9/28/2023

Winter Park City Hall

ASHRAE Level II Energy Audit

15 lightyears
Energy Testing | Solar Power | Green Certification

TLC ENGINEERING SOLUTIONS

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Executive Summary

TLC Engineering Solutions (TLC) and 15 Lightyears performed an ASHRAE Level 2 facility energy audit of the Winter Park City Hall as a part of a contract with the City of Winter Park.

This report is related to the energy-consuming systems only and is intended to fulfill the requirements of an ASHRAE Level 2 Energy Audit, per the guidelines set forth by the ASHRAE document "Procedures for Commercial Building Energy Audits." The purpose was to observe existing conditions and gather information that would enable TLC to render an opinion concerning conditions or deficiencies that could affect efficient use of this facility, and to identify potential areas for improvement. Neither the field visits nor this report is intended to uncover hidden defects or the presence of hazardous materials.

TLC reviewed the construction drawings (dated May 5, 1963), renovation drawings (dated June 30, 1977), current utility bills from January 2021 through December 2022, subsequent project documentation, and visited the site in January 2023 to review the mechanical and electrical equipment, the HVAC and lighting controls systems, and observe each space type and its general energy use intensity. During this time, TLC was granted access to the building automation system to view the operation remotely. In the course of its work, TLC obtained extensive photo documentation of the conditions of the facility. Several of the photographs are included in Appendix C of this report, and the reader is encouraged to thoroughly review the photographs and descriptions, as they are intended to support and supplement the observations described herein.

After the time on site, TLC developed energy saving spreadsheets to assist with the analysis of recommended Energy Conservation Measures (ECMs), Facility Improvement Measures (FIMs), and evaluated BAS trends. The combination of all the walkthrough and post-walkthrough activities led to the development of the ECM and FIM list. A complete description and analysis of each ECM, as well as a table summarizing estimated cost and savings of each measure, can be found later in this report in the Energy Saving Opportunities section.

Project Information & Contacts

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General Facility Description

The Winter Park City Hall is a two-story civic building of approximately 24,039 square feet, which is split into two sections, a West Wing and an East Wing. The East Wing hosts all city hall operations. An aerial view of the City Hall is shown below.

