April 13, 2023

Report of Findings, Recommendations and Probable Cost

Re: Colusa USD District Office Building Stabilization
Colusa Unified School District
Project No.: 2023-003.00

Purpose of the Report

The existing non-reinforced brick masonry classroom building located at 745 10th Street in Colusa, California, once home to Colusa High School and now home to the Colusa Unified School District offices, has fallen into a state of disrepair and shows evidence of deterioration due to the age materials and damage as a result of water infiltration through the exterior building systems.

The purpose of this report is to identify essential exterior building systems that require maintenance or replacement to halt weather-related deterioration of the structure. Findings and recommendations are based upon first-hand observations without the benefit of any destructive examination. Issues not related to deterioration were also observed and are addressed herein. These issues represent critical code compliance deficiencies that may affect the further safe occupancy of the structure and add to the magnitude of deficiencies that require attention and the cost to address to those deficiencies.

Participants

The following individuals conducted a walk-through of the structure on March 8, 2023, making a visual examination of existing conditions, with an emphasis on interior water damage, clay tile and built-up roofing systems, exterior fenestration and trim, brick masonry, skylights, and window systems.

Jamie Lay, Director M.O.T. Colusa Unified School District
Zach Holliman, Project Manager, The Garland Company (Roofing Expert)
Brad Rollins, Structural Engineer, Point 2 Structural Engineers, Inc.
Kip Grubb, Architect, Community Architecture, Inc.

Background

Colusa Unified School District offices are located within an historic building originally constructed in 1926 as home to Colusa High School. The building is prominently featured in a Google search of Colusa, the city and is one of the most significant structures in town.

Presumably, the high school vacated the structure once the new high school campus was constructed in 1958. The district offices assumed residency sometime thereafter.

The relocation of the high school likely came about as a result of state legislation known as the Field Act, which was enacted to mandate earthquake-resistant construction for schools in California following the 1933 Long Beach earthquake. 230 school structures in Southern California were rendered unsafe as a result of the quake. The Field Act banned the use of unreinforced masonry for the construction of public schools and ultimately led to the closure of similarly constructed school buildings across the state, one of those being Colusa's historic high school building.

Unreinforced masonry buildings may be retrofitted and brought up to current code standards, however the details of construction are complex and expensive in nature. Brad Rollins, a structural engineer, has expanded upon this subject in an attachment to this report. Additionally, all other aspects of the structure would need to be brought up to current codes including accessibility upgrades, electrical systems, fire-rated construction and so forth. This process is further complicated by the absence of reliable and accurate record documents (drawings and calculations) which would greatly assist future design and engineering decisions. Since this report relies upon first-hand observations of the existing conditions, quantitative and qualitative information is approximate in nature.

The building is listed on both the State and Federal Registers of Historic Structures / Places. The historic criteria for preservation limits design solutions and typically restricts choices to use of materials and details that are consistent with the original design, which in turn adds to the cost of doing any work to rehabilitate the building. Improvements proposed or recommended in this report are intended to be consistent with the existing historic character of the building.

Findings

Brick masonry walls, consisting of two wythes of brick, with a decorative exterior brick and a concealed interior common brick, including square beveled grout, appear to be in very good condition. This is due to an air-cavity that separates the exterior and interior wythes allowing for proper separation of cold and hot surfaces which limits condensation and water penetration that can each lead to deterioration.

Clay tile roofing appears in good condition with only a small quantity of tiles noted to be broken or missing, however the water-resistant roofing substrate beneath the tiles needs to be replaced and is well beyond the expected 35-year life expectancy of the roofing substrate. Copper gutter, conductor heads and downspouts are severely rotted in certain areas and the entire gutter and downspout system should be replaced concurrent with the repairs to the clay tile roof system. Built-up roofs and associated flashing need to be removed and replaced. Skylights should be replaced or infilled with framing and roofed over if no longer desired.

