

Summary and Background

In July 2023, the condensing units outside the City Hall Common Council chambers failed, and the original air handling units (AHUs) sustained major coil damage. The units were repaired, but the City's preventative maintenance contractor advised that future repairs may not be viable. In such a condition, it was highly recommended to replace these units, as well as the condensing units.

In 2018, EMG completed a Facilities Condition Assessment (FCA) of several City owned facilities. In the summary of immediate repairs, EMG recommended initiating the heating, ventilation, and air conditioning (HVAC) design process. The HVAC at City Hall was classified as "poor", citing a need to both modernize components and replace elements beyond the usable life cycle. Specifically, the report states:

The existing mechanical system is in poor condition. The mechanical system includes component equipment from the original construction in 1936 including several components that require replacement due to their extensive age and poor performance. A professional engineer should be retained to analyze the existing condition, provide recommendations and, if necessary, estimate the scope and cost of any required repairs.

The full report can be viewed on the City's website here: https://www.ci.mequon.wi.us/sites/default/files/fileattachments/community/page/15923/emg_city_hall_report_-_7.20.18.pdf.

Included in the recommendations for the City Hall Building is a complete replacement of the HVAC system. The study recommended the progressive replacement of HVAC components starting in 2019.

Staff issued a Request for Proposals (RFP) for design services in late 2023. The RFP requested design costs for two different options: the base bid of the AHU replacement (which maintains the current configuration of HVAC components) or a base bid for the replacement of the roof top unit (RFU). With both options, it is likely that the coils, multizone dampers, and pneumatic controls will have to be replaced. While hospitals use a modern version of pneumatic controls, the version of pneumatic controls at City Hall stopped being installed in the mid 1980's, making it extremely hard to find replacement parts when needed.

Installation of variable air volume (VAV) boxes are required. This may impact the current building automation system (BAS) which may have to be updated for the compatibility and capacity of the system. The compatibility of the new AHU would be addressed in design. (GOOD, BETTER, BEST Options)

The details of both designs are detailed below. The RFP is available on the City's website here: https://www.ci.mequon.wi.us/sites/default/files/fileattachments/public_works/page/26785/rfp_chn_hvac_revised_12_7_23_jb.pdf.

Base Bid AHU Replacement (Current Configuration)

This design option requires replacement of the 6T and 15T AHUs and condensing units in their current configuration with updated local controls. This is essentially the "replace in kind" option, where the failed, failing, or compatible components are replaced, but maintain the overall configuration of the existing system. While the location of the existing failed units makes maintenance and replacement complicated, it does not require exterior work. City Hall is designated as a historic landmark, which requires that all

exterior improvements be consistent with the time period in which it was constructed. Therefore, any exterior improvements would either require shielding or concealing.

This base bid is favorable due to the ability to preserve the historic façade of City Hall. Keeping the AHU enclosed rather than subjected to weather would ensure longevity, while redesigning the structure and interior work platform could ease accessibility for preventative maintenance and work in the future. The existing AHUs would have to be removed, but ease of access for installation of new AHU's would speed up the installation process. The replacement of the condensing units outside would be included in the AHU replacement.

As stated above, the system would have to be tested to ensure that upgrades of existing HVAC including the addition of VAV boxes, replacement of coils, multizone dampers, pneumatic controls, and BAS could possibly be required.

PROS

- No impact to the building's historic exterior.
- Benefit of equipment accessibility.
- Ensures longevity and reliability.
- Faster installation.
- Safer platform / catwalk installed for maintenance on units.
- New condensing units, old condensing units were damaged, even though repairs were made, highly advised that they get replaced with AHU.

CONS

- Requires the replacement of existing platform in mezzanine, current platform does not meet requirements for safety and proper maintenance access. I-beams will need to be installed to secure platform and new AHU.
- Drop ceiling / duct removal in room behind for installation of new AHU additionally impacting the duration the Council Chambers would have to be closed.
- Asbestos abatement may be needed for pipe insulation removal.

Exhibit 1 - AHU Leaking pan unrepairable have 5-gallon pails suspended collecting water.



Exhibit 2 – Work Platform and crawl space to access platform between AHU /Motor / Ductwork.