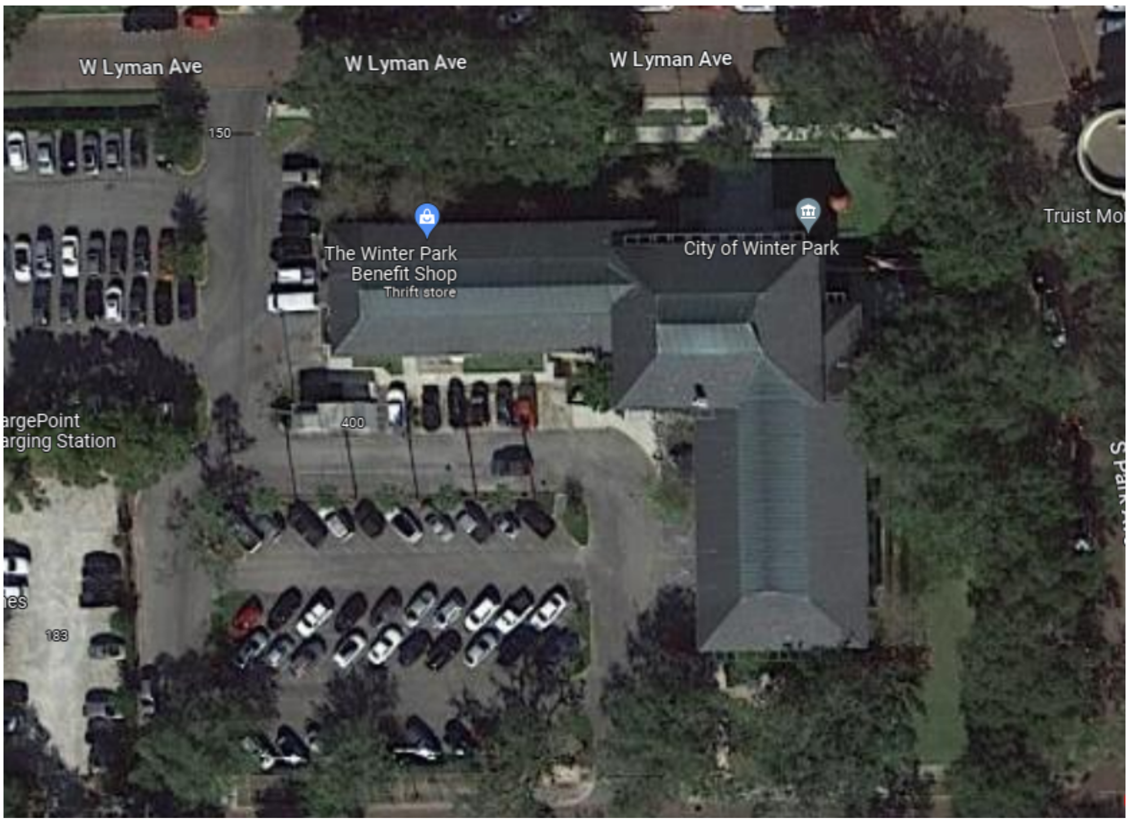


Figure 1: Aerial View of the Winter Park City Hall

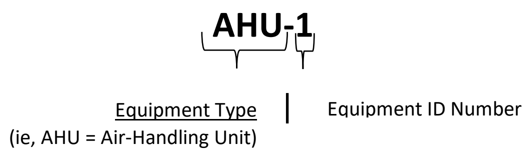
The basement level hosts mechanical rooms, dormitories, emergency operations, and restrooms. The East Wing first and second floor hosts all offices and spaces necessary for city hall operations and restrooms. This includes the council room. The West Wing, in 1977, had an additional level built and renovations performed.

Mechanical Systems

The Winter Park City Hall features mechanical systems with equipment dated from 1990 at the oldest, to 2019 at the newest. Overall, the building utilizes split system air conditioning systems, a chiller, a cooling tower, a boiler, chilled water pumps, and condenser water pumps. Mechanical system information came from a combination of resources, including information gathered during TLC's audit walk-through of the building and building automation system review, construction drawings provided by the City of Winter Park (dated May 5, 1963). The below breakdown of the mechanical systems and areas they serve is TLC's best attempt to consolidate all avenues of information into one master list.

Equipment Naming Convention

The general naming convention used on the mechanical drawings is shown below. Please note, this convention applies to most of the equipment, but not all equipment.



Air Handling Units

Air conditioning for a majority of the building is provided by several chilled water air handling units and split-system air handling units. The units are equipped with variable frequency drives (VFDs) to allow supply air to modulate based on changing load conditions. Additionally, conditioning is provided at the zone level via variable air volume (VAV) terminal units that allow more localized control of the air conditions in occupied spaces. The VAVs are tied to the air handling units via the BAS to ensure proper comfort for building occupants.

Water-Cooled Chiller

The building HVAC systems are supplied with cooling capacity via a water-cooled chiller, located within the building. The chiller includes two refrigeration circuits and VFD-controlled condenser water pumps to modulate chilled and condenser water capacity required to accommodate building load. The chiller and cooling tower are controlled via the building automation system to ensure that the air handling units receive the proper chilled water flow.

Exhaust Fans

Exhaust fans were observed, providing general exhaust for restrooms located within the building.

Boiler

The building also utilizes one (1) boiler for heating of the building. It is important to note that there was limited information on the boiler.

Building Controls

The building is currently controlled by a centralized Building Automation System (BAS) utilizing Direct Digital Controls (DDC). The BAS allows for monitoring, scheduling and setpoint adjustment of the different HVAC systems. The BAS is a Trane Tracer Ensemble system with graphics for the major pieces of equipment.

Lighting Systems

Interior lighting throughout the facility is predominantly a mix of linear fluorescent fixtures utilizing T8 lamps, and fixtures fit for incandescent bulbs. The lighting is controlled manually with no occupancy controls. Flood lights are utilized for the exterior lighting.

Domestic Water Fixture (Plumbing) Systems

The building is served by one (1) electric water heater. The Rheem water heater has a capacity of 85 gallons, and can utilize up to 9 kW. The water heater is accompanied by a hot water recirculation pump.

Building Envelope

The building envelope systems date to the original 1963 original construction of this facility, and the additions and renovations made in 1977. The façade is stucco over block wall construction. During the walk of the site, no visible insulation or infiltration issues were identified from inspection of the accessible building envelope components.

Key Operating Parameters

Winter Park City Hall is open from 8am to 5pm on weekdays, and is closed on weekends.

Site Visit

The site was audited by TLC and 15 Lightyears in January 2023. A full evaluation of existing energy consuming systems, compliant with ASHRAE Standard 211-2019 was performed. During the audit, TLC personnel were escorted by the City of Winter Park facilities manager, Leif Bouffard. He, as well as any facility staff that were available for comment, were questioned on system operation, condition, and maintenance of the building systems.

