

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 Mosaic School Building at 1499 W. Main St. in Decatur, Illinois.

Dear Dr. Curry:

On June 1, 2023, we performed a visual structural evaluation of the Mosaic School Building at 1499 W. Main St. in Decatur, Illinois. We were informed that there were recent concerns with the structural integrity of the north multi-story main-entrance stairs, so the focus of our inspection and evaluation was limited to this north stair area of the Mosaic School building. The original 2-story portion of this school building was likely built in 1920's and was named Dennis School. A 2-story addition was added to the east side of the building in 1927 and a 2-story addition was added to the south side of the school in the 1970s. 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. The Decatur Public School District had recently posted signage on the entrance doors of the Mosaic school building to restrict access to the building entrance at the stair at the time of our inspection. Access to the building and the different rooms and areas near the north main-entrance stair was provided to us by the Decatur Public School maintenance personnel that escorted us during our inspection.

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

**Foundation:**

1. Prior to our site visit, previous concerns of the basement slab and foundation had led to others drilling two small exploratory holes in the basement floor slab below the lowest portion of the north stair. We were informed that when the holes were drilled that only the top 1" to 1 ½" portion of slab felt like hardened concrete. It could still be observed in the drilled holes that below the top approximately 1 ½" of slab the material was soft and appeared to be deteriorated concrete or sandy material. While the existing original plans provided did not label the thickness of basement slab on grade, it is more typical for a basement slab to be 4" to 5" in thickness. The existing plans and observed layout of the stair appears to have the bottom end of the lowest level of stair bearing on a vestibule foundation wall

with a footing below. Therefore, it is unlikely that any of the structural concerns related to the north stair is related to the deteriorated basement floor slab.

### **Stair and Landing Superstructure:**

1. The stair flight of the north stair that runs from the vestibule level up to the 1<sup>st</sup> floor level is approximately 13'-6" wide with a handrail in the middle of the stair. The stringers are constructed out of notched out 2x12 timber members. Excessive permanent deflection was observed on this stair flight with gaps between the wall closed stringer and the wall mounted trim. The gap was up to 1" at the middle of the stringer span of the west side and up to 1/2" at the middle of the stringer span of the east side. At one accessible portion below the west side of this flight of stair we observed previous attempts to repair some of the stair stringers using a sistered 2x4 or a sistered ripped down 2x12 stringer over a portion of the original stringers. It also appeared that an 8" steel W-beam was added at some time in the past was pocketed into and added brick support pedestals on the east and west ends. The steel beam and brick pedestals were likely not original to the building and were likely added at some time in the past to help support the header at the top of the lower stair and north end of the 1<sup>st</sup> floor landing joists. See attached Photos #1 thru #5.

**Klingner recommends replacing or repairing the stair flight that runs from vestibule level up to the 1<sup>st</sup> floor level. If repairing, we recommend the stairs be raised to the original elevation and either additional supports be added below to support the stringers at their mid-span or adequately sistering each of the stair stringers. We do not recommend use the basement slab to help support any stair repairs or replacements.**

2. The multi-wythe brick walls on the east and west side of the vestibule and lower stair segment had portions of brick wall that had been removed for duct penetrations and cable penetrations. The larger duct penetrations appeared to have a header plate added to help support the brick wall portion above but the small single brick removals for cables did not. Some stair-step cracking extending off the ends of the brick openings and down to the existing brick wall door openings were observed. However, major signs of settlement or brick wall deterioration was not observed and it is unlikely that any of the structural concerns related to the north stair is related to the minor interior brick wall deterioration observed. See attached Photos #6 and #7.
3. The two (2) timber column supports at the 1<sup>st</sup> floor landing that support the 2<sup>nd</sup> floor landing and stringer bearing are leaning or deflecting excessively in the north/south direction. It appears as if these two (2) columns are approximately 6x6 timber posts and were likely not original to the design of the stair and support system because they are not in the original plans or on the other middle stair

landing level that has similar short guardrail posts. It is possible that the columns were added at some time in the past as a repair attempt for the 2<sup>nd</sup> floor landing support header above. The columns are out of plumb excessively by approximately 2° in the north-south direction above the guardrail posts and do not appear to be adequately spliced or fixed to the guardrail portion of post below the column. The bottom guardrail post portion of column has 1x boards and trim surrounding the likely 6x6 timber post member that have splits and gaps running vertically on the east and west sides. The splits and gaps of the west column guardrail post surround is larger than the east column guardrail post surround. See Photos #8 thru #10 and #12.

