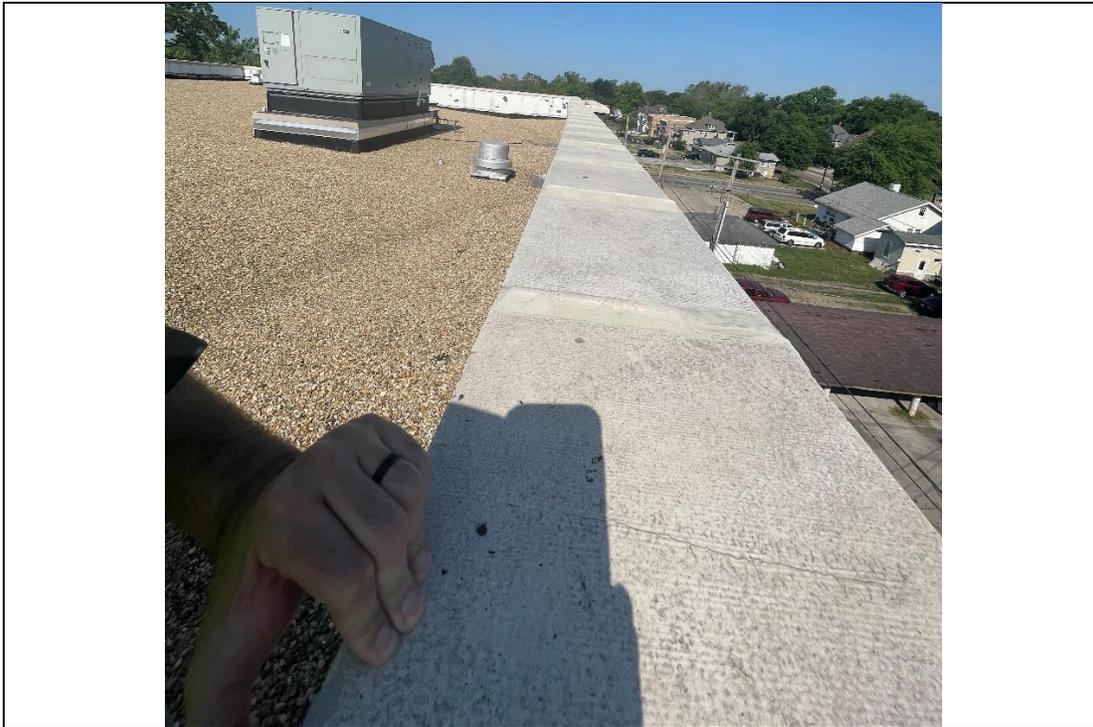
Description	Photo showing north-east corner of exterior side of parapet showing stairstep cracks in the brick wall and separation and displacements of the terra cotta decorative blocks.	14
Date	06/01/2023	



Description	Photo showing the roof of the original 3-story school building looking at the east parapet wall. Note the profile of the roof that slopes down towards the north.	15
Date	06/01/2023	



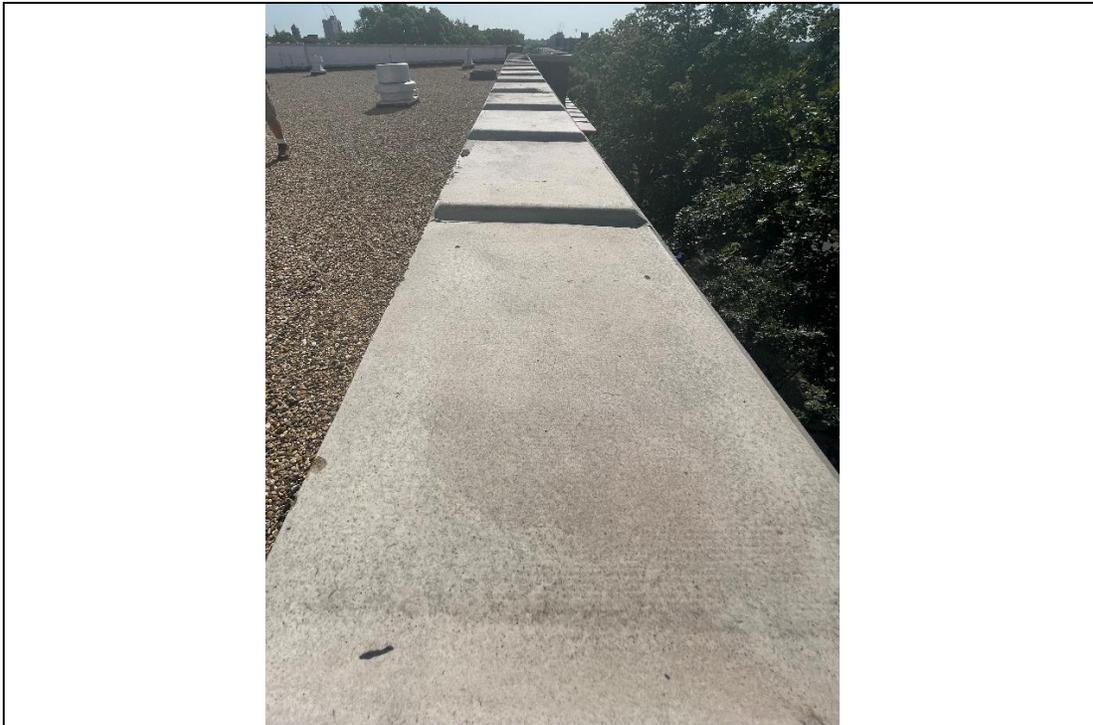
Description	Photo looking down the top of the east parapet showing the bowing out of the top of the parapet wall which is worse near the north corner.	16
Date	06/01/2023	