Utility Analysis

Historical Utility Data

The building is currently served by electricity and water utilities. Electrical utility consumption and demand values were provided for the months of January 2021 through June 2023. The monthly consumption profile is as expected, where values increase in the warmer months due to cooling needs. No billing statements were provided, but a blended rate for kWh savings was determined based on published rates. Calculation of the blended utility rate takes into account the non-fixed costs associated with electrical utilities use by the facility, including fuel charges, per-kWh cost, demand charges, etc. Table 3 details the components of the blended rate calculation.

Table 1: Annual Baseline Energy Consumption

Utility	Total
Annual Electrical Consumption (kWh)	565,099
Annual Electrical Cost	-

The following graph and tables show the total consumption and demand per monthly billing period for electricity.

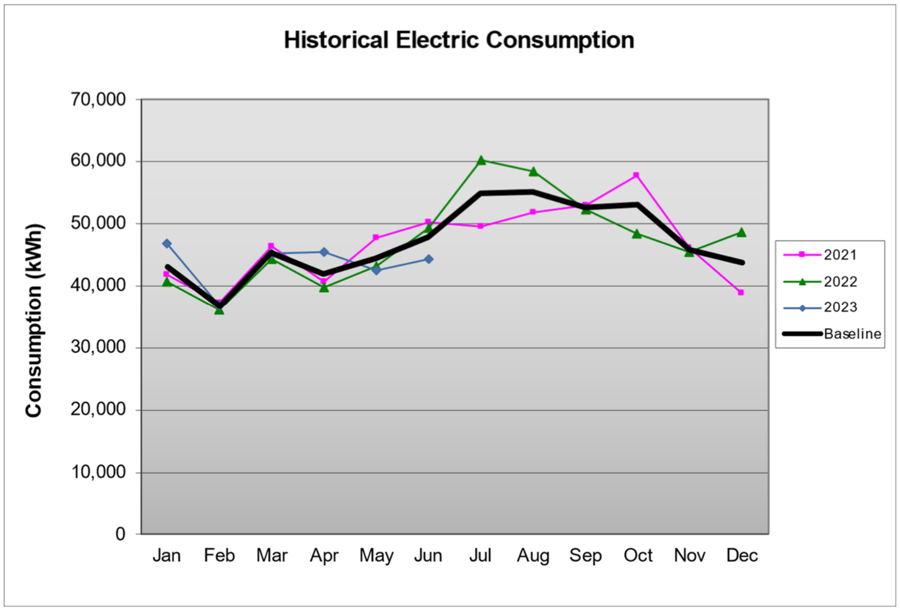


Figure 2: City Hall Electric Consumption

Table 2: City Hal Electricity Consumption Data

Date	Consumption (kWh)	Demand (kW)
Jan-21	41,924	199.81
Feb-21	37,288	194.93
Mar-21	46,315	212.08
Apr-21	40,600	206.6
May-21	47,757	242.26
Jun-21	50,354	235.18
Jul-21	49,672	251.35
Aug-21	51,830	96.46
Sep-21	53,017	122.07
Oct-21	57,763	116.13
Nov-21	46,125	116.13
Dec-21	38,769	97
Jan-22	40,589	101.26
Feb-22	36,216	91.39
Mar-22	44,323	106.99
Apr-22	39,678	106.99
May-22	43,242	113.19
Jun-22	49,257	118.08
Jul-22	60,397	130.13
Aug-22	58,488	126.24
Sep-22	52,355	126.6
Oct-22	48,357	129.18
Nov-22	45,513	129.18
Dec-22	48,675	129.18

Date	Consumption (kWh)	Demand (kW)
Jan-23	46,830	129.18
Feb-23	36,788	129.18
Mar-23	45,287	129.18
Apr-23	45,528	129.18
May-23	42,560	129.18
Jun-23	44,318	129.18

Benchmarking

TLC compared energy consumption for City Hall using common benchmarks to gauge how the site compares to similar ones both regionally and nationally, principally through the use of Energy Star Portfolio Manager. The building's Energy Use Intensity (EUI), which is used by energy engineers to determine overall energy consumption to a common unit of measure, was compared to other similar buildings throughout the United States. The Energy Use Intensity measures annual consumption of electricity per square foot, in kBTU/sf/year.

These benchmarks were developed by the Department of Energy and are based on feedback from building operators all over the country. Using the utility billing information and observing the system operation allows the energy profiles to be broken down to greater detail. The facility was modeled in Portfolio Manager as an office building.

The historical energy consumption was entered into Portfolio Manager. Based on most recent 24-months of utility data, the chart below compares Winter Park City Hall to the average energy use intensity (EUI) of similar buildings in Energy Star's database.

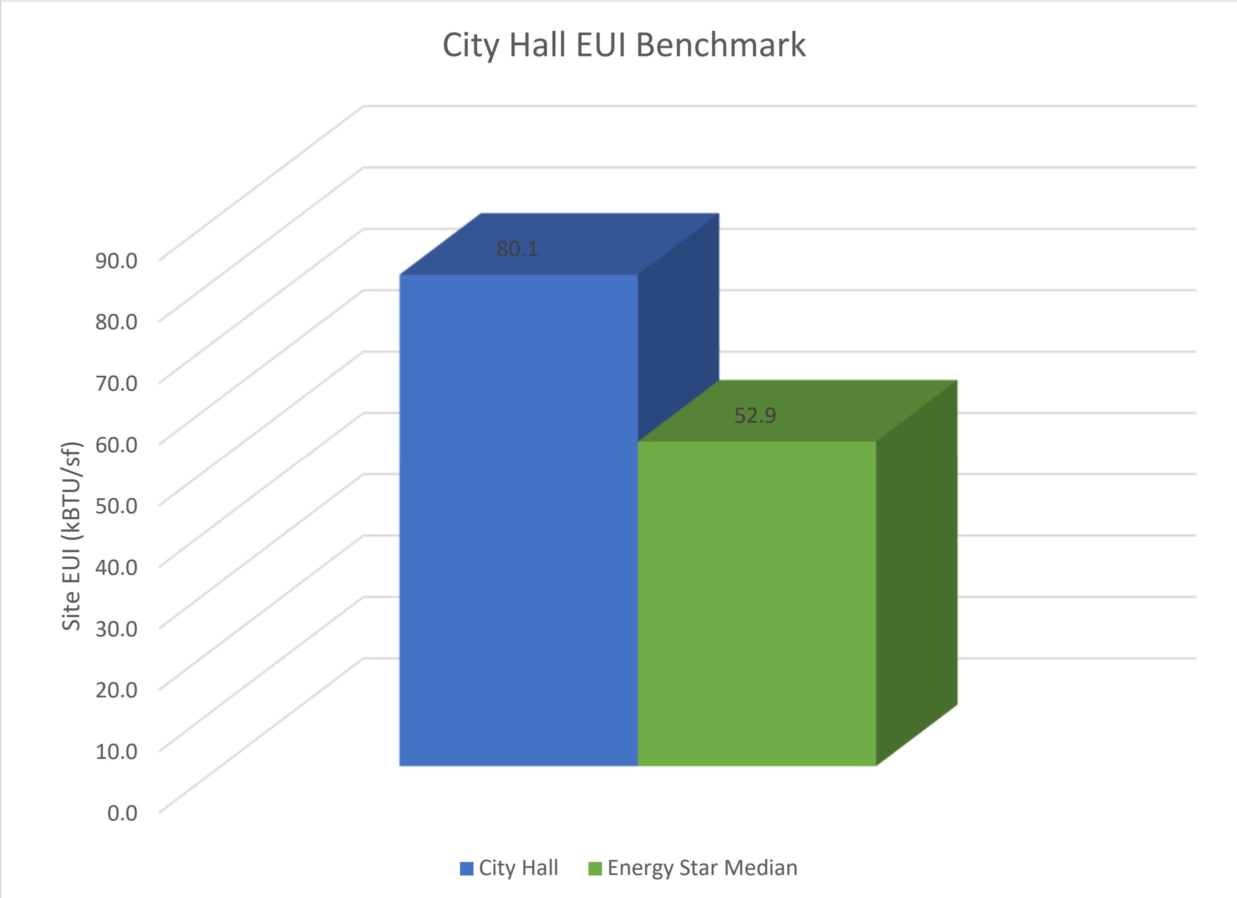


Figure 3: City Hall Energy Performance Comparison

Based on most recent 24 months of utility data, a comparison can be drawn between City Hall and the average energy use intensity (EUI) of similar buildings throughout the United States. The median EUI for an office building in the United States is 52.9 kBTU/sf, and the calculated EUI of the City Hall is 80.1 kBTU/sf. It is worth noting that the median value reported by Energy Star is dependent on the annual responses from building surveys, and that the occupant load of buildings of the same type can vary significantly. In the case of City Hall, the building is not used purely as an office. The energy conservation measures detailed in this report will serve to further decrease the EUI of the City Hall building.

Utility Rate Analysis

The building is provided with electricity by the City of Winter Park (CoWP), following their Rate Schedule GSD-1, General Service – Demand. The utility rate charges shown below were used to calculate the costs associated with the provided consumption and demand. Energy savings calculated for this building have been assigned a blended rate of $0.1028/kWh, which is the calculated blended rate not including fixed customer charges.

Table 3: Utility Rate Schedule

Description	Charge
Demand Charge	$5.05 per kW of billing demand
Energy Charge	$0.04216 per kWh
Fuel Cost Recovery Factor	$0.02281 per kWh
Gross Receipts Tax	2.5641%
Franchise Fee	6.00%
Electric Utility Tax	10.00%
EL State Sales Tax (Commercial Only)	7.45% (First $5,000)
EL State Sales Tax (Commercial Only)	6.95% (Over $5,000)

Average Rates

As noted above, a blended cost per kWh has been calculated from the rate schedule. Savings for this building have been calculated using the blended rate. The following table details the average rate over the period of analysis.

Table 4: Average Utility Rate

Utility	Average
Electricity	$0.1028/kWh

Energy Saving Opportunities

The operation and condition of equipment at the Public Safety building was observed to offer a few different avenues for improvement. This is to be expected given the age of the equipment itself and how long it has been in service. Improvements can be made by replacing the aging equipment as well as optimizing the control sequences and settings. The following table summarizes the recommended ECMs for this facility that should be considered for future projects. In addition, the table distinguishes between measures specifically intended to save energy (ECMs) and facility improvement measures (FIM) that benefit the overall operation of the facility but may not provide significant energy savings.

Table 5: ECM/FIM Summary

Energy Savings Measure	FIM/ECM	ECM Category	Annual kWh Savings	Annual $ Savings	Cost $	Payback (years)
DX Retrofits	ECM	Medium Cost	4,802	$494	$7,160	14.5
HVAC Controls Optimization	ECM	Low Cost	1,232	$127	$1,200	9.5
Envelope Improvements	ECM	High Cost	1,257	$129	$21,049	162.9
Lighting Improvements	ECM	Medium Cost	11,281	$1,160	$7,358	6.3
CRAC Unit Retrofit	FIM	Capital Improvement	--	--	$90,000	
Totals			**18,572**	**$1,909**	**$36,767**	**19.3**

*ROI calculations exclude capital improvement items, as they are intended more for facility improvement than for energy savings.

The cost and paybacks shown in the table above are estimates based on the information gathered during the auditing process. TLC utilized RSMeans 2023, as well as engineering best practices, to estimate the cost of these suggested measures. Final pricing will vary based on contractors' estimation and final equipment selections. Final payback periods are also dependent on contractor pricing and the facility's negotiated utility price.

DX Retrofits

General Description

This measure proposes replacing existing DX equipment, which is at or nearing the end of its predicted useful life. Direct expansion (DX) air conditioning equipment consists of a refrigerant loop, in which the refrigerant is compressed and expanded at different points of the loop to transfer thermal energy. Typically, a refrigerant coil is placed directly in the supply air stream, where the refrigerant absorbs thermal energy as it evaporates and expands. Thermal energy is rejected at a compressor, where the refrigerant is compressed and condenses, rejecting the heat that was removed from the supply air steam.

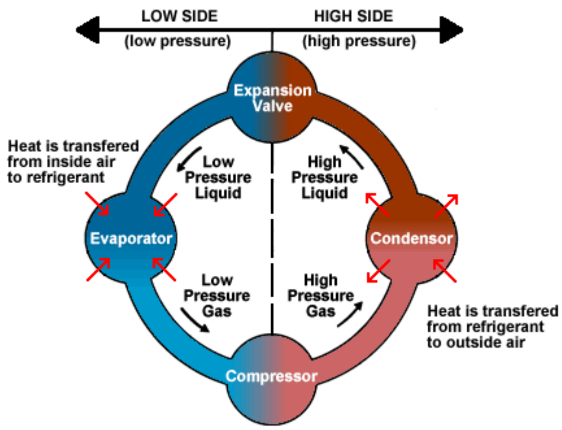


Figure 4: The Refrigeration Cycle

Over time, HVAC units degrade in operational efficiency as coil surfaces oxidize on the exterior and sometimes scale on the interior which reduces heat transfer efficiency. The moving mechanical components also wear, which further reduces the operational efficiency of the equipment. The new equipment will be installed in place of the existing equipment, including providing new refrigerant line sets for all split systems.

Advances in technology and improvements necessitated by energy code updates have led to DX equipment available today with far higher efficiencies than what was used in the past. Replacing the existing systems with new higher efficiency systems will reduce energy consumption and provide improved occupant comfort.

Site Specifics

During the audit, a heat pump condensing unit was noted with a manufacturing date from 1990. This equipment is well beyond its useful life. This measure proposes to replace the existing split system with a like-for-like replacement. As stated above, the newer system will be more efficient than the existing system and will result in slight energy savings.

HVAC Controls Optimization

General Description

The scope for this ECM involves optimizing the building HVAC controls through one or multiple controls strategies. For this project, the controls strategy recommended would be occupancy scheduling with setback temperatures.

Consistent occupied and unoccupied temperature settings will be implemented based on the building type and their needs. Occupied schedules for the HVAC controls will be set up to dictate the hours when the building is considered occupied versus unoccupied. Whenever a building enters unoccupied mode, the building HVAC controls will utilize the unoccupied settings in lieu of the occupied settings.

Site Specifics

While evaluating the Building Automation System, it was noted that a schedule was present for weekend operating hours of 8am – 11pm throughout the facility, which is contrary to the published building schedule. It was observed in the controls settings that setpoints on weekends are operating at 72F instead of setting back to 77F. If the building is truly unoccupied during the weekend, adjusting setback temperatures will result in energy savings due to the HVAC systems not operating as frequently to condition these areas when unoccupied.

Envelope Improvements

General Description

This measure proposes to add insulation to the building envelope to reduce heat transfer. Heat is transferred through opaque surfaces by thermal conduction, where thermal energy excites the molecules causing collisions which transfer heat. Heat transfer typically occurs through different layers of composite structures with differing thermal properties, with some conducting heat much more rapidly than others. The image below shows conduction through a composite wall made up of three materials with differing thermal properties.

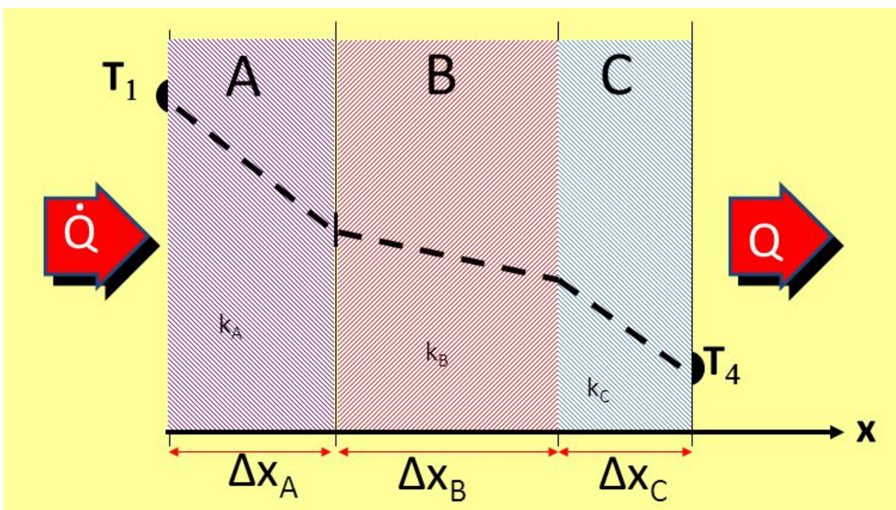


Figure 5: Conduction Through Composite Wall

While some components of the building envelope are included for structural or other needs, building insulation is required by current energy codes to reduce the amount of heat transfer and improve thermal comfort. Older buildings may have never had portions of their envelope insulated, or the insulation may have deteriorated over time or been removed. New insulation will be added to the building envelope to improve thermal comfort and reduce energy usage by the HVAC systems. When properly insulated, the heat transfer through the building envelope is reduced and the HVAC systems do not have to work as hard to maintain temperature setpoints. A properly insulated building will also reduce hot and cold spots, allowing for a more uniform temperature distribution throughout the space.

Site Specifics

At Winter Park City Hall, the insulation above the ceiling was observed during the audit to be in need of repair. Insulation will be added to the roof spanning the entire building to meet code and reduce undesired thermal transfer through the roof of the building.

Lighting Improvements

General Description

This measure involves converting older style lighting fixtures, such as fluorescent and incandescent, to modern LED lighting fixtures and lamps. Unless a building has been built or renovated in the past few years, it is common to find extensive use of fluorescent and incandescent fixtures throughout the building. Fluorescent and incandescent lighting technologies are a product of their time and often remain without intentional replacement. Older lighting technologies require more wattage to produce the same amount of light as LED fixtures. This also results in a higher heat output from the lamps which raises HVAC cooling costs.

Existing fluorescent and incandescent lighting fixtures will be replaced/retrofitted with new LED lighting fixtures. This will greatly reduce the energy required to illuminate the building. Additionally, cooling systems will have to run less often to offset the heat generated by the lighting. There are several additional benefits to LED lighting technology. LED lighting has longer burn hour life, faster on/off response time, and easier dimming capabilities compared to fluorescent and incandescent technologies. Because LED light fixtures have longer burn hour life, this will reduce the material and time cost of replacing burned out lamps.

