BURNE ENGINEERING

June 6, 2022

Mark Liebenow
Facility Superintendent
Hangtown Creek Water Reclamation Facility
2300 Coolwater Creek Rd
Placerville, CA 95667

SUBJECT: Structural Observation of Existing Building

Mr. Liebenow,

Per your request, on January 25, 2022, our office performed Structural Observation of one of the buildings at the Hangtown Creek Water Reclamation Facility. The ariel photo below indicates the location of the subject building of this report. The purpose of our observation was to assess the current structural condition of the building to aide in the City's facility management and planning process. Figure 2 shows the limits of the roof area subject to our observation.

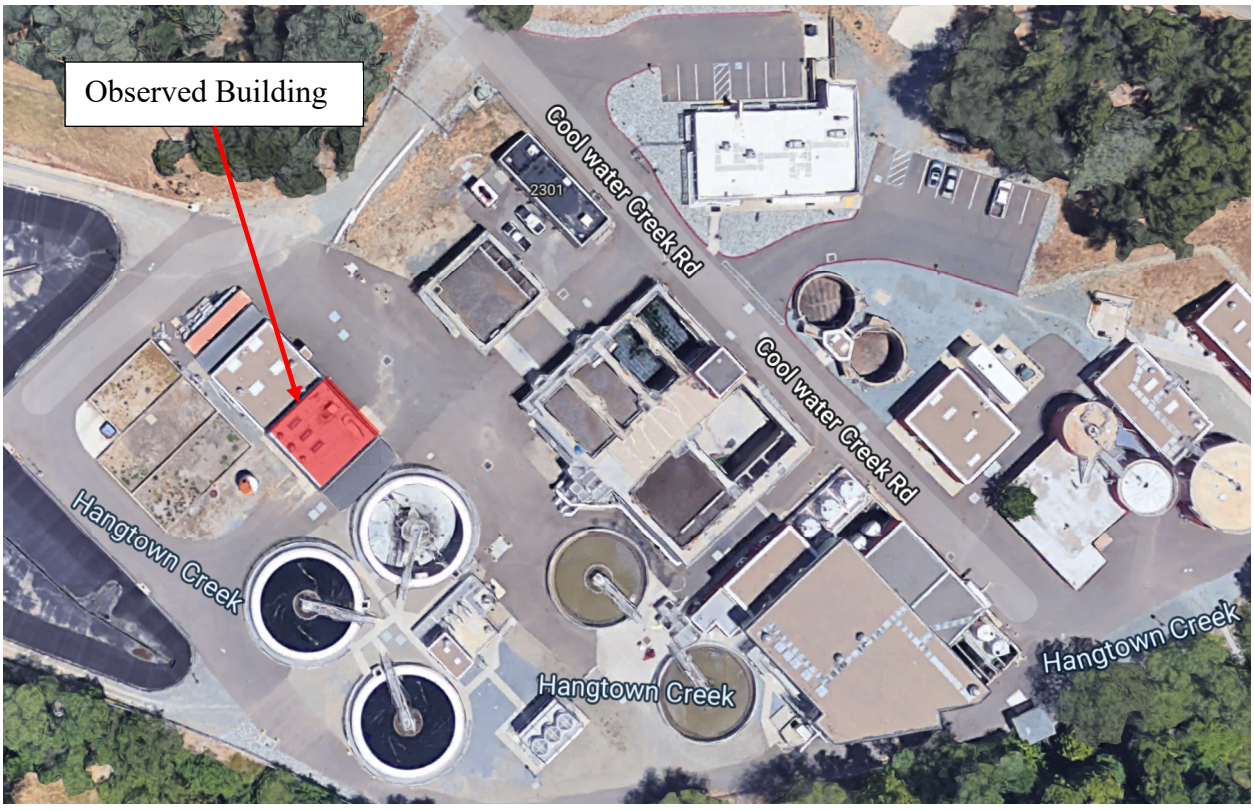

Figure 1 – Aerial View of Building Complex (© Google Maps)

The building is a reinforced concrete slab foundation with 25 foot tall, 12” wide concrete masonry (CMU) walls. The roof framing members are 2ft deep open web steel joists at 4ft on center supporting a corrugated metal deck. The joists have top chord bearing on a steel angle anchored to the masonry walls. The roof deck supports mechanical equipment at several locations. An access hatch and multiple skylights are also framed between the joists. The web members of the steel roof joists are single angles which are crimped and sandwiched between the top and bottom chord members, which are each comprised of double angles.