The ground floor is in a good state of repair and does not present significant deterioration due to the effects of weather other than isolated plaster ceilings in the vicinity of skylights where there is evidence of water infiltration that has caused lath and plaster failures.

The second floor differs from the first floor with significant evidence of roof leaks that have caused ceiling lath and plaster failures plus incidents of plaster failure at exterior walls, particularly in the vicinity of windows. Wood windows are in extremely poor condition showing evidence of dry-rot, separation of sash and frame assemblies, broken glass and missing glazing compounds. Certain 2nd floor, East-facing windows have been removed or covered by a false window system to hide the extent of damage.

The following items, while beyond the original scope of this report, were also observed:

Termite damage was observed at the Southerly stairwell landing and treads. Linoleum flooring throughout the 2nd floor, likely installed in 1926, has failed due to age and exposure to moisture. In general, the lack of heating and ventilation systems on the second floor has led to the failure of many interior finish materials. Paint finishes are severely deteriorated throughout the second floor including ceilings, walls, cabinetry, doors, frames and wood trim. Ceiling plaster failure is on-going and may present a hazard due to falling debris. Openings in the exterior envelope have allowed entry of rodents, birds and bats with droppings being evident in numerous locations and there is evidence of mold related to moisture.

A temporary wall, door and frame have been installed at the North end of the second floor corridor, presumably to prohibit access from the 2nd floor landing at the North stairwell or from the balcony level of the Theater. A table has been observed at the bottom of the South 1st floor stairwell, to dissuade access to the 2nd floor. The Theater and balcony seating areas remain in use and rely upon the 2nd floor corridor and exit system for safe egress.

The entire 2nd floor corridor and exit system needs to be restored to meet code required separations for exiting and occupancy/fire separations. Fire-rated wall finishes, doors and door frames need to be reconstructed. Additionally, the entire building lacks a fully functioning fire-alarm system with enunciation devices, audible alarms, strobe warning lights and emergency egress illumination.

Recommendations

1. Remove existing clay roof tiles, stack, install new waterproof substrate, reinstall roof tiles, and replace gutter and downspout assemblies. Repair damaged structural sheathing, as necessary. We would further recommend adding structural plywood sheathing over the existing sheathing at this time so that this work would already be in place should any seismic upgrades be pursued. The cost to add sheathing is currently unknown since structural calculations have not yet been performed.

2. Remove and replace built-up roof systems. Including roof drain strainer and overflow assemblies. Repair damaged structural sheathing, as necessary.

3. Remove and replace second floor window systems to prevent entry of water and pests, and/or remove and replace first floor windows to replace damaged or broken windows and improve the efficiency of the ground-floor mechanical system.

4. Obtain a hazardous materials survey of materials to determine method and cost for demolition work deemed necessary. Additional testing is recommended to determine the presence of other toxins or mold that may be present as a result of moisture and vermin infiltration.

5. Remove loose ceiling and wall finishes that may pose an eminent hazard to occupants due to potential falling debris.

6. Restore the 2nd floor fire-rated exit system (rated walls and doors) in its entirety.

7. Install new fire alarm and enunciation system.

8. Install emergency egress lighting system.

Probable Costs

Description			Probable Cost
Remove and reinstall clay roof tiles and repair substrate.		=	$650,000
Replace built-up roofing and repair substrate.		=	$95,000
Replace and replicate copper gutters and downspouts.		=	$45,000
Remove/abate and replace window systems, entire building.	3,000 SF+/-	=	$750,000
Remove/abate and replace window systems, 2nd floor East.	500 SF+/-	=	$125,000
Hazmat survey / mitigation measures.	22,287 SF+/-	=	$225,000
Remove loose ceiling and wall finishes & stabilize substrate.	3,000 SF+/-	=	$120,000
Restore 2nd floor fire-rated corridor / exit system.	2,000 SF+/-	=	$500,000
New fire alarm & enunciation system.	22,287 SF+/-	=	$168,000
New emergency egress lighting system.	22,287 SF+/-	=	$90,000

Soft Costs			Probable Cost
Inspection fees	4%	=	$105,000
Design / engineering fees	12%	=	$320,000
Agency fees – DSA or Local Authority	3%	=	$80,000
Contingency (suggested higher than usual due to unknowns)	20%	=	$530,000

In closing, we appreciate the opportunity to provide this report of findings, recommendations, and probable costs. We are available to discuss further or explore other options or questions that may arise.