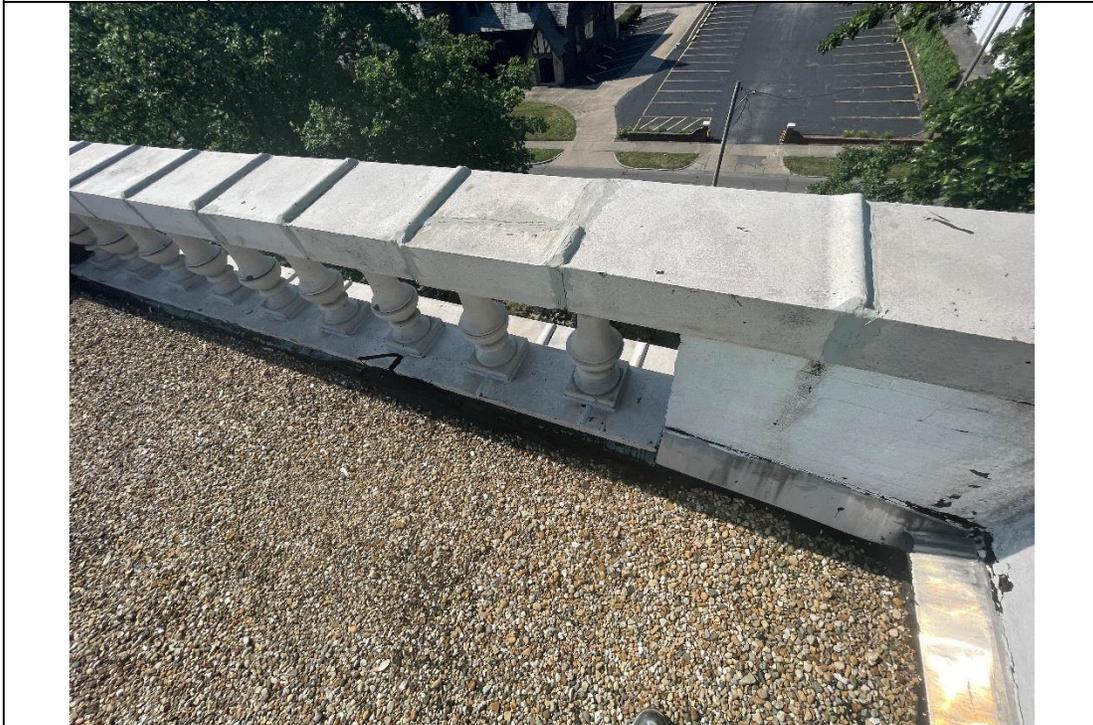
Description	Photo looking down the top of the north parapet showing the bowing out of the top of the parapet wall which is worse near the roof drain scuppers.	17
Date	06/01/2023	



Description	Photo looking down the top of the west parapet showing the bowing out of the top of the parapet wall. Note the west wall parapet bowing is not as bad as the east wall.	18
Date	06/01/2023	



Description	Photo looking down the top of the south parapet showing the bowing out of the top of the parapet wall. Note the south wall parapet bowing was less than all other walls.	19
Date	06/01/2023	