**Klingner recommends replacing or repairing the 2<sup>nd</sup> floor landing header and sizing the new or repaired header strong enough to allow for the removal of the two (2) existing column supports above the 1<sup>st</sup> floor landing top of guardrail post and below the 2<sup>nd</sup> floor landing header. We recommend temporarily shoring and raising the landing back up to the original 2<sup>nd</sup> floor level until the header can be replaced or repaired. We also recommend repairing or replacing the 1<sup>st</sup> floor landing guardrail post after column supports are removed.**

4. The bottom side of the east and west stair flight that runs from the 1<sup>st</sup> floor up to the middle landing was covered by plaster and lath. The plaster was missing and heavily cracked in areas below the east and west stair flight which is likely a sign of excessive deflections of the stair stringers or stringer header supports in the past. See attached Photo #11.

**Klingner recommends replacing or repairing the east and west stair flight that runs from 1<sup>st</sup> floor level to the middle landing. If repairing, we recommend the stairs be raised to the original elevation and adequately sistering each of the stair stringers. We also recommend replacing or repairing the middle landing header.**

5. The 2<sup>nd</sup> floor landing header appeared to be a 3x14 timber member that spanned from east to west wall and was supported by the two (2) column supports below. In an accessible portion of the west end of header it appeared that the header was notched out for each of the 2<sup>nd</sup> floor joists that pocketed into the header with only the bottom 2" of header appearing to be continuous along the span of the header. This 2<sup>nd</sup> floor landing appears to deflect excessively, which may have been the reason why the column supports were likely added below it in the past. Even with the columns below, the header support on the north end of the 2<sup>nd</sup> floor landing appears to be inadequate. See the attached Photos #12 and #13.

**See similar recommendations for Observation #3 above. Additionally, due to the similar size, span, and construction type of the stair flight that runs**

**from the middle landing up to the 2<sup>nd</sup> floor landing level, Klingner recommends replacing or repairing the stair flight. If repairing, Klingner recommends the stairs be raised to the original elevation and adequately sistering each of the stair stringers.**

6. The east and west portions of upper stair flight are each approximately 5'-0" wide and run from the 2<sup>nd</sup> floor level up to the upper level that is slightly above the 2<sup>nd</sup> floor level. The upper level and both of these upper stair and stair landings have excessive deflection towards the middle of the stairwell or middle of header and upper-level floor joist span. The upper stair and stair landings are permanently deflecting at an approximately 2° slope and the doors leading to the room and staff restroom on the north end of the upper landings are out of plumb so much that someone has had to cut the door down to reduce the door height by up to 1" on the non-hinge side of the doors to allow the doors to be able to swing open. The wall on the south side of the upper landing is also deflecting near the mid-span and the wall plaster is cracking and the decorative wood trim along the base of the wall is splitting. While the upper-level framing spans in the east/west direction, with no column supports below the existing header that is located at the south end of the upper level, it appears the upper-level south header is inadequate to support the stair landings and the wall above it. See attached Photos #14 thru #17.

**Klingner recommends replacing or repairing the upper landing header and raising the upper landing level and wall to the original elevation. We also recommend replacing or repairing the east and west stair flight and landing that runs from the 2<sup>nd</sup> floor level to the upper landing. If repairing, we recommend the stairs and landing be raised to the original elevation and adequately sistering each of the stair stringers. We recommend replacing the doors on the upper level after all repairs/replacement and raising has been completed.**

7. One of the exposed joists of the upper level has been notched for a previous plumbing penetration. There was also some minor existing water damage to the nearby joists and ceiling where it appeared a previous plumbing repair had been made. See attached Photo #18.

The observations above are limited to what was visible at the time of inspection. While there were enough accessible or uncovered portions of the support walls, landing framing, stair stringers, and headers 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.

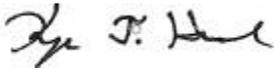
**In our professional opinion, due to the potential safety hazard for anyone using or occupying the space above or below the north multi-story stair and stair**

**landings, Klingner recommends the Decatur Public School District continue to restrict access to the Mosaic building north multi-story stair and areas below, above, and adjacent to the stair until further stabilization, repairs, or replacement of the stair can be completed. Before any staff is allowed to access the interior portions of the school outside of the north stair area, we recommend a code study be completed for the building to verify if there would be safe emergency exit access locations for the staff while the north stair is inaccessible or until the north stair has been fully repaired or replaced.**

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

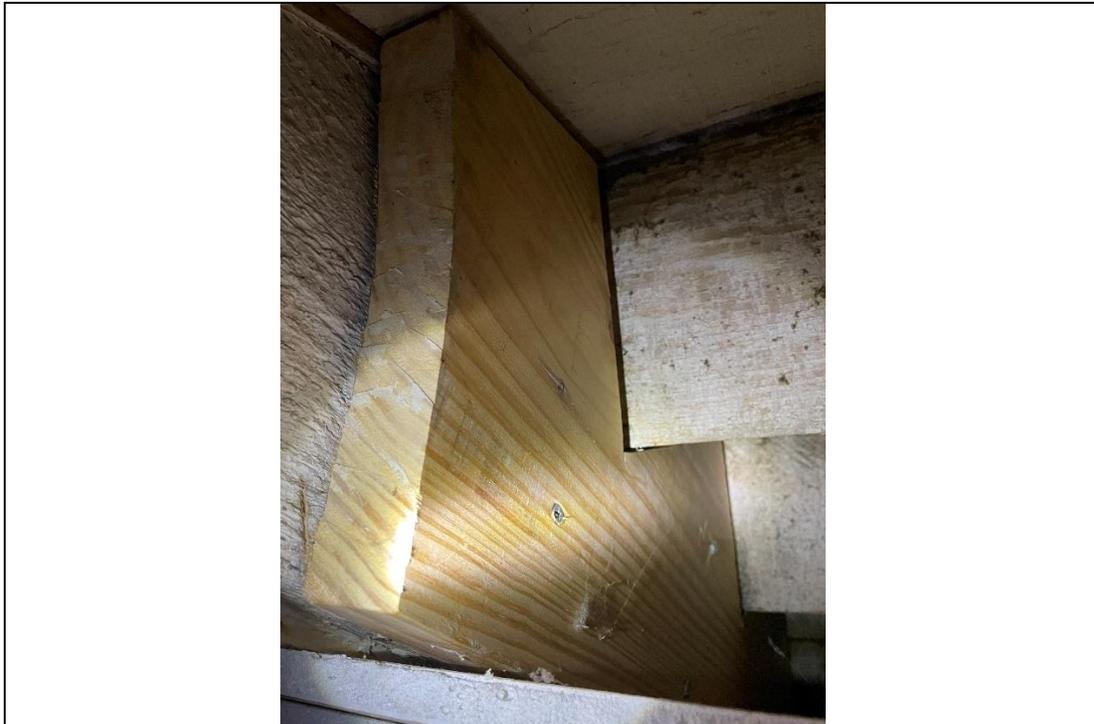
Enclosure: Photos #1 thru #18;  
Attachment #1 (Partial Building Section)



Description	Photo of the stair leading from vestibule up to first floor level looking west showing the sag in the stair from the gap between the wall closed stringer and wall mounted trim.	<b>1</b>
Date	06/01/2023	



Description	Photo of the stair leading from vestibule up to first floor level looking east showing the sag in the stair from the gap between the wall closed stringer and wall mounted trim.	<b>2</b>
Date	06/01/2023	



Description	Photo of a previous attempted repair to a stair stringer for the stair leading from vestibule up to first floor level near the west side of the stair.	<b>3</b>
Date	06/01/2023	



