KUNA ENGINEERING

Piuraagvik Recreation Center
2022 Structural and Mechanical Inspection

Prepared for City of Utqiaġvik

Project # 165.030530

Final Report

08/01/2022

Piuraagvik Recreational Center
Utqiaġvik, Alaska

Mechanical Inspection Services
Final Report

Date: 08/01/2022 Project Number: 165.030530

To: City of Utqiaġvik

From: Tyler Kornfield, EIT
Sam Strackeljahn, PE

Introduction

KUNA Engineering's Mechanical Engineer, Tyler Kornfield, EIT, conducted a site visit to the Piuraagvik Recreational Center in Utqiagvik. The scope was to inspect issues with the damaged wood flooring and the cause of damage. Kuna engaged a structural engineering subcontractor, Trident Engineering and Inspection (TEI). The inspection work was performed on July 14, 2022 through July 15, 2022.

The primary scope of the site visit was to inspect for structural damage to the weight room and locker rooms. A mechanical engineer accompanied subcontractor TEI to assess the existing facility, the condition of the pipes, and to provide the necessary recommendations if the conditions of the pipes were the cause of any structural damage.

Historic Piping

Piuraagvik Recreation Center was constructed in 1984 and phase 1 modernization occurring in 2011-2012. The original bathroom and locker rooms were resituated when the remodel occurred (See figures 1-2). When the remodel occurred, the majority of the area was remodeled, and new fixtures and waste drains were installed. New men's and women's saunas were also installed in each separate locker room.

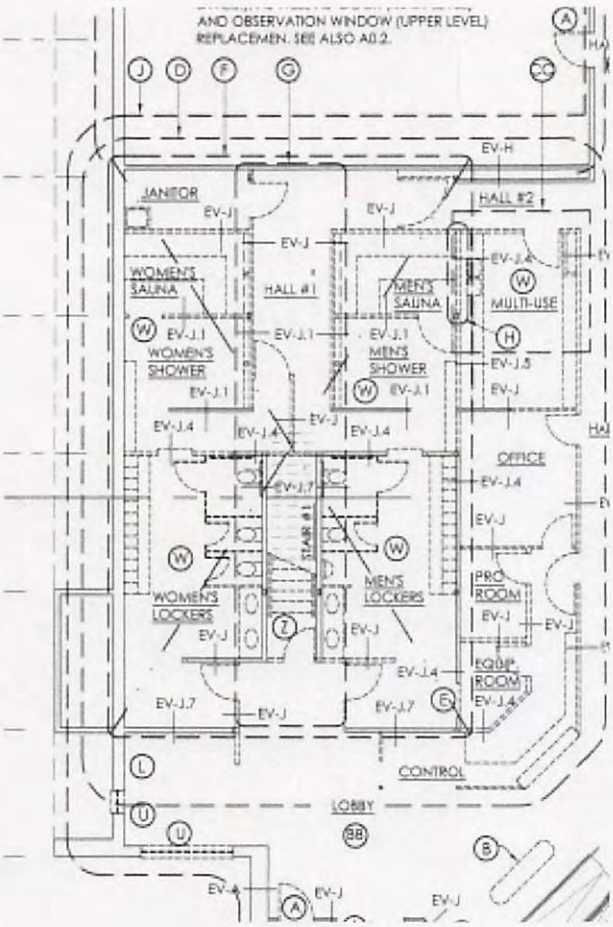

Figure 1. Historic construction

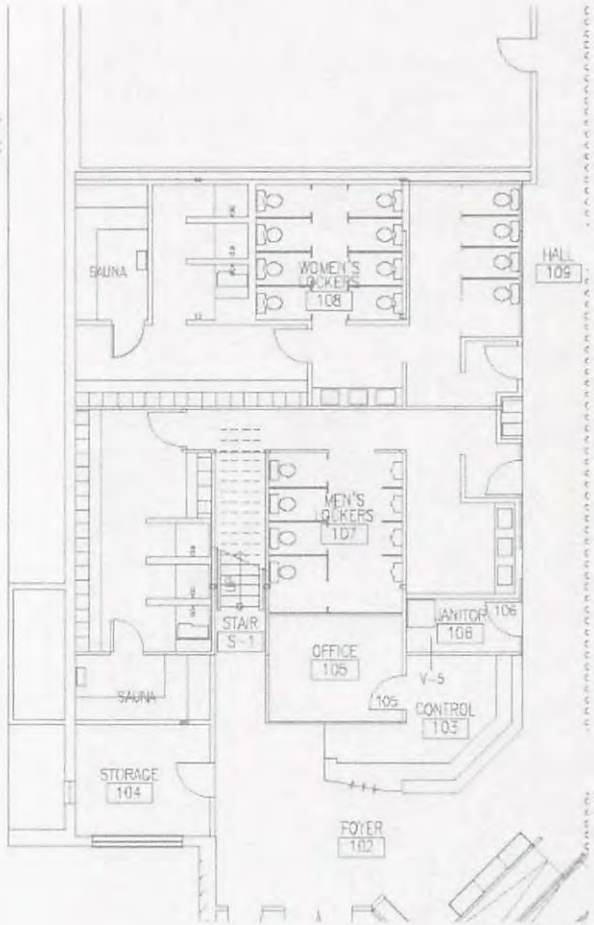

Figure 2. 2011-2012 Remodeled Bathrooms and Sauna.

