

Swift Creek Elementary School

Structural Narrative

Prepared by: Lynch Mykins Structural Engineers

SCOPE AND BACKGROUND

We visited the existing Swift Creek Elementary school site and buildings located at 5601 Tryon Road in Raleigh on April 1, 2021 to observe the existing condition of the building structures and provide recommendations regarding either renovation and addition or complete demolition of the existing buildings to make way for a new school constructed on the same site. We also reviewed the limited available existing building structural drawings. The existing campus consists of multiple buildings that have been constructed at different times, which consist of a gymnasium constructed in approximately 1957, a single-story classroom building constructed in approximately 1972 and a two-story classroom building constructed in approximately 1992. It appears that two earlier classroom buildings that existed on the site previously have been demolished.

GYMNASIUM STRUCTURAL NARRATIVE

The building structure consists of load bearing concrete masonry exterior walls supporting a steel joist roof with a cementitious roof deck. The walls have some moderate areas of cracking likely due to differential foundation settlement which is likely at least partially the result of the grade and water around the building foundations. There is some observed cracking and damage to the cementitious roof panels and moderate corrosion at the roof joists in some areas. The side walls of the gymnasium have upper level ribbon windows with only brick pier elements extending between the windows to support the bar joists. These appear to be constructed only with brick as visible from both the interior and exterior and as such, may likely be unreinforced. The gymnasium floor was not visible, however, it appears to consist of a wood framed floor with masonry piers in a crawlspace.

GYMNASIUM PHOTOGRAPHS



PHOTOGRAPH 01: FRONT ENTRY ELEVATION



PHOTOGRAPH 02: SIDE ELEVATION



PHOTOGRAPH 03: REAR ELEVATION



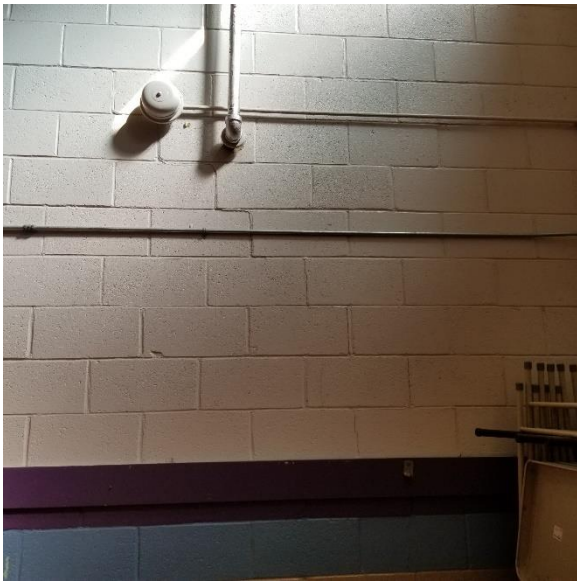
PHOTOGRAPH 04: RETAINING WALL ALONG SIDE



