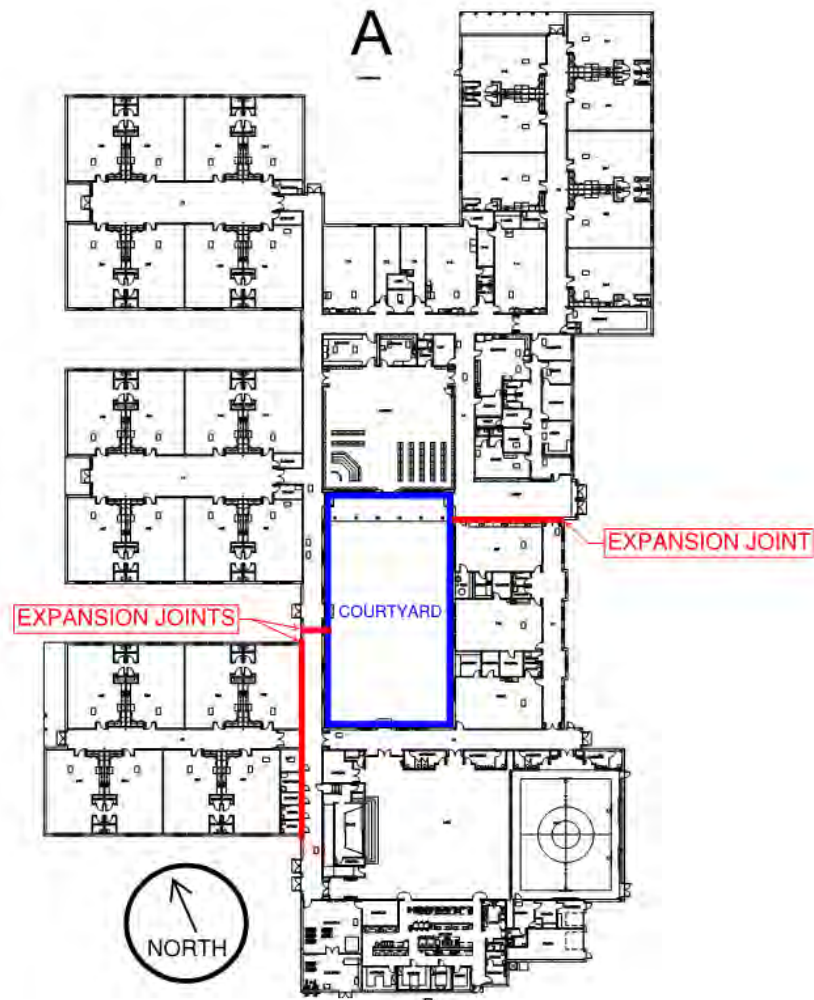


STRUCTURAL ASSESSMENT – Perez ES – Main School Building (BLDG-190A)

Building Purpose	Cafeteria, Gym, Admin, Classrooms, Library
Inspection Date	October 25, 2016 (Morning)
Inspection Conditions	75° - Cloudy and Dry

Building Description / Reported Structural Concern

Brief Description of Existing Structure: The building foundation consists of grade beams and slab-on-grade, with straight-shaft drilled piers below concentrated column loads. The superstructure consists of conventionally framed structural steel. The building is separated by three expansion joints: the first isolates the 500 classroom wing, the second runs across the hallway just west of the courtyard, and the third joint is located to the east of the courtyard and runs towards the main entrance of the school. The expansion joints divide the building into three isolated structures.

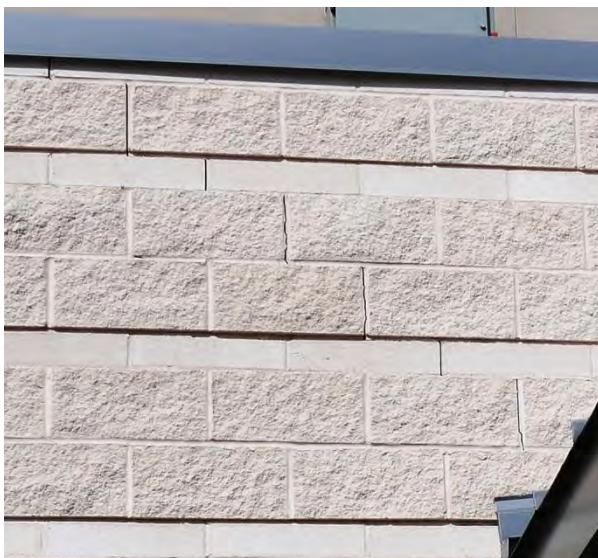
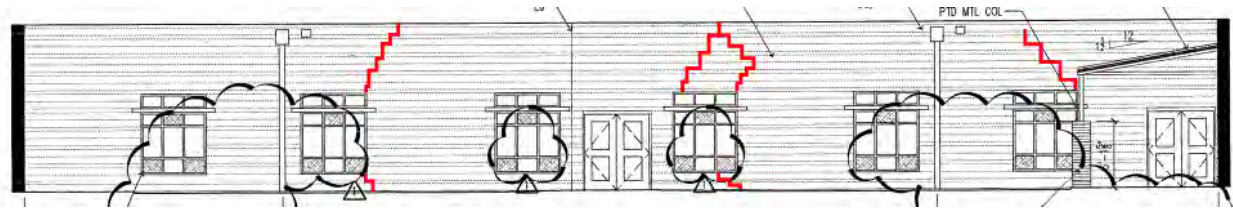


Reported Structural Concern: A large crack in the exterior brick veneer was reported on the west side of the interior courtyard.

