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Town of Hudson

MASSACHUSETTS 01749-2193

To: Select Board

From: Thomas Gregory

Date: April 1, 2025

Re: Proposed HVAC Improvements to Town Hall

Article 7 on the Annual Town Meeting Warrant requests a sum of money be appropriated to make improvements to the HVAC system in Town Hall. The purpose of this memorandum is both to provide context for the needed repairs as well as to outline specific information relative to financing this project.

The current issues with the HVAC system in Town Hall are related both to the age and to the design of the original system. The chiller and associated controls were installed in 1999 during a significant renovation to Town Hall. The chiller has exceeded its useful operating life, and as a result, we experience operational issues with the chiller every summer during the cooling season. The other issue relates to air circulation in the various offices and conference rooms on the first and third floors. The volume of air that is circulated varies considerably between small offices with standard height ceilings and offices, such as those on the third floor, which have very high ceilings. There are days in both the summer and winter when different parts of the building experience temperature extremes at one end or another.

In 2023, in response to a Request for Qualifications (RFQ) issued by the School Department, the Town entered into a 20-year energy management services contract per G.L. Ch. 25A, Sec. 111 with TRANE. The contract identified a number of school buildings as well as Town Hall as needing system upgrades. Last year, TRANE worked with the school department to install air conditioning in the Farley Elementary School. This year, I have been working with TRANE to identify solutions that would address the HVAC issues in Town Hall. One of the many benefits of an energy management services contract is that once a contractor is selected via the RFQ process, there is no additional procurement needed for specific building projects.

The attached proposal from TRANE identifies a phased approach to addressing the issues at Town Hall. I am recommending that this work commence in May combining Phase 1-D and Phase 2 (shown on the second page of the proposal). Phase 1-D would replace the existing 30-ton chiller with a modular 30-ton chiller-heater and upgrade the chiller controls. Phase 1-D would also add a heat pump component to the chiller which would partially take the load off the natural gas boiler in the winter months. In Phase 2, TRANE would install variable air volume

systems (VAVs) and full building controls to adjust the airflow to match the cooling and heating demands on the first and third floors. The VAVs would also increase the energy efficiency of the system.

In May of 2026, TRANE would initiate a Phase 3 which would install a second 30-ton modular chiller to expand cooling to the 2nd floor auditorium and install an energy recovery ventilation (ERV) system to maximize the efficiency of the airflow throughout the auditorium. Conditioning this space would give the Town the ability to use this space as a meeting room for boards and committees.

Because these phases produce a partial decarbonization by reducing the load of the fossil fuel boiler, the project will likely qualify for a $500,000 Green Communities Decarbonization Grant. After receiving guidance from the Department of Energy Resources (DOER) yesterday, we are working with TRANE to apply for this grant which has a deadline of April 4th. Additional incentives may include a $30,000 grant from Hudson Light and Power, a $70,000 MassSave Heat Pump Rebate, and incentives from Eversource for control upgrades (amount TBD).

The total appropriation required to initiate Phase 1-D and Phase 2 together this year is $915,000. To meet this appropriation, I am recommending that $490,619.76 be transferred from prior year capital projects where balances currently remain (as shown below), and a transfer from Free Cash of $424,380.24.

Account Name/TM Date & Article	Account Number	Original Appropriation	Unspent Balance	Original Purpose
TH Air Handler - Art 6 5/19	3713-100-1230-5890-049	$39,000.00	$33,987.50	Replace TH Air Handler (basement)
TH Renovations - Art 5 6/20	3800-100-1232-5890-049	$297,556.00	$124,021.00	Town Hall Renovations
TH Renov (CPA) - Art 18 5/18	3333-284-1984-5790-411	$212,130.00	$117,463.31	Renovations to Town Hall
Energy Use Reduction - Art 17 5/13	2970-100-1232-5513-049	$30,000.00	$15,147.95	Town's portion of costs associated with reducing energy consumption and/or advancing renewable energy projects at municipally owned properties; to study or implement energy conservation measures at any or all of the following buildings: Hudson Public Library, Town Hall, Police Station
TH HVAC- Art 5 5/23	4126-100-1236-5790-049	$200,000.00	$200,000.00	HVAC Improvements to TH
Total			**$490,619.76**	

I am available to answer questions.

cc: Neil Vaidya, Finance Director
Finance Committee

Hudson Town Hall HVAC Upgrades

Existing Conditions

The Town Hall building is air-conditioned by a 1999 30-ton Trane Air-Cooled Chiller. Chilled water is distributed to an AHU located in the Basement serving the first floor, and to (2) AHUs located in the Attic serving the 3rd floor. The chiller is over 25 years old and is past its useful working life. The Auditorium is on the 2nd floor and tends to become hot in the shoulder and summer season - there are (5) floor mounted, vertical hot water cabinet unit heaters to heat the auditorium with no cooling. The first floor is served by a constant volume AHU located in the basement that does heating and cooling and is controlled by one thermostat for the entire floor. Individual rooms have no control over their respective temperatures, leading to comfort issues.

Proposed Solutions

Ph-1: Replace existing chiller, with provision to expand cooling to the auditorium in future

This scope will replace the existing 30-ton air cooled chiller which is at the end of life with a provision to expand the system to provide cooling to the second-floor auditorium in future

- Install a new 30-ton air cooled modular chiller (AXM, 30% glycol)
- Provide new chiller controls

Ph-1D: Replace existing chiller, with provision to expand cooling to the auditorium in future

This scope will replace the existing 30-ton air cooled chiller which is at the end of life with a 30-ton chiller-heater that can be expanded to a 60-ton chiller-heater in future, that can help in building decarbonization by offsetting heating to the chiller away from the fossil fuel boiler, and also provide cooling to the second-floor auditorium in future

- Install a new 30-ton air cooled modular chiller-heater (AXM, 30% glycol)
- Provide new chiller controls

Add Alternate first floor and third floor VAV boxes

First Floor: This scope proposes adding (5) zones to the existing constant volume AHU system serving the first floor to provide improved occupant comfort.

- Install (9) VAV boxes and (5) zone temperature sensors (wireless) to create (5) separate zones.

Third Floor: This scope proposes adding (12) zones to the existing constant volume AHU system serving the third floor to provide improved occupant comfort.

- Install (16) RIRO boxes and (12) zone temperature sensors (wireless) to create (12) separate zones.

For each AHU, add Trane controls to operate the AHU as a variable volume system via the existing VFD and control the air flow of the VAV boxes based on the zone heating/cooling demand.

Full Project: Replace existing chiller, expand cooling to the auditorium and add new controls

This scope will replace the existing 30-ton air cooled chiller which is at the end of life, expand the system to provide cooling to the second-floor auditorium and install a new Trane controls system.

- Install a new 60-ton air cooled modular chiller (AXM, 30% glycol) to accommodate additional auditorium cooling load.
- Upgrade the existing primary chilled water pump to a higher flow pump.
- Modify the chilled water distribution system to serve the second-floor auditorium via (4) new risers originating in the basement.
- Replace the (5) existing auditorium heating only cabinet unit heaters with (5) four-pipe fan coil units to add cooling capability.
- Replace existing standalone BAS control system with new web enabled Trane controls (SC+) system. The new control system will serve the heating plant, cooling plant, basement AHU, (2) attic AHUs, (2) FCUs (6) CUHs, (5) new auditorium FCUs and (5) fin tube radiator zones.

Full-Project -D: Replace existing chiller with a Chiller-Heater, expand cooling to the auditorium and add new controls

This scope is equivalent to a heat pump solution where the chiller-heater will provide chilled water in summer, and hot water in winter to air-condition the building through the existing AHUs. This will shift heating load from the fossil fuel boiler to the electric chiller-heater and serve to decarbonize the building. This solution will likely qualify for the Green Communities Decarbonization grant, which can be $500k.

Phased Summary

- **Phased Decarbonization Project**
  - Phase 1 - D: 30T Modular Chiller Heater Only
  - Phase 2 - D: Plus, VAVs on 1st and 3rd Floor and Building Controls
  - Full Project - D: 60T Modular Chiller Heater with VAVs on 1st/3rd and Auditorium Cooling, with Full Building Controls

- **Phased Expansion Project (No Decarbonization)**
  - Phase 1: 30T Modular Chiller Only
  - Phase 2: Plus, VAVs on 1st and 3rd Floor and Building Controls
  - Full Project: 60T Modular Chiller with VAVs on 1st/3rd and Auditorium Cooling, with Full Building Controls

Pricing Phased

Option	Description	Notes	Budget
Ph 1	30TR modular chiller only, chiller controls only	Aud cooling can be added later	**$450k**
Ph 1-D	30TR modular chiller heater only, chiller controls only	Decarb option: Aud cooling can be added later	**$515k**
Ph 2	VAVs 1st and 3rd floor, full building controls	Add to either Phase 1 or Phase 1-D	**$400k**
Ph 3	Add 30TR modular chiller to expand cooling to Auditorium + ERV for ventilation	Expanding cooling to Auditorium	**$875k**

Full Project

Full Project	60TR modular chiller, VAVs 1st and 3rd floor, Aud cooling+ERV	Full Scope	**$1.5M**
Full Project - D	60TR modular chiller-heater, VAVs 1st and 3rd floor, Aud cooling+ERV	Decarb option: full solution	**$1.6M**