Description	Photo of a previous attempted repair to stair stringers for the stair leading from vestibule up to first floor level near the west side of the stair.	<b>4</b>
Date	06/01/2023	



Description	Photo of an 8" steel beam that sits just below the upper end of the stringers for the stair leading from vestibule up to first floor level. This beam was likely added as a repair attempt sometime after the original construction.	5
Date	06/01/2023	



Description	Photo of a vestibule wall near the corner of a man door opening that has had bricks removed to run a cable thru the multi-wythe brick wall. Brick crack steps down at edge.	6
Date	06/01/2023	



Description	Photo of a vestibule wall above a mandoor opening that has been sawcut and had bricks removed to run duct work thru the multi-wythe brick wall.	<b>7</b>
Date	06/01/2023	



Description	Photo looking at east column on the 1 <sup>st</sup> floor landing that is supporting the 2 <sup>nd</sup> floor above. Note the columns are out of plumb approximately 2° in the north/south direction and appears to start deflecting just above the top of guardrail.	<b>8</b>
Date	06/01/2023	



Description	Photo looking at west column at the 1 <sup>st</sup> floor landing. Note the 1x boards and trim surrounding the wood columns are split and gapped up to 1/2" from the column deflection.	<b>9</b>
Date	06/01/2023	



Description	Photo looking at east column at the 1 <sup>st</sup> floor landing. Note the 1x boards and trim surrounding the wood columns have multiple splits and gaps from the column deflection/kick out.	<b>10</b>
Date	06/01/2023	



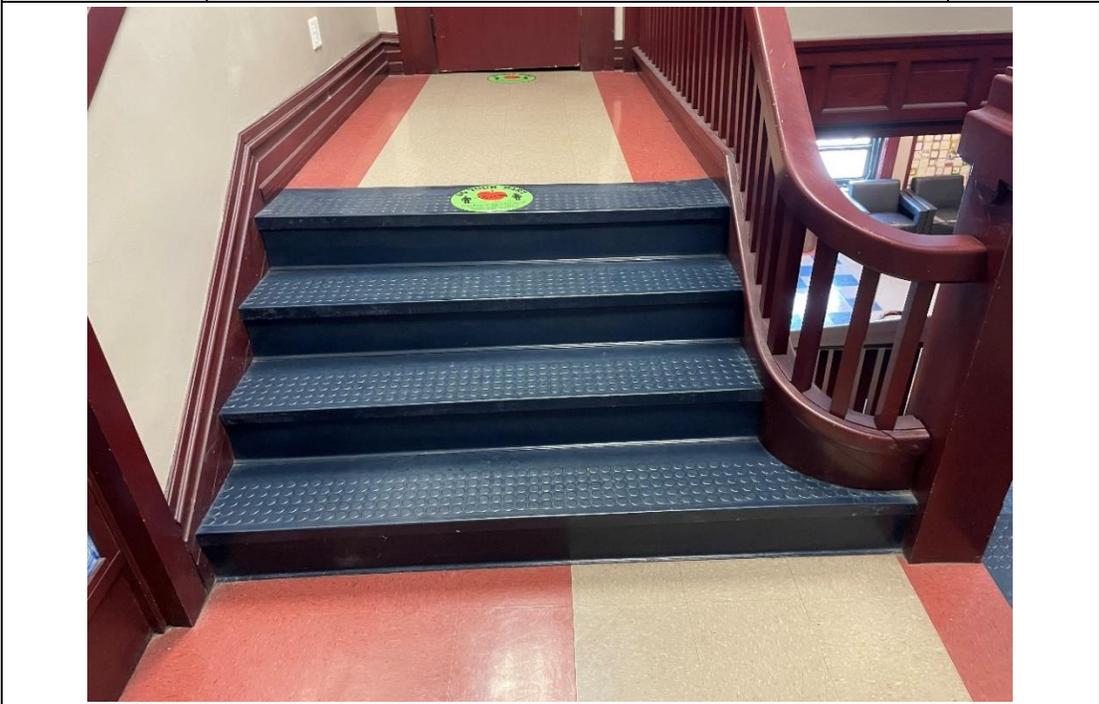
Description	Photo looking at the bottom side of the stairs that run from 1 <sup>st</sup> floor up to the middle landing. Note the plaster board cracking below the stair likely from the deflection of the stair stringers.	<b>11</b>
Date	06/01/2023	