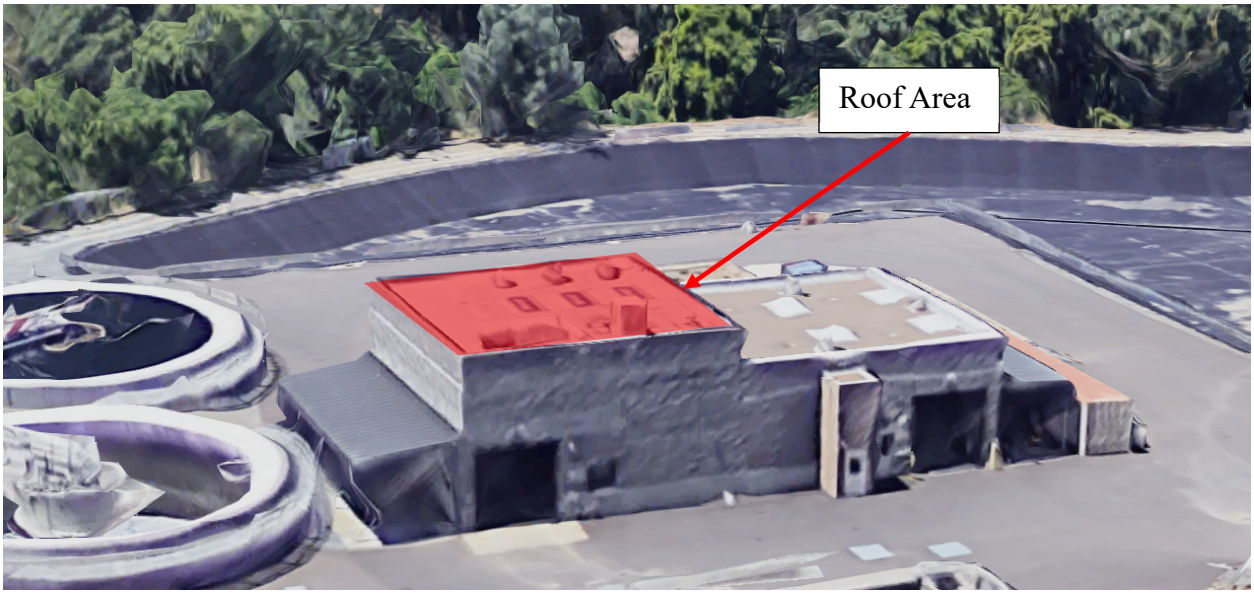

Figure 2 – Partial Elevation View of Building (© Google Earth)

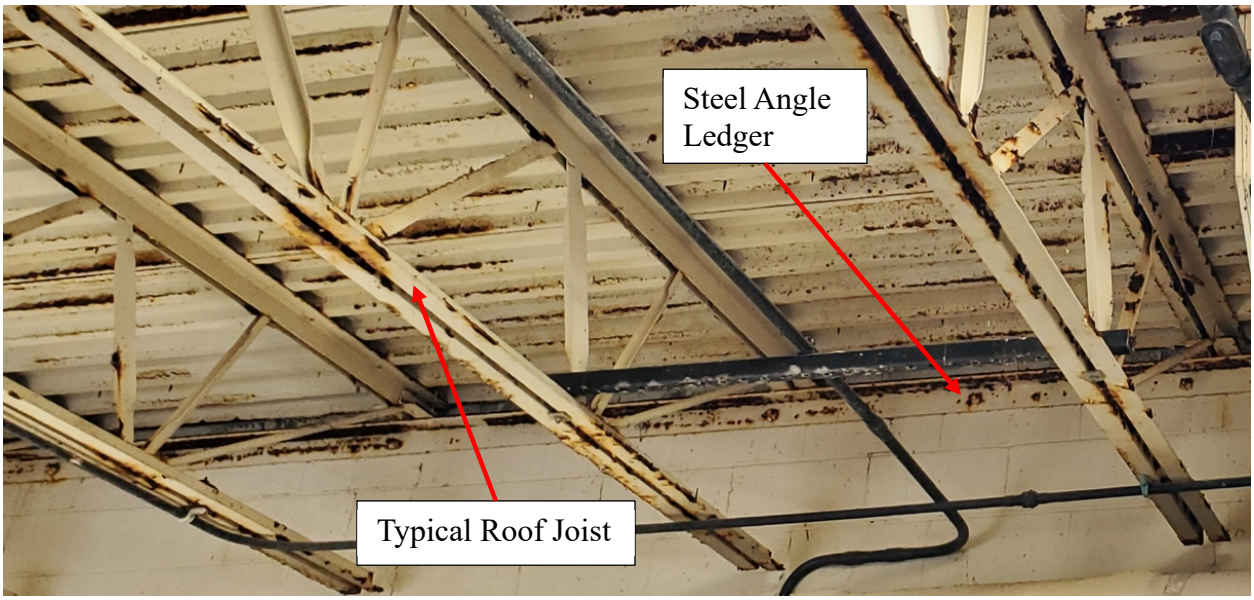

Figure 3 – Roof Joists Bearing Perpendicular to the Wall

It is our understanding that the roof deck is planned to be replaced. The scope of our observation was to evaluate the condition of the existing steel joists and help determine if the roof joists shall be replaced or retrofitted at the same time.