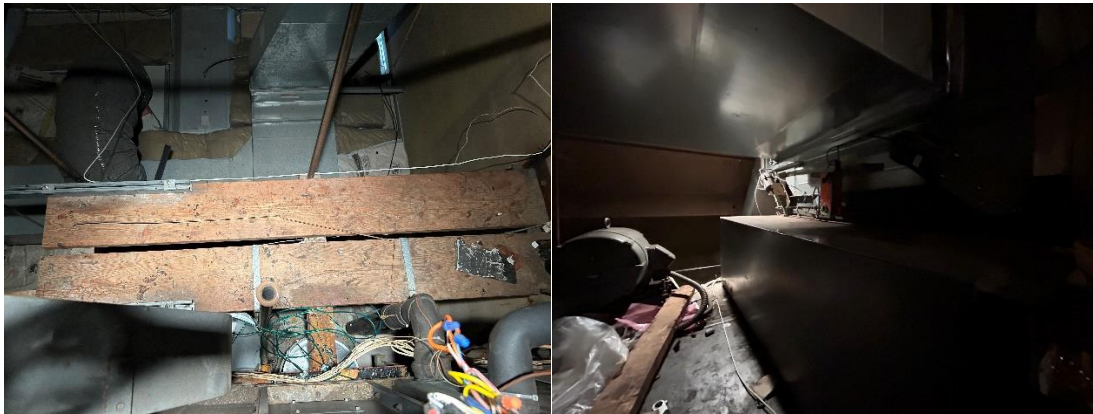


Exhibit 3 – Dated Pneumatic Controls

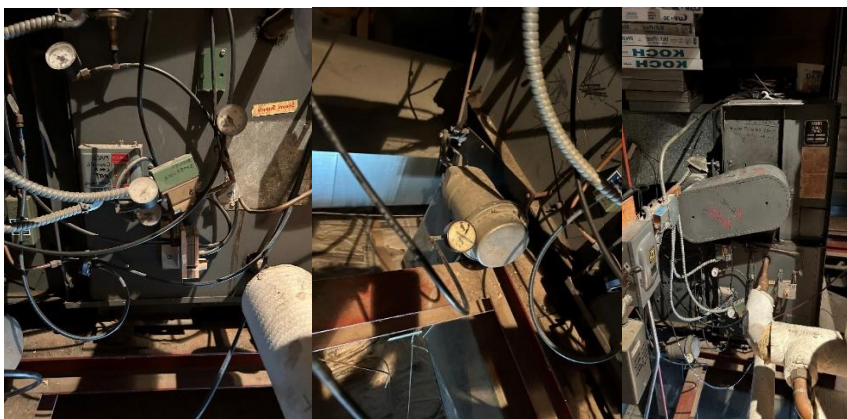
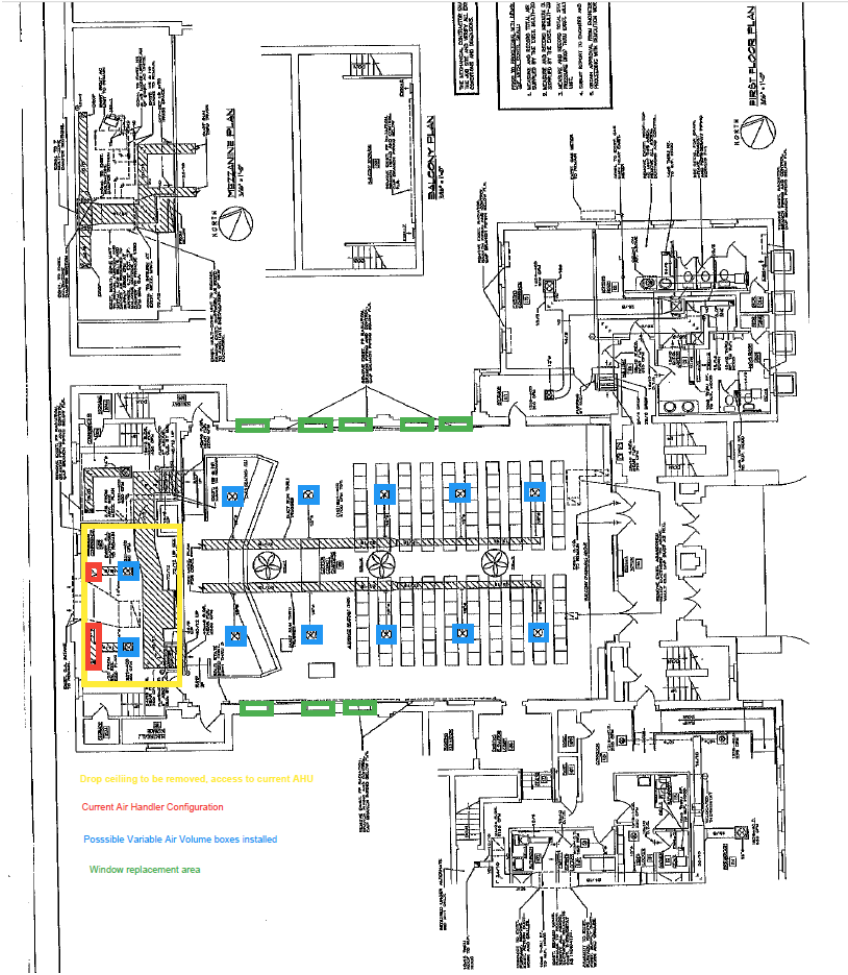