Description	Photo looking at the 2 <sup>nd</sup> floor landing and at the small stair that leads to the upper level. Note the deflection of the stair and header that supports the bottom of the upper stair.	<b>12</b>
Date	06/01/2023	



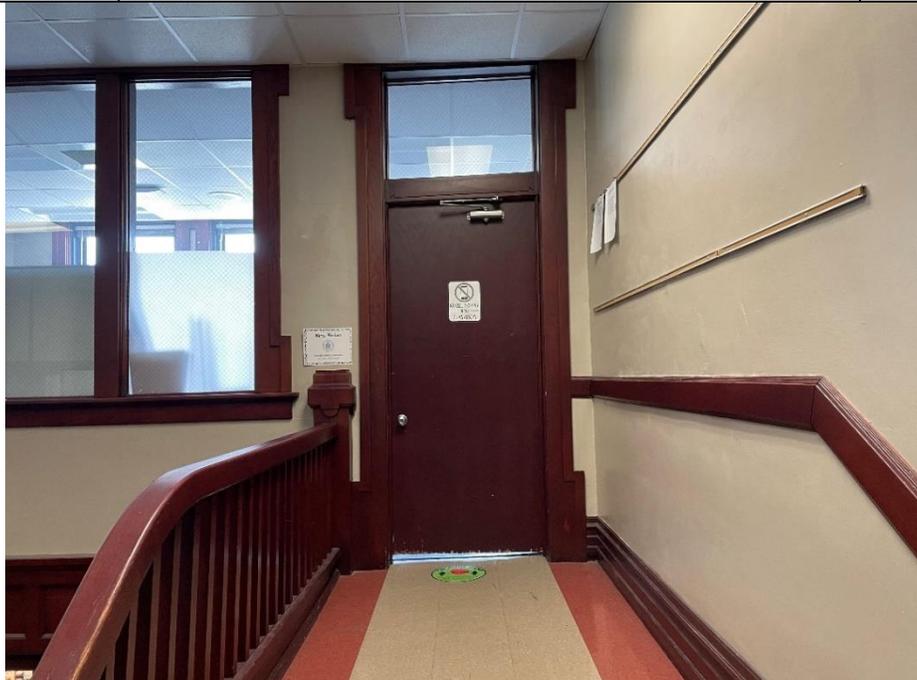
Description	Photo looking at the 2 <sup>nd</sup> floor header that supports the bottom of the stair from the upper level. Note the header was notched out for the 2 <sup>nd</sup> floor joists leaving only 2" of wood header member below each joist notch.	<b>13</b>
Date	06/01/2023	



Description	Photo looking at the west small stair that leads to the upper level. Note the stair and landing deflects down 2° towards the east (right of photo) and the door beyond has been trimmed 1" to open.	<b>14</b>
Date	06/01/2023	



Description	Photo looking at the east small stair that leads to the upper level. Note the stair and landing deflects down 2° towards the west (left of photo) and the door beyond has been trimmed 1" to open.	<b>15</b>
Date	06/01/2023	



Description	Photo looking at the upper-level landing of the east small stair. Note how out of plumb the door and window above are and that the door has been trimmed down 1" to open.	<b>16</b>
Date	06/01/2023	



Description	Photo looking at the wall on the upper level between the upper-level stair landings. Note the wall plaster cracks and wall trim cracks from the excessive deflections of the wall.	17
Date	06/01/2023	



Description	Photo showing a previous notch cut out of one of the upper-level floor joists for plumbing penetration. Note this portion of ceiling appears to have been previously opened up to fix a plumbing pipe leak in the floor of the upper level.	18
Date	06/01/2023	