Structural Assessment Site Observations

While at the facility we made the following observations:

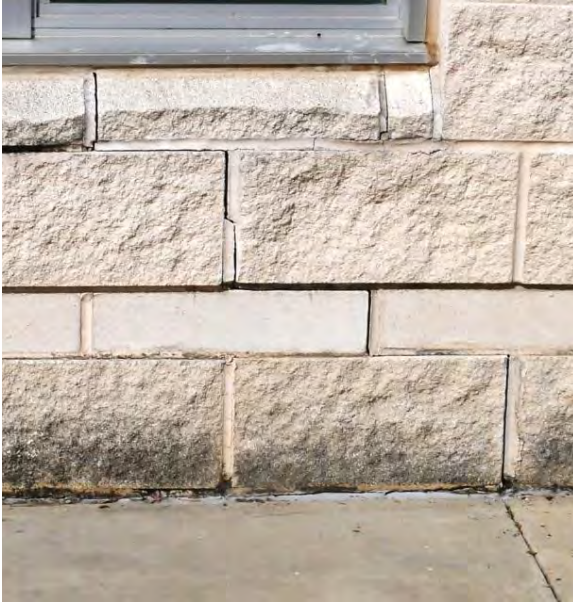
- **West Courtyard Exterior Masonry Veneer:** Multiple cracks were observed on the west wall of the courtyard. The cracks are located above and below three different windows. The expansion joint is located just south of the door near the center of the courtyard west wall. Separation was observed at the top of the expansion joint from both the interior and exterior of the wall. The cracks typically ran along the mortar joints of the masonry wall. The figure below shows the approximate locations and shapes of the cracks in red.



Diagonal crack near north end of wall



Diagonal crack over window on north side of door



Crack under window

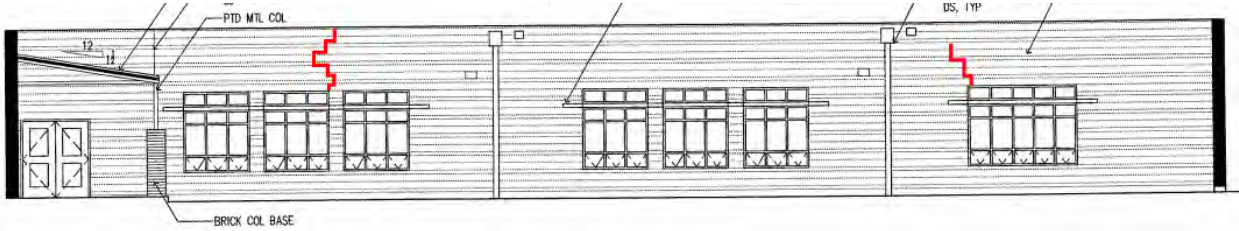


Separation at expansion joint



Separation at expansion joint

- **East Courtyard Masonry Wall:** Two smaller cracks were observed on the east wall above two different windows. The figure below shows approximate locations and shapes of the cracks in red.



Crack over window



Crack over window

- **Interior Floor:** Cracked floor tiles were observed in front of the west library entrance door and a couple of feet away from the door at intersection of the interior hallways. Both cracks run in the north-south direction.



Cracked floor tiles near west library door

Conclusions

The wall cracks on the east and west sides of the courtyard occur where the building has the least amount of width and is therefore more flexible than the wider building widths to the north and south of the courtyard. These more flexible building area are where we would expect cracks to develop due to soil movement. It is unclear whether the wall and floor cracks are due to initial building pad settlement or expansive/contractive movement of the clay soils below the building. Typically soil settlement occurs in the years immediately following construction, so if it is the cause of the damage, more settlement is unlikely to occur and the cracks will not worsen and propagate over time. However, if they are due to soil expansion and contraction then the cracks will open and close as the moisture content in the soil changes and over time the damage will worsen.

In order to determine whether the damage is due to settlement or expansive/contractive soil movement, the cracks should be monitored for one to two years before they are repaired. If the cracks show no change over the monitored time period then it is likely that one-time settlement is the cause of the cracks. If the cracks lengthen, widen or propagate over the monitored time period then the likely cause of the damage is expansion and contraction of the in-situ clay soils. Repair recommendations will vary slightly depending on the source of the damage.

Note: This report is based on and limited to the observations and information noted above. This is not a guarantee. Additional deficiencies may exist which were not observed and which may require additional remedial work which is not listed here.

Perez ES – Summary of Structural Repair Recommendations

This document is based on current conditions observed during fieldwork and provides recommendations for corrective actions.

Main School Building Structural Repair Recommendations

Note that any repair of the masonry wall finishes and/or floor finishes is not required structurally.

- 1) Monitor crack patterns, lengths and widths for one to two years to understand whether cracks are worsening over time.
- 2) If cracks show no sign of change over the monitoring period, then the wall cracks may be repaired by replacing any badly cracked or damaged masonry blocks and repointing the mortar joints. If desired, the cracked floor tiles can be replaced.
- 3) If cracks lengthen, widen or propagate over the monitored period, then these additional measures are recommended:
 - i. Re-grade the site so that water drains away from the building and implement drainage measures so that surface water is collected quickly before soaking into the soils.
 - ii. Add additional control joints at corners of windows and doors and seal with a flexible sealant so the masonry veneer can accommodate soil movements without causing damage.