Inspection

The initial inspection focused an assessment of above flooring damage and beneath building damage to find general areas of concern before accessing the crawlspace. These were the areas focused on when closer inspection was made within the crawlspace.

Most of the damage assessed was structural in nature and the assessment and recommendations provided by TEI should contain the majority of the next phase renovation options. There was no damage found that was caused by leaking of water supply pipes. There is minimal structural damage caused by the glycol heating loop which will also create inefficiencies in the heating system of the building. Those findings are included in the report below.

Damage was found in the following areas and from the following causes:

- Weight room:
  - Minor damage to the Racquetball Court surface. See attached appendix for more detail in the structural report.
- Women's Locker Room:
  - Significant damage was found, specifically beneath the women's sauna. This is due to a combination improper flooring being used and therefore delaminating from excessive heat and moisture causing bubbling and cracking. Excessive amounts of water being used on the Sauna rocks and poor drainage/floor slope lead to damage of the sub-floor (See photos 1-3). See attached appendix for more detail in the structural report.
  - In general, the majority of the sub-floor around the floor drains were overcut and the flange installed did not create a watertight seal leading to damage (See photos 4-6).
  - Floor finish has reached the end of their service. See attached appendix for more detail in the structural report (See photos 7-8).
  - Showers in the locker room were labeled out of order (See photo 9).
- Men's Locker Room:
  - Moderate damage beneath the men's locker room. The sauna sub-floor had less damage, but the same floor construction will lead to damage in the near future if not remedied.
  - Same as the women's locker room, the majority of the sub-floor around the floor drains were overcut and the flange installed did not create a watertight seal leading to damage.
  - Same as the women's locker room, floor finish has reached the end of their service. See attached appendix for more detail in the structural report.
  - Same as the women's locker room, showers in the locker room were labeled out of order.
- Glycol Heating Supply Loop
  - The glycol supply loop does not appear to have caused significant structural damage. There are areas of concern that should be considered:
    - Multiple leaking pressure relief valves. See photos 10-14.
    - Leaking elbow joints. See photo 15.
    - Leaking coupling joints. See photo 16.
    - Leaking in mechanical room. See photo 19.
    - Leaking in air heating room. See photo 20.
- CUH-1 unit could be seen with visible dried leaks. See photos 17-18.
  - It was mentioned by maintenance that the leak is formed during the winter when snow is on the roof but stops when the snow is removed.

Photo 1. Damage to sauna floor.

Photo 2. Notice of flooding.

Photo 3. Beneath women's sauna.

Photo 4. Damage around drains.

Photo 5. Cutout too large for drain.

Photo 6. Damage around drain.

Photo 7. Shower area floor damage.

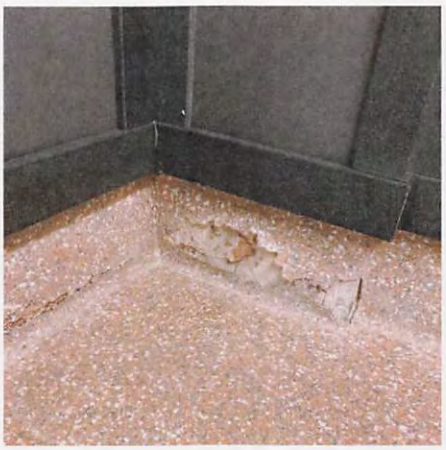

Photo 8. Shower area floor damage.

Photo 9. Notice of out of order shower.

Photo 10. Damage under drain.

Photo 11. Damage under relief valve.

Photo 12. Relief valve.

Photo 13. Relief valve.

Photo 14. Damage under relief valve.

Photo 15. Stain under elbows.

Photo 16. Leak under coupling joint.

Photo 17. Leaking CUH-1.

Photo 18. Area beneath CUH.

Photo 19. Air heating room.

Photo 20. Mechanical room glycol supply loop.

Recommendations

1. Replace flooring in bathrooms. See incorporated appendix, structural report for more detail. When flooring is replaced, ensure watertight seals around fixtures and drains. Ensure that cutouts in floor are sized properly. Ensure that drain flanges are installed correctly, flush with flooring to allow proper drainage from flooding and cleaning.

2. When replacing sauna, it should be constructed from the appropriate material that will be able to handle high heat and humidity. The floor, walls, and ceiling should have a vapor barrier according to standard sauna construction. The floor should be sloped to drain and the floor drain should be placed appropriately. If the drain is placed where it is likely to come in contact with the persons, necessary flooring is to be installed to prevent burns and allow proper drainage.

3. Replace all relief valves and specific elbows and couplings where leaks are visible to have occurred.

4. Replace showers as necessary.

5. Assess damaged uptairs CUH unit to see if needs replacing.

6. Assess glycol loop in mechanical room and air heating unit room to determine if repairs are necessary and cost effective.

Assembled by:

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