City Hall HVAC Project

KAWARTHA LAKES

Background

Purpose

- To inform about ongoing HVAC issues and challenges related to the Pandemic, recommendations to address those.
- To seek direction on options for replacement.

Context

- City Hall has reached the ‘Major Capital Renewal Stage’ for building elements from 25 to 35 years after the complete restoration / expansion done in 1980’s.
- Need for significant re-investment in City Hall. Key drivers include:
  - Age and Condition and increasing failure rate
  - Building performance, especially ventilation and temperature control
  - Operating costs for energy and maintenance
  - Accessibility
  - Space Efficiency/Demands
  - Environmental Factors
- Large scale and complex project, where multi-year staging = increased challenges
  - Implementation may involve need for ‘staging’ staff outside the building
  - COVID is impacting space conditioning standards to increase ventilation in buildings (re, ASHRAE).
- Can demonstrate commitment to City’s Healthy Environment Plan

Facility Investment to Date

- City Hall is in the 'Capital Renewal Stage' of its life-cycle.
  - Asset was renewed in 1986
  - The consolidated 'useful life' of the building is 50+ years
  - Major capital investment is needed typically between age 25 to 35 years
- Key investments total $2,938,372 made between 2015 and now(2020):

#	When	Action	Value
1	2015-2017	Building Envelope	$ 1,843,734
2	2016-2019	Council Chambers and Victoria Room	$ 658,323
3	2019	Interiors	$ 99,409
4	2019-2020	HVAC Replacement (expenditures to date)	$ 336,906

- Need is still indicated for investment in:
  - Heating Ventilation and Air-Conditioning System
  - Fire and Life Safety Systems
  - Lighting Systems
  - Interior finishes and fitments

Future

HVAC Need is Now

Overview of the HVAC Project

Scope of Work Summary

- Replace old equipment and upgrade system performance and efficiency.
- Replace/improve piping and ducting
- Improve controls and install a building automation system.

Project Approvals and Actions To Date

- Initial planning in 2018-2019. Project development was completed in 2020. Contract documents are completed. Contractors have been prequalified for the work.

Year	Action	Value
2020-21	Phase 1 construction	$883,474.57
2021	Phase 2 construction	$1,712,453.20
2021-22	Phase 3 construction	$1,113.399.99
	Total construction cost	**$3,709,327.76**
	HST Payable	$65,285.71
	Current Commitments & Expenditures	$475,680.32
	Total Project Value	**$4,250,233.79**
	Total Budget (approved)	$1,490,000.00
	Current Funding Gap	**$(2,760,233.79)**

What Are the Projected Benefits?

Building Improvement	Result
Building zone control/automation	Better quality work environment through temperature control, humidity control and reduced air velocity (covid concern), and enhanced filtration etc.
Improved air quality (Also a COVID concern)	Presently have a ventilation shortfall of 1500 cfm. Project would eliminate that deficit. Ventilation improved in accordance with standards (ASHRAE).
Reduced energy consumption & Improved carbon footprint	Projected energy costs for 2020 are $108,284.00. We could see as much as a 40% reduction.
Reduced maintenance costs	Rolling 3-year average for costs have increased over 110% to between 2008 and 2018. Opportunity for significant cost avoidance by as much as 50%.
Increased system reliability	Reduced equipment failures. Reduced work orders issued to staff and contractors. Improved work environment for occupants.
Reduced space impacts & Improving space flexibility	Improve circulation and free up access to about 500 sf of space by removing floor mounted HVAC units.

Considering the Options

Factors	Option 1 Expedited Timeline	Option 2 Current Timeline	Option 3 Extended Timeline
Schedule	• 18 months • Completion 2022	• 3 years / stages • Completion 2022	• 5 years • Completion 2024
Cost – Construction & Consulting	• $ 4,250,233.79 Total • Including $90,272.19 est. inflation • Lowest project cost option	• $ 4,318,267.51 Total • Including $157,129.18 est. inflation • Medium project cost option	• $ 4,519,606.19 Total • Including $354,985.45 est. inflation • Highest project cost option
Benefits • Financial – Capital & Operating Costs • Energy Consumption • Carbon Footprint • IAQ / Ventilation	• Shortest timeline • Major capital cost in 2021. • Achieve material benefits starting 2021.	• Cost spread over 3 years • Major capital cost in 2021. • Achieve material benefits starting 2021.	• Spread cost over longest timeline • Major capital cost in 2023. • Achieve material benefits starting 2023.
Project Logistics (Including other cost risks)	• COVID risks may have impact on supply chains (materials) and contractor workforce. • COVID may have relatively greater schedule impact • Best option for stipulated sum contract with one General Contractor	• Some added disruption – temporary work processes in place for 12 months. • Phasing = some contracting challenges • If staging required, would add moderate cost.	• Service disruption – temporary work processes in place for 36 months. • Phasing = major contracting challenges • If significant staging required, would add cost.

Staff considered an option to change direction (a “Do-Nothing” option). Not only would this add capital project cost, but it is a reactive option, and the outcome would have limited results and loss of investment.

Considering the Options – Expedited Option 1

Year	Spend	Phase Balance	Escalation	Project Balance	Notes
2020	$ 883,474.57	$ 2,735,521.00	$ 90,272.19	$ 2,825,793.19	
2021	$ 1,712,453.20	$ 1,113,339.99	$ -	$ 1,113,339.99	Phase 2 Work
2021-22	$ 1,113,339.99	$ -	$ -	$ -	Phase 3 Work
2022	$ -	$ -	$ -	$ -	
2023	$ -	$ -	$ -	$ -	
2024	$ -	$ -	$ -	$ -	
		Escalation	**$ 90,272.19**		This is the estimate of costs projected to account for escalation
		Base Construction Cost	$ 3,618,995.57		
		Sub-total Construction Cost	**$ 3,709,267.76**		Sum including estimate for escalation for this Scenario
		HST	$ 482,204.81		
		Hst payabe	$ 65,285.71	$416,919.10	Projected tax rebate
		Total Construction Cost	**$ 3,774,553.47**		Sum for construction costs including escalation
		Project Commitments To Dat	$ 475,680.32		This is total of current PO's issued taxes included
		Total Project Cost	**$ 4,250,233.79**		This is the total cost to deliver the project in the Expedited Scenario

Considering the Options – Current Option 2

Year	Spend	Phase Balance	Escalation	Project Balance	Notes
2020	0	$ 3,618,995.57	$ 119,426.85	$ 3,738,422.42	
2021	$ 2,595,927.77	$ 1,142,494.65	$ 37,702.32	$ 1,180,196.97	Phase 2 Work
2022-23	$ 1,180,196.97	$ -	$ -	$ -	Phase 3 Work
2023	$ -	$ -	$ -	$ -	
2024	$ -	$ -	$ -	$ -	
2025	$ -	$ -	$ -	$ -	
		Escalation	**$ 157,129.18**		This is the estimate of costs projected to account for escalation
		Base Construction Cost	$ 3,618,995.57		
		Sub-total Construction Cost	**$ 3,776,124.75**		Sum including estimate for escalation for this Scenario
		HST	$ 490,896.22		
		Hst payabe	$ 66,462.44	$ 424,433.78	Projected tax rebate
		Total Construction Cost	**$ 3,842,587.19**		Sum for construction costs including escalation
		Project Commitments To Dat	$ 475,680.32		This is total of current PO's issued taxes included
		Total Project Cost	**$ 4,318,267.51**		This is the total cost to deliver the project in the Current Scenario

Considering the Options – Extended Option 3

Year	Projected Spending	Phase Balance	Escalation	Project Balance	Notes
2020	$ -	$ 3,618,995.57	$ 119,426.85	$ 3,738,422.42	
2021	$ 883,474.57	$ 2,854,947.85	$ 94,213.28	$ 2,949,161.13	Phase 2 Work
2022	$ -	$ 2,949,161.13	$ 97,322.32	$ 3,046,483.45	Phase 3 Work
2023	$ 1,712,453.20	$ 1,334,030.25	$ 44,023.00	$ 1,378,053.25	Phase 4 Work
2024	$ 1,378,053.25	$ -	$ -		Phase 5 Work
2025	$ -	$ -	$ -	$ -	
		Escalation	**$ 354,985.45**		This is the estimate of costs projected to account for escalation
		Base Construction Cost	$ 3,618,995.57		
		Sub-total Construction Cost	**$ 3,973,981.02**		Sum including estimate for escalation for this Scenario
		HST	$ 516,617.53		
		Hst payabe	$ 69,944.85	$ 446,672.68	Projected tax rebate
		Total Construction Cost	**$ 4,043,925.87**		Sum for construction costs including escalation
		Project Commitments To Dat	$ 475,680.32		This is total of current PO's issued taxes included
		Total Project Cost	**$ 4,519,606.19**		This is the total cost to deliver the project in the Extended Scenario