Exhibit 4 – DX Coils to supply heat using pneumatic control may have to be switched out for VAV boxes.



Exhibit 5 – Plan of affected area with this option.



Base Bid 25 Ton RTU (Roof Top Unit Placed Outside)

Replacement of the 6T and 15T AHU with a 25T RTU that will be placed outside, duct work to go into building and run straight up from the inside. The 25T RTU is a standalone unit, condensers for cooling and burners for heating are all contained within this unit, putting less strain on our current boiler. Having the RTU at grade level would make preventive maintenance and future repairs easier compared to where current AHU are placed. Along with noise reduction in the Council Chambers as the unit would be outside. RTU has more flexibility and control over zoning within the unit, aiding to its ability to be extremely energy efficient. Screening of the unit will be required to maintain the building designation as a landmark. Bid documents will incorporate natural green screening designed by the city but will need parameters for distance around the unit.

PROS

- Heating / cooling contained within the RTU unit adding flexibility of zoning/controlling, as well as energy efficiency.
- Less work for current boiler, which ensures longevity to current boiler
- Unit is outside, which provides ease of access for preventive maintenance.
- Current condensing units need replacement and the RTU replaces current condensing units.

CONS

- Large duct work entering the building through basement windows affecting the aesthetics of the building.
- Running duct work inside the building will be expensive.
- Loss of parking including handicap parking on the west side of the building.
- A ramp would have to be added to the main entrance to ensure handicap accessibility (this is also on the capital projects list).
- Vegetation screening would have to be installed around RTU.
- Design approval from Landmark Commission.
- Large unit (8'W X 24'L X 7.25)
- Asbestos abatement would be required.
- Interior wall construction to hide duct work throughout the west interior wall of the original building.
- Exposed to elements shortens life span of RTU.
- May impact the existing "Fire Alarm System" since VAV's installed would require smoke detectors in duct work.



Common Council chambers will be closed during construction. As such, there is an opportunity to complete additional projects on the capital list that would otherwise require Common Council to be closed in the future. The projects listed below are compatible with the HVAC project and could result in efficiencies if the work is completed concurrent to the HVAC project.

The HVAC work does not require this work to be completed, but it would remain on the capital project list as a future expense.

Ceiling Removal & Modernization

Removal of popcorn ceiling in the Common Council Chambers, the plaster underneath the popcorn ceiling contains asbestos and would have to have an asbestos abatement. New options for modernization of the ceiling could include ceiling clouds, perimeter soffits, and different lighting options. Replacement of the ceiling would also improve the acoustics of the Council Chambers; design would be needed to cover best options available to the City of Mequon.

Pros

- Accessibility to upgrade electrical, lighting control, audio/video, lighting, and duct work.
- Improved acoustical quality and reverberation.
- Improved air flow direction and velocity.
- Sound reduction from mechanical room.