Throughout the roof structure, there is evidence of paint spalling and rust/corrosion on the joists, braces, and steel angle ledgers. Some of the more severe cases of rust are located at joints on the joists, near the skylights (see Figure 4), around the access hatch (see Figures 5 and 6), and at the ledger connection to the wall (see Figure 7). At a few joints on the open web steel joists, near the middle of the span, we observed a loss of section on the joist bottom chord on the order of 1/32" (more than 10% section loss). Near the access hatch, parts of the top chord appear to have lost most of its section. These areas appear to be severely damaged and should be retrofitted or replaced as soon as possible. Considering the extent of the damage to the joists and the connections to the wall, we recommend replacement of the entire roof structure.

It is our understanding that the rust/corrosion is a result of the water treatment process generating high levels of ammonia and that the current/future process will not generate ammonia or any similar corrosive substances. A contributing factor to the corrosion may be the potential water intrusion around openings in the roof. Considering this change in process and the planned replacement of the roof deck, we recommend that the roof be replaced in kind with open web steel joists connected to the CMU walls with new steel angle ledgers. Some of the embedded anchors may need to be replaced with new post-installed anchors.

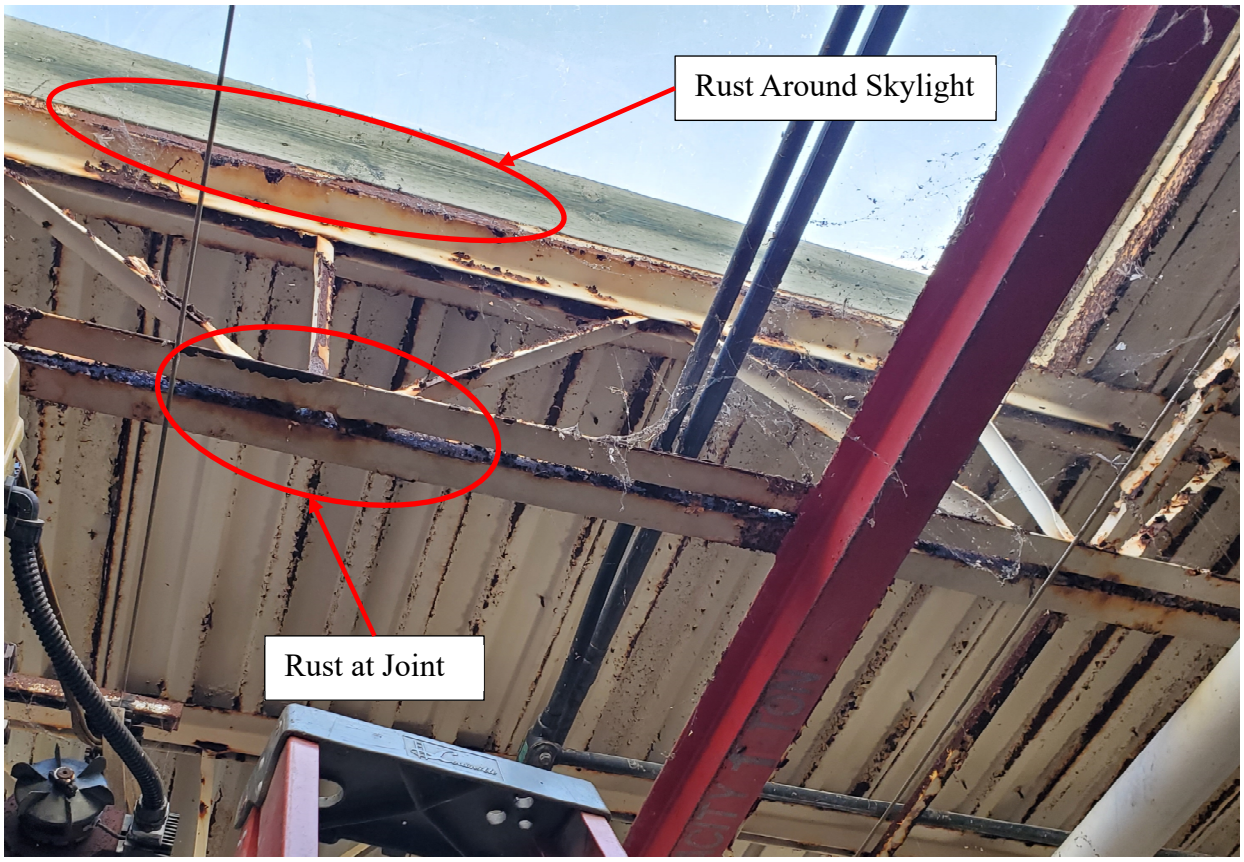

Figure 4 – Roof Joists Near Skylight

Figure 5 – Roof Joists at Access Hatch

Figure 6 – Roof Joists at Access Hatch

Figure 6 – Steel Angle Ledger at Wall

Thank you for the opportunity to provide this Structural Observation Report. Please let us know if you have any questions or concerns regarding our findings. I can be reached via email at Lori@BurneEngineering.com or phone (530) 672-1600 office; (530) 575-0744 cell.

Regards,

Lori Burne, S.E.
Principal/Structural Engineer

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