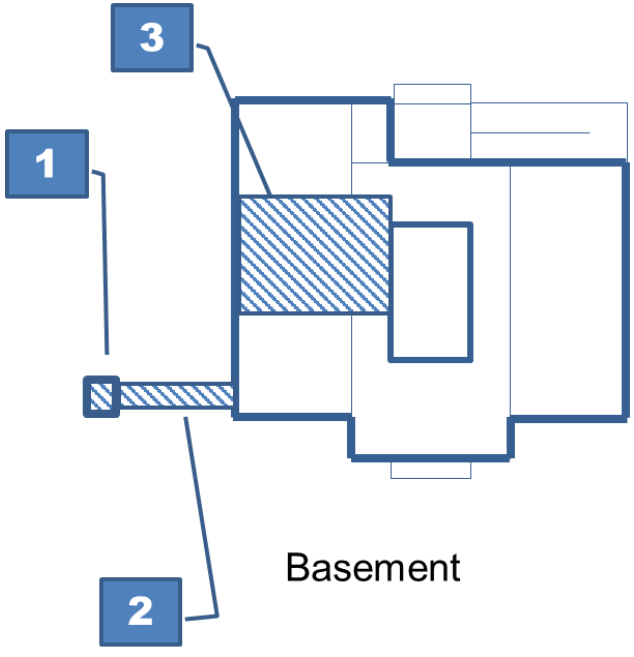
Recommendation

- To proceed with **Option (1) Expedited Timeline**
  - The construction project will continue from 2020, through until 2022.
  - Community Services be directed to include capital request for funding on expedited timeline. Current total funding request is $2,760,234.
- Complete contract documents for issuance through Procurement Division early 2021.
- Project team to work closely and coordinate with departments
  - Integrated approach to planning the temporary relocation, if required, of staff and work processes
  - Identify options to minimize the need for staging space

Appendix A: VRF System Components

Element	Location	Function	Details
Cooling Tower	Exterior – behind HR	Cools the Facility	Existing cooling tower was past end of useful life.
Compressor	Basement mechanical Room	Adjusts refrigerant flow	Aids in pushing refrigerant through the system.
3 Pipe System	Throughout Facility (Concealed)	Transfers refrigerant to temper (heat/cool) indoor air	It allows for variable temperatures in different spaces.
Boiler	Mechanical Room	Produces heat for the facility	Existing unit is past the end of its useful life.
Interior Units	Ceiling Mounted	Provides hot or cold air to each space	Existing units are floor mounted taking up floor space. They are noisy, past the end of their useful life and failing.
ERV Units	Roof Top	Reuses hot/cold from exhaust air to produce new hot/cold air	Drastically improves energy efficiency by recycling heat.
Zone Control Boxes	Ceiling Cavity/Attic	Controls Room Temp	Allows for one zone to be cooled, while another zone is heated.

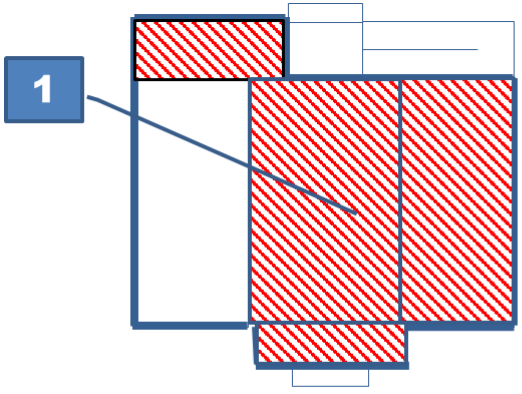
Appendix B: Phasing and Staging the Work



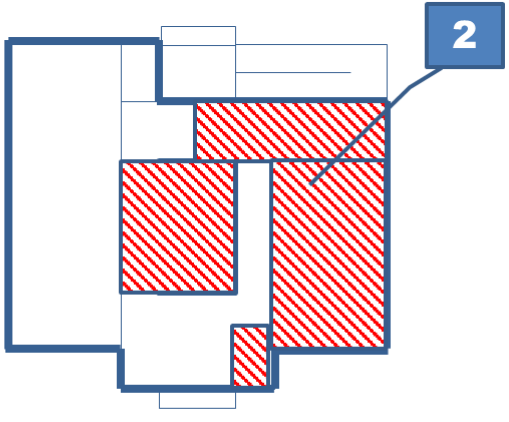
*Phase **ONE***

1. Install new Cooling Tower
2. Install new under-ground duct
3. Install new equipment (esp; Compressors and Boiler).
    a. Relocate Mechanical Room inside basement to save cost and time and minimize disruption.
    b. Complete all new physical plant installation and temporary connection to existing HVAC equipment, to be in place until next stage