- Modernization including dropped ceiling clouds, perimeter soffits, range of material, color, and lighting options.
- Aesthetically pleasing.
- Fixes water damaged areas of the ceiling.

Cons

- Common Council Chambers closed for a longer duration.
- Asbestos abatement would be needed.



Lighting/Electrical Replacement

Upgrade all existing fluorescent lighting (pendant/scone) with energy efficient LED lighting. Lighting controls to be upgraded to have capability of growing the Building Automation System (BAS). Existing pendant lighting integrity is questionable, the fluorescent tubes within the current lighting system are dated, replacement bulbs will become obsolete in the near future.

Pros

- Energy efficiency and utility cost savings.
- Updating from fluorescent to LED.
- Better security / safer fixtures. The current pendant lighting integrity is questionable.
- New lighting controls (BAS).
- Integrate sound system with new ceiling.
- Design / installation will meet or exceed current electrical codes.

Cons

- Current electrical would have to be upgraded.
- Common Council Chambers closed for a longer duration.

Lighting Pendant Securing Failure:



Window Replacement CHN

Design and replacement of the (8) current windows in the Council Chamber. The current window seals are damaged, and panes are broken, windows should be replaced with the HVAC project. New windows would be approved by the Landmark Commission and improve the energy efficiency of the Council Chambers while adding to the overall aesthetics of the Council Chamber.

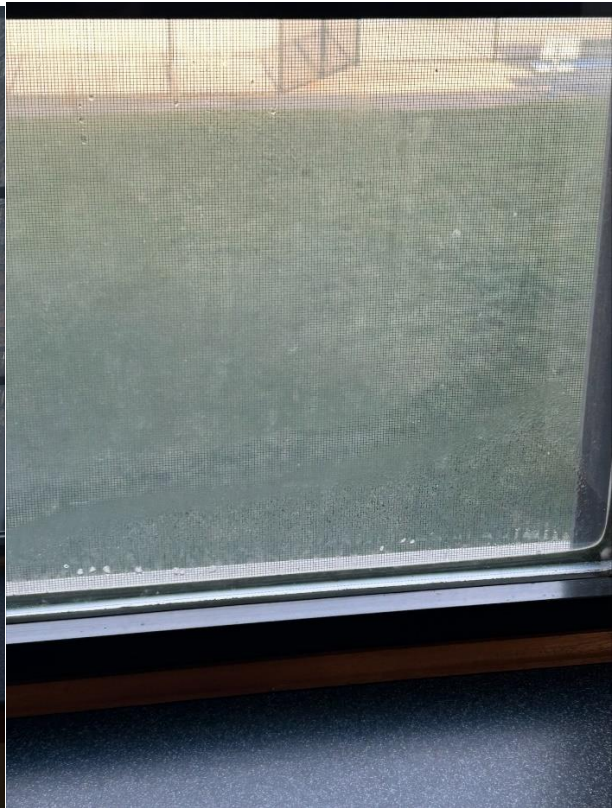
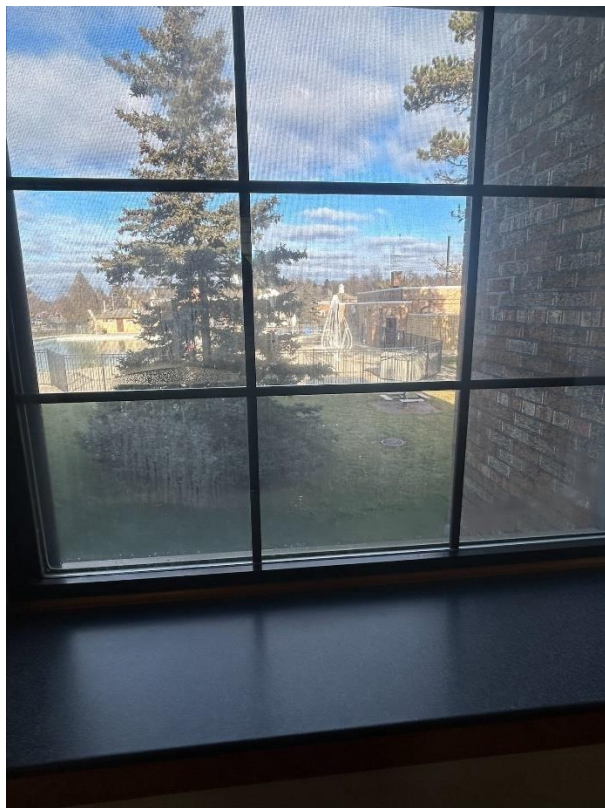
Pros