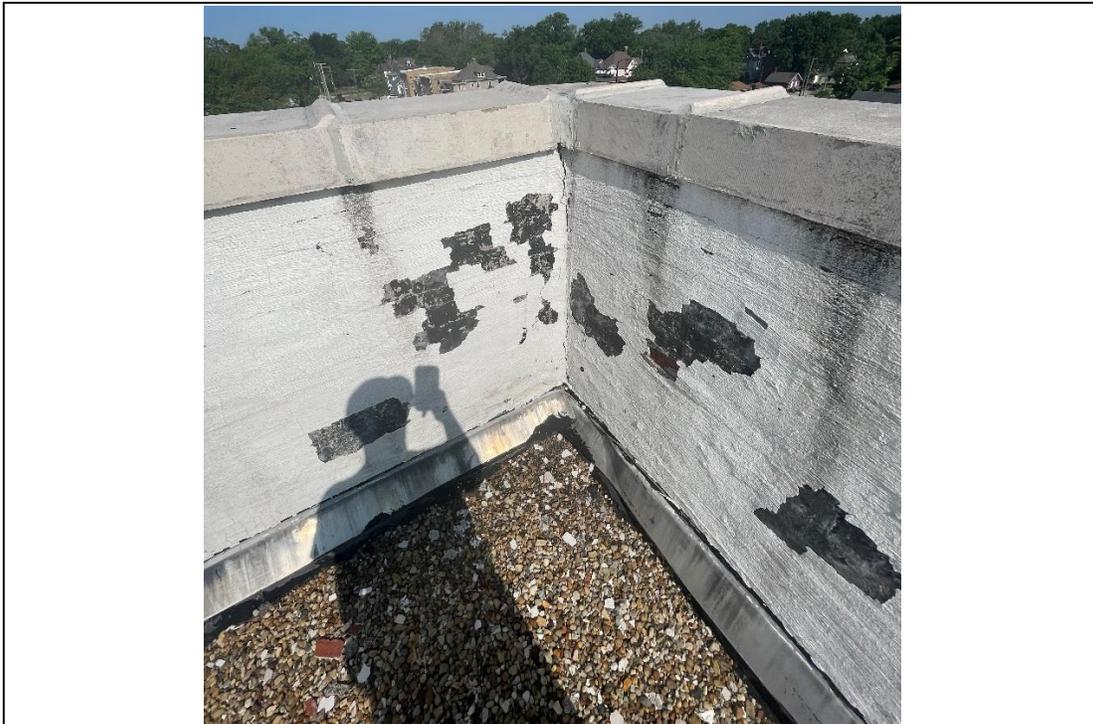
Description	Photo showing a parapet terra cotta coping piece on the south parapet that was broken and had an attempted repair.	20
Date	06/01/2023	



Description	Photo showing the interior side of the north-east parapet corner showing a crack and gap in the brick wall. The terra cotta coping joints had already had recent repair attempt.	21
Date	06/01/2023	



Description	Photo showing the deteriorated coatings on the interior side of the parapet that was worst near the north parapet scupper drain openings. Note the roof membrane only extends up a couple of brick courses, typical.	22
Date	06/01/2023	



Description	Photo showing the interior side of the north-west parapet corner showing a crack and gap in the brick wall. The terra cotta coping joints had already had recent repair attempt.	23
Date	06/01/2023	



Description	Photo showing a pack-rusted lintel beam above an opening in the screen wall that surrounds the roof top equipment above the east addition. Note the brick cracking.	24
Date	06/01/2023	



Description	Photo showing brick cracking near the top of the cmu/brick screen wall that surrounds the roof top equipment above the east addition.	25
Date	06/01/2023	



Description	Photo looking east in the attic space in the south-most roof framing bay. Note the limited attic height/space.	26
Date	06/01/2023	



Description	Photo looking west in the attic space in the north-most roof framing bay. Note the limited attic height/space.	27
Date	06/01/2023	



Description	Photo looking east in the attic space in the middle roof framing bay. Note the limited attic height/space.	28
Date	06/01/2023	



Description	Photo in the attic space showing the roof joists pocketed into the brick wall of the south wall. Note a few joists at steel straps/shims added previously.	29
Date	06/01/2023	



Description	Photo looking north along the east wall showing deteriorated roof joists and split wood decking members.	30
Date	06/01/2023	



Description	Photo in the attic looking at the current separation (measured in the range of 3 1/2") between the interior face of brick wall and the edge of roof joist and roof decking. Note that nothing ties the roof decking or joists to the east wall.	31
Date	06/01/2023	



Description	Photo in the attic space showing the roof joists pocketed into the brick wall of the north wall. Note the water damage deterioration of the joists/decking and previous sister repairs	32
Date	06/01/2023	



Description	Photo along the east wall in the ceiling space of the 3 rd floor showing a portion of exposed interior face of wall with unbonded mortar joints in the block and bricks.	33
Date	06/01/2023	



Description	Photo showing a water damaged drywall portion of top of wall of an exterior wall of the 3 rd floor. Likely means water is penetrating into the exterior walls at the roof or parapet.	34
Date	06/01/2023	