Phasing and Staging the Work Continued



Basement



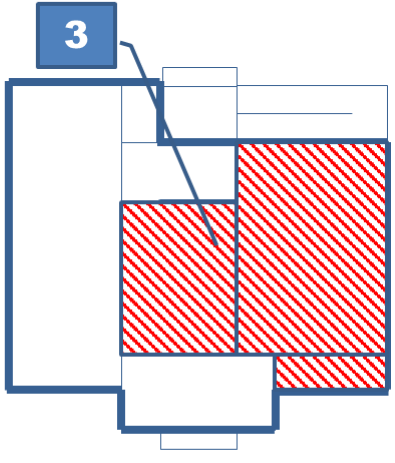
First floor

*Phase **TWO***

1. Relocate occupants in shades areas to off-site staging space. Return on completion of this stage.
2. Install units for north and east side suites.
3. Install units and piping on 1st floor east side suites.
4. Install units and piping on 2nd floor east side suites.
5. Install new roof

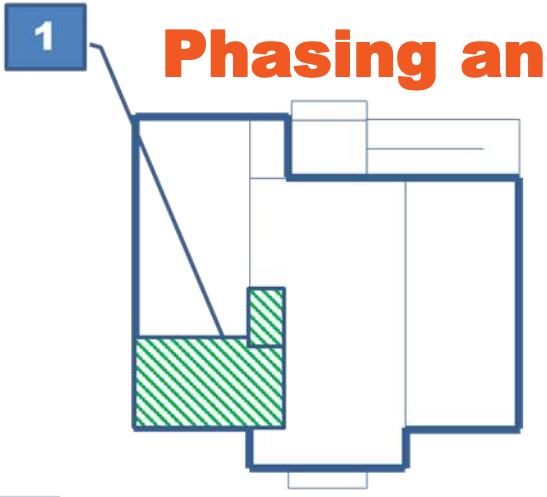
ERV unit on

east side.

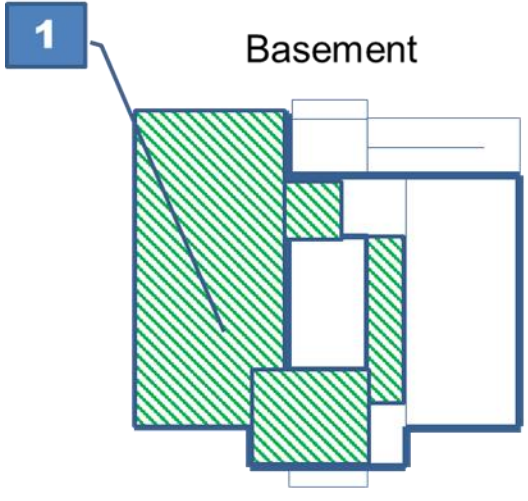


Second floor

Phasing and Staging the Work Continued



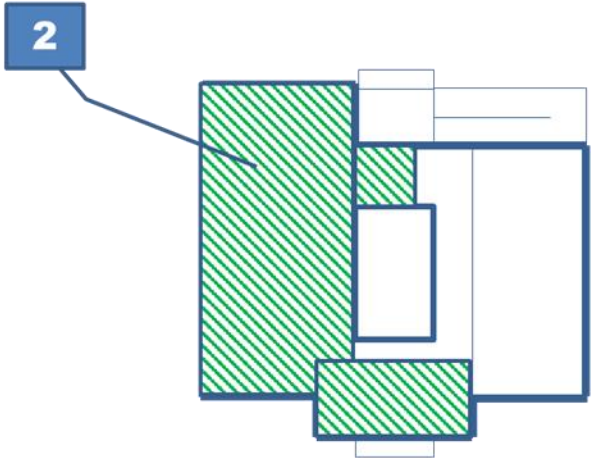
Basement



First floor

*Phase **THREE***

1. Relocate occupants in shades areas to off-site staging space. Return on completion of this stage.
2. Install units and piping on 1st floor west side suites.
3. Install units and piping on 2nd floor west side suites.
4. Install units and piping through South West Suite.
5. Install new roof ERV unit on west side.



Second floor

Appendix C: Project Organization