- Energy efficiency resulting in reduced heating / cooling costs.
- Current windows need to be replaced; every seal in the windows is broken letting air pass through, multiple windows are cracked, spring tensioners are not working – cracking the windows even further.
- New windows would be approved by the Landmark Commission, as the current windows are not.
- Cost savings compared to increasing the cost of needed replacement in the future.

Cons

- Common Council Chambers would be closed for longer duration or need to be closed again in the near future for replacement.







Flooring Options (A) Hardwood Floor with Mequon Logo & (B) Carpet Squares

Removal of approximately 4000 square feet of carpet down to the plywood underlayment, the plywood underlayment is encapsulating asbestos tile and cannot be removed without abatement. Option A would replace the carpeting with hardwood flooring with the City of Mequon logo and/or compass in the center near dais. This option would require acoustical ceiling modifications to limit echoing in the chambers. Option B would replace the carpet with carpet squares that could be replaced as worn or damaged (ex: blood drive). Carpet tiles have unlimited options for solid colors to patterns.

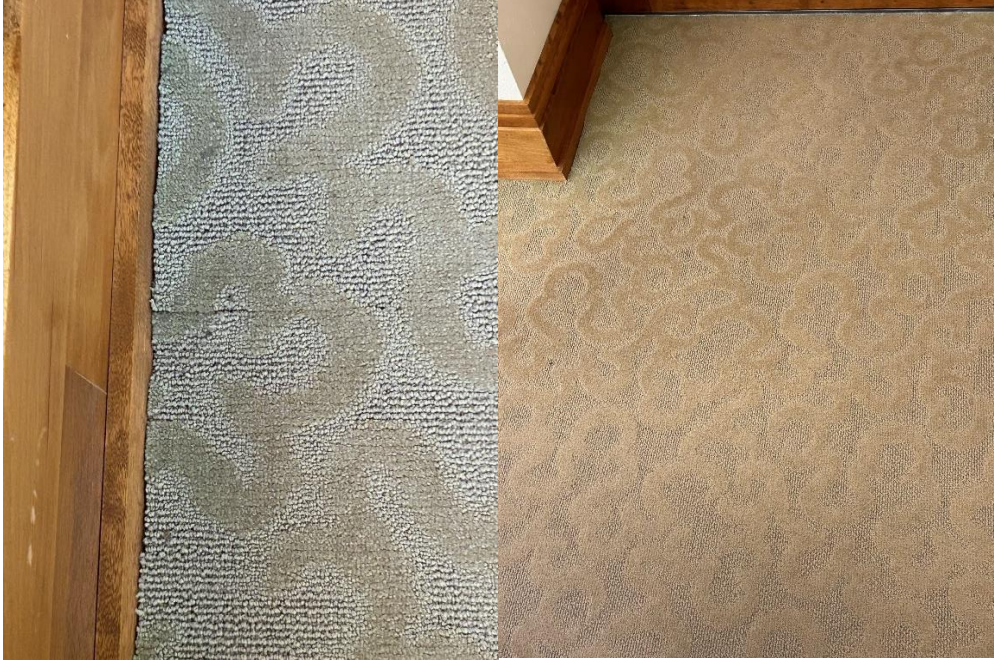
Pros

- Aesthetically Pleasing
- Updates Council Chambers
- Easily cleaned / square replacement if stained (Blood Drive, meetings, etc.)
- Makes room look complete.

Cons

- Council Chambers would be closed for longer, in future Council chambers would have to be closed again.

Current Carpet Worn and Peeling (staining cannot be removed with carpet cleaning):



Examples Of Possible Flooring Options:

