

Library HVAC FAQ

Timeline:

The system is 10 years old and has an average 15-year lifespan. In early 2021 problems began: The system needed to be recharged but didn't hold. In the Summer window AC units installed to help keep cool while system was not working, in the Fall the compressor was replaced. The system continued to have issues. Over time we had repeated visits from repair to address leaks in the system from "Reflok" brand fittings that had failed. Two compressors have been replaced already. Reflok fittings are no longer made and company is out of business. Not all fittings have been replaced, it is unknown how many more are still in place and will likely fail.

2/13/23: work begins with Cape Light Compact to review the options for system repair or replacement. In discussion with a local professional, an air to water heat pump system was suggested as the best option for the building at an initial pre-design, estimated cost of \$800,000 - \$1,200,000.

April 2023: Town meeting asked for authorization to borrow \$1,200,000

8/23: Engineering Review (not design) of system is complete – 3 different options are proposed

NOTE: All cost estimates were prior to full design of any system

- 1) Make minor changes to current system and continue to repair
 - a. Sets up the library for continued & repeated problems
 - b. Continued lack of easy access to attic components for repair
 - c. \$50,000 - \$100,000 annually for repairs
- 2) Partial System Replacement
 - a. Phased in replacement with exposed fan coil units
 - b. Lower cost
 - c. Does not address all problems (service access, proprietary system, etc.) and will continue to risk refrigerant leaks. Service access is limited due to the VRF system configuration. Proprietary system components are inherent to VRF and ductless split heat pumps. This results in multiple pieces needing replacement when one piece fails.
 - d. Continued large volume of refrigerant which will eventually be phased out of use due to environmental concerns
 - e. \$500,000 - 1,000,000 Additional existing system parts would need replacement a few years after the partial system replacement.
 - f. Portions of the existing system utilize electric resistance heat.
 - g. The existing system has a higher consequential comfort interruption from the heat pump winter defrost cycle than the recommended AWHP system.
- 3) Full Replacement with air to water heat pump system
 - a. Increased flexibility to replace parts without proprietary link to outside unit
 - b. Minimal use of refrigerant, entirely outside of the building envelope, eliminating risk to occupants and reducing replacement costs.

- c. Lessens distribution components which require a mechanical fan, less moving parts to break and easier to service. This statement is true, progress was made, but we could not implement this in many rooms given the building configuration. With the current VRF system or its replacement VRF system, no progress could be made since valance convectors are not compatible with VRF.
- d. Improved comfort during the heat pump defrost cycle.
- e. Improved energy efficiency from the reduction of electric resistance heat.
- f. \$800,000 - \$1,200,000

***Why did the projected cost double?**

The cost that was estimated was not based on the actual design and the scope of the project work increased. It also didn't include the cost of the Owner's Project manager, Commissioning of the system and the Engineer's services. Further, once the design was underway it became clear that the current generator would not be nearly large enough to run the HVAC and the other systems in the building in a power failure, adding the cost of a new generator and wiring a new electrical panel to the project.

***Why does the system need to run in a power failure?**

The Library is the heating and cooling center for the town. In the event of a weather emergency it is the building that has been designated for town resident's and visitors to go if they need.

***Why can't we use a local company to do the work?**

We can if they are certified by the State AND they actually want/need the work and are the low bidder on the project. I am not aware of local companies that have become DCAMM (state) certified. We would welcome bids from qualified local companies.

***Why can't we just install minisplits?**

Residential mini splits are not appropriate for large commercial buildings. The system would require a separate ventilation system installed that would need to be ducted. Further there is not enough wall space to fit the number of mini splits that would be required even if they were otherwise appropriate. This system would have a limited lifespan and if one went down it could affect all that were piped with it. Refrigerant leaks and proprietary interface issues could return to the building.

***Why do we have to take the low bid?**

State law dictates the bidding process. Unless the low bidder is considered unable to do the job, we are mandated by law to take the low bidder. This is in place to protect taxpayer's money and eliminate fraud & abuse of the public trust.

***What is the timing for this project?**

Bidding should be complete at the end of May, early June. This could allow the work to be done in the fall before the next heating season.