PHOTOGRAPH 05: CRACKING/DAMAGE TO
RETAINING WALL AT GYMNASIUM



PHOTOGRAPH 06: INTERIOR OF GYMNASIUM



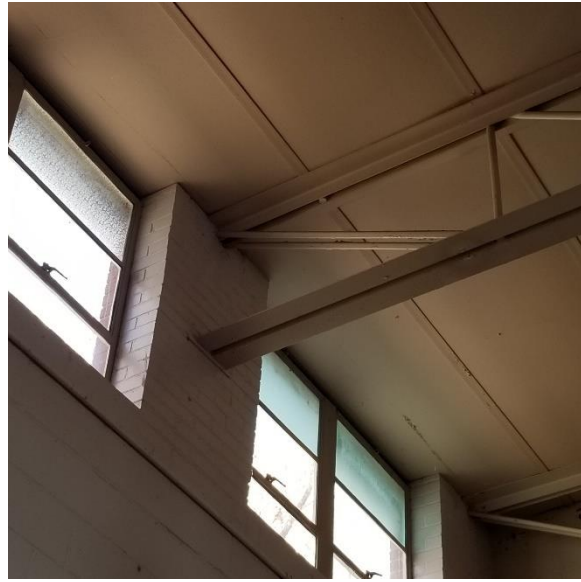
PHOTOGRAPH 07: CRACKING IN CONCRETE
MASONRY WALLS



PHOTOGRAPH 08: MODERATE CORROSION OF
ROOF BAR JOIST



PHOTOGRAPH 09: DAMAGE/CRACKING TO CEMENTITIOUS ROOF PANELS



PHOTOGRAPH 10: TYPICAL ROOF JOIST BEARING ON BRICK MASONRY PIERS BETWEEN CLERESTORY WINDOWS



PHOTOGRAPH 11: WATER INFILTRATION AND CORROSION AT WINDOW LINTELS

ONE STORY CLASSROOM BUILDING STRUCTURAL NARRATIVE

The structure is unique in that the exterior steel frame for the structure is outboard from the building exterior walls with perimeter steel beams on all four sides bearing on steel columns which in turn bear on small round concrete piers that extend above grade. The exterior walls consist of a brick veneer with a concrete masonry back up wall. It is likely that the top of these exterior walls are not adequately laterally braced into the roof structure. The expansion joints in the brick veneer have failed at many locations. The roof is framed with open web steel bar joists supporting a steel roof deck creating a low slope roof. Rather large mechanical units are present on the existing roof.

ONE-STORY CLASSROOM PHOTOGRAPHS



PHOTOGRAPH 01: END ELEVATION



PHOTOGRAPH 02: SIDE ELEVATION



PHOTOGRAPH 03: TYPICAL EXPOSED EXTERIOR
STEEL STRUCTURE



PHOTOGRAPH 04: TYPICAL STEEL COLUMN
BEARING ON CONCRETE PIER



PHOTOGRAPH 05: FAILED BRICK VEENER
EXPANSION JOINT

TWO-STORY CLASSROOM BUILDING STRUCTURAL NARRATIVE

This building is the newest structure on campus. The building appears to consist of exterior precast concrete wall panels with structural steel interior columns at the center corridor and exterior columns. The second floor system consists of a structural steel beam and concrete slab on steel deck floor system and steel joist and steel deck roof system with a stone ballasted roof. This building is also constructed at a low elevation with grade sloping down towards the building and has significant cast-in-place concrete site retaining walls. The concrete retaining walls appear to be in adequate structural condition. There is an elevated bridge structure that connects grade at the retaining wall to the upper level of the classroom building. The bridge structure appears to be in fair structural condition. There is some corrosion of steel at the building expansion joint at the bridge joint at the building. There was one expansion joint observed in the existing building which had walls and casework spanning across the joint.

TWO STORY CLASSROOM BUILDING PHOTOGRAPHS



PHOTOGRAPH 01: SIDE ELEVATION



PHOTOGRAPH 02: REAR ELEVATION



PHOTOGRAPH 03: TYPICAL WATER STAINING AT WINDOWS



PHOTOGRAPH 04: TYPICAL FAILED PRECAST SEALANT JOINTS



PHOTOGRAPH 05: STEEL CANOPY WITH EXPOSED ENDS OF HSS STEEL MEMBERS



PHOTOGRAPH 06: CONNECTOR BRIDGE



PHOTOGRAPH 07: CONNECTOR BRIDGE AT BUILDING



PHOTOGRAPH 08: CONNECTOR BRIDGE AT ABUTMENT WALL



PHOTOGRAPH 09: CORRODED STEEL AT CONNECTOR BRIDGE EXPANSION JOINT AT BUILDING (BOTTOM SIDE)



PHOTOGRAPH 10: DRAIN / EXPANSION JOINT AT BUILDING (TOP SIDE)



PHOTOGRAPH 11: FRONT ENTRY CANOPY AT
CONNECTOR BRIDGE