Prepared by,

Kip Grubb
Principal Architect C-19022

Attachments: 4/13/23 Repot of Findings, Point 2 Structural Engineers Inc.

Cc: File No. 2023-003.00 / Contract

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April 13, 2023

Report of Findings

Subject: **Colusa USD District Office**
745 10th Street
Colusa, CA
Point 2 Job No.2023-011

Please find enclosed the report of our findings for the subject project.

PROJECT SCOPE

A site visit was made on March 8, 2023, to observe, collect pictures and to get an understanding of the above referenced structure and its current condition.

This project consists of the visual evaluation of the structure to determine probable deficiencies and upgrade concepts. This document is a report from the site visit.

BACKGROUND

The structure was built in 1926 as a school building for Colusa School District. The 2 story structure has approximately 28,000 square feet of space on each floor and includes a 60' tower over the entrance. Most of the space was originally configured for classrooms and an auditorium but is used for office space on the ground floor only now. The auditorium is still used occasionally.

The exterior finish is a hard fired brick veneer over Unreinforced Masonry (URM) walls. The walls appear to be 2 and 3 wythe construction with the veneer solidly embedded into the brick wall backing.

The condition of the exterior brick veneer appears to be excellent, with only minor cracking observed in the finish as described later. For a structure of this vintage, the quality is impressive and remarkable. The mission tile also appears to be in good condition. The structure seems to have weathered the years quite well.

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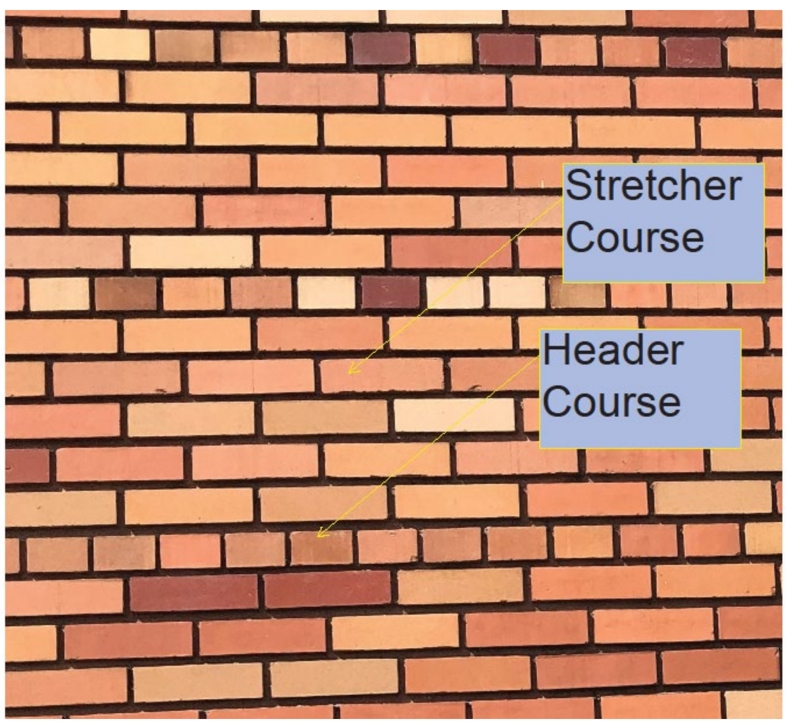
The URM building was a common construction method of the 1920's. The walls are constructed of 2 or 3 layers (wythes) of masonry brick, stacked, with mortar between the bricks in a pattern called "American Bond". The stretcher courses are typical, and they run parallel with the wall. The header courses are bricks turned inward, extend into the thickness of the wall, and are typically located at each 6th row. See the photo below:



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The existence of the header course blocks the ability to have continuous vertical gap between the wythes for grout and rebar, so it is likely that reinforcing steel is minimal or does not exist in these walls.

The floors and roof consist of wood framing that bear directly on the masonry walls. The floor joists are resting in a niche or pocket created at the floor level for each joist. The walls transfer the vertical weight and loads down to the foundation. These bearing walls extend to the footings.

The heavy mass of an URM building will develop greater forces from an earthquake due to its inertia. Because of this and the multiple brick components not adequately anchored, a falling hazard exists from individual bricks becoming dislodged in a seismic event. Cantilevered appendages such as chimneys, parapets and projections pose an even higher risk of becoming dislodged and falling.

The presence of reinforcing in modern masonry wall construction provides ductility, thus allowing it to perform much better in a seismic event. This ductility gives resilience and strength for the walls to move, both in plane and out of plane, due to forces from an earthquake, and return to their near original position with minimal damage. An Unreinforced Masonry building does not have this measure of toughness.

In the aftermath of the 1933 Long Beach Earthquake, extensive damage was found in URM structures. Building codes began to provide seismic standards for reinforcement, stronger connections, and overall load path derivations as minimum requirements. In addition, to alleviate the risks from URM buildings in earthquakes, building departments in seismic areas have enforced strengthening and retrofit requirements on older buildings constructed prior to the development of those codes.

FINDINGS

The building interior and exterior was visibly observed. No exterior finishes were removed during the site visit.

The floor framing and roof framing consists of wood joists and wood trusses with wood straight sheathing over the structural members, respectively. Interior walls are wood framed with no apparent lateral resisting elements such as plywood or diagonal wood sheathing. Roofing is the original mission tile.

Cracks in the exterior finish were noticed on the east and west sides of the building at the north end. It was suggested that the cracks on the north wall may have been generated by the recent Ferndale Earthquake on 12/20/22 that was felt in the area. They had not been noticed prior to that time. The cracks on the south side are at the top corner of the door at the back of the auditorium. The cracks in this part of the structure may be the result of the extended east-west orientation of the structure wing. “L” and “T” shaped structures can have

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enhanced forces in a seismic event due to the plan shape of the building. The cracks observed are likely cosmetic in nature and currently not indicative of further damage to the structure.

The floor and roof structure are in good condition except where indicated in the Architect's report. The lateral capability of the structure, however, will not meet today's building standards. Additional lateral resisting members would be required if an upgrade of significance happens.

RECOMMENDATIONS

A significant upgrade of this structure for non-structural reasons could trigger a code requirement of seismically upgrading the entire structure. A seismic upgrade of this structure would typically consist of the following:

- A testing and inspection program to determine the facing and interior brick and mortar shear capacity, strength and exact measurements. In addition, foundations would need investigating to determine size, and rebar locations.
- Using the values from a testing program, the residual capacity is determined and strengthening options considered.
- Plywood roof sheathing would be added under the mission tile. This should be accomplished at the time the roof tile is removed for roof replacement for ease of access.
- Transverse masonry cross shear walls would be located from roof to foundation. These would connect to the roof, second floor, first floor and have a new concrete footing.
- Plywood floor sheathing would be added to the second and first floor.
- Depending on the result of the testing on the exterior brick, stiffening elements may be required to prevent the brick from falling. These could be placed interior to preserve the look of the building. This could be vertical steel tubes at 6' oc, shotcrete walls inside the existing brick, or other similar methods.

Thank you for allowing Point 2 Structural Engineers to provide services on this project. We hope this report to be sufficient for your needs. Please contact us if we can be of further service.

Sincerely,

Brad J. Rollins SE
Principal
POINT 2 STRUCTURAL ENGINEERS INC.