Site Specifics

The facility was observed to have approximately half of its current fixtures be linear fluorescent fixtures with T8 lamps. Existing non-LED lighting will be replaced with new LED lighting on a one-for-one basis. Existing lighting material waste will be disposed of according to local regulations.

Facility Improvement Measures

TLC identified additional Facility Improvement Measures (FIM) that do not provide energy savings but should be addressed. By implementing the recommended FIM, the facility will experience improved equipment reliability, increased thermal comfort for occupants, and be able to operate as originally designed. While it is possible that these measures may decrease energy consumption, this has not been quantified as their purpose is focused on performance and reliability.

DX CRAC Unit Retrofit

The Liebert split system that serves the basement computer room was observed to be nearing the end of its expected useful life and in need of replacement. This measure proposes to replace the existing split system with a like-for-like replacement.

Calculation Methodology – Spreadsheet System Models

Savings for this report were evaluated using spreadsheet building models for the lighting and HVAC systems. The methodologies used for each measure are described separately in this section. Industry Standard methods of evaluation were used and are detailed in this section. Additionally, assumptions made to calculate the energy savings are detailed.

DX Unit Retrofits

Savings for this measure have been based on an improvement in the efficiency of the DX equipment. The following table shows the major inputs used in the calculation of savings for this measure.

Table 6: DX Unit Retrofit Major Inputs

Input Name	Bldg./Area Affected	Input Value	Basis of Input
CU Rated Capacity	CU	3.0 tons	Manufacturer info
CU Existing Efficiency	CU	6.46 SEER	Mfg. info and typical degradation for age
CU Proposed Efficiency	CU	14.0 SEER	Engineering judgment
Effective Full Load Hours	CU	1,600 hr./yr.	Estimate based on project location

Calculations:

Savings for this measure were based on calculating the energy consumption of the DX equipment with the existing and proposed efficiencies. The unit's energy consumption in kWh was calculated with the following formula.

$$Energy\ Consumption = Tons \times \left(\frac{12}{SEER}\right) \times Effective\ Full\ Load\ Hours$$

In the formula, the terms in the bracket yield efficiency in kW/ton.

HVAC Controls Optimization

Savings for this measure have been based on a reduction in cooling energy due to setting back non-critical portions of the building that are not always occupied. The following table shows the major inputs used in the calculation of savings for this measure.

Table 7: Controls Optimization Major Inputs

Input Name	Bldg./Area Affected	Input Value	Basis of Input
% Cooling Energy Reduction	Entire building	1%	Engineering judgment

Calculations:

Savings for this measure were based on calculating the annual cooling energy and saving a percentage of it. The existing annual cooling energy was calculated from the electric utility baseline as the sum of all the electrical consumption for each month exceeding the lowest month's consumption. The following formula was used to calculate existing annual cooling energy.

$$Existing\ Cooling\ kWh = Annual\ Total\ kWh - (12 \times Baseload\ Month\ kWh)$$

Envelope Improvements

Savings for this measure have been based on improving the insulation in the roof of the building. The following table shows the major inputs used in the calculation of savings for this measure.

Table 8: Infiltration Reduction Major Inputs

Input Name	Bldg./Area Affected	Input Value	Basis of Input
Affected Envelope Area	Entire Building	14,515	Roof area
Existing U-Value	Entire Building	0.053	Engineering judgement
Proposed U-Value	Entire Building	0.026	Engineering judgement
Heating Efficiency	Entire Building	1.10 COP	Engineering judgement
Cooling Efficiency	Entire Building	1.06 kW/ton	Manufacturer info and typical degradation
Cooling Setpoint/Setback	Entire Building	72°F/80°F	Engineering judgment
Heating Setpoint/Setback	Entire Building	70°F/60°F	Engineering judgment
Controls Occ. Schedule	Entire Building	Mon-Fri 8am-5pm	Building schedule

Calculations:

Savings for this methodology were based on using hourly temperature data for the project location. Balance points for occupied and unoccupied heating and cooling were estimated using engineering judgement. For each hour, the outside temperature was compared to the applicable balance points to determine if the HVAC system was in cooling, economizer, drift, or heating mode. Economizer mode represents when there is a cooling demand that is assisted by heat transfer through the building envelope. Drift mode occurs when there is no demand for heating or cooling. For each hour, the heat transfer in MBtu through the building envelope component was calculated with the following formula:

$$Heat\ Transfer = \frac{Area \times U\ Value \times \Delta T}{1000}$$

In the equation above, the area represented the area of the envelope component to be improved in square feet. The U-value was in units of Btu/h-ft^2-°F, while the ΔT was the temperature difference between the space setpoint and the average outside temperature. A second set of hourly calculations was performed using the proposed U-value in place of the existing U-value. The cooling energy savings in kWh was calculated for hours when in cooling or economizer modes by the following formula:

$$Energy\ Saved = \frac{(Existing\ Heat\ Transfer - Proposed\ Heat\ Transfer) \times Efficiency}{12}$$

In the formula above, the cooling efficiency was in kW/ton. The heating energy savings in therms was calculated for hours when in heating mode by the following formula:

$$Energy\ Saved = \frac{(Existing\ Heat\ Transfer - Proposed\ Heat\ Transfer)}{100 \times Efficiency}$$

In the formula above, the heating efficiency was in units of COP.

Lighting Improvements

Savings for this measure have been based on a reduction in the lighting energy based on a reduction in lighting installed wattage. The following table shows the major inputs used in the calculation of savings for this measure.

Table 9: Lighting Improvements Major Inputs

Input Name	Bldg./Area Affected	Input Value	Basis of Input
Building Area	Entire building	24,039sf	Provided value
Existing Lighting Power Density	Entire building	0.8 W/sf	Average value for 50% T8 lamps throughout
Proposed Lighting Power Density	Entire building	0.6 W/sf	Typical value for LED lamps throughout
Annual Burn Hours	Entire building	2,436	Building schedule

Calculations:

Savings for this measure were comprised of energy savings. The energy savings were the difference in the existing and proposed kWh for all the lighting fixtures in the building. The energy usage in kWh for the building was calculated using the following formula.

$$Energy\ Usage = \frac{Building\ Area \times LPD \times Hours}{1{,}000}$$

Appendix A – Lighting Line by Line

The following table shows a list of design fixtures in the building. This is not a comprehensive list of all fixtures but details a good representation. This includes only permanent fixtures and does not include any construction lighting. It is important to note that the lighting fixture schedule is from the original construction drawings (dated 1963) and may no longer be accurate.

LIGHTING FIXTURE SCHEDULE

Type	MARK	DESCRIPTION	LAMPS / FIX.	MOUNTING
FLUORESCENT	A	SMITH # PSG5005/FF/IVT	2-F40T12/WW-RS	RECESSED IN CEILING
	B	" # PSG 5197/FF/IVT	4-F40T12/WW-RS	" " "
	C	" # PSG 5501/FF/IVT	2-F20T12/WW-RS	" " "
	D	DAYBRITE # 4-644-593	4-F40T12/WW-RS	" " "
	E	SMITH # M6490/FF/IVT	2-F40T12/WW-RS	CEILING SURFACE
	F	" # M5095/FF/IVT	2- "	RECESSED IN CEILING
	G	" # M5160/FF/IVT	4- "	" " "
	H	SOUTHERN # 10896	2-F96T12/WW	CEILING SURFACE
	I	" # 10248-RS	2-F40T12/WW-RS	" "
	J	PRESCOLITE # 3291	2 "	WALL O.B. AT TOP OF MIRROR
	K	ALKCO # 7124	2-F30T8/CW	M'T'D. IN LUMINOUS PANEL IN COMM. RM.
	L			
	M			
	N			
INCANDESCENT	A	LIGHTOLIER # 7792	1-150W/IF-A-23-130V.	RECESSED IN C'L'G.
	B	" # 7751	1-75W/IF-130V.	" " "
	C	ARTMETAL # 5801 AB	1-75R30/FL.	C'L'G. SURF. M'T'D.
	D	" " # 3131	1-75W/IF-130V.	" " "
	E	HALO H2-25	1-150W/IF-130V.	RECESSED IN C'L'G.
	F	" H1-15	1-100W/IF-130V.	" " "
	G	PAULDING #1531-A1	1-150W/IF-130V.	WALL OR CEILING O.B.
	H	LIGHTOLIER # 6399	4-60W/IF-130V.	CEILING SURF.
	I	McPHILBEN # 5?R-LF [illegible]	2-F6T5/CW	RECESSED IN WALL OVER DOOR
	K	PRESCOLITE # WB-7073	2-75R-30/FL	WALL O.B., 72" ABOVE FIN. GR.
	L	LIGHTOLIER # 7859/7821	1-150W/IF-130V.	RECESSED IN C'L'G.
	N	GOTHAM # 587R	1-150W R40/FL-130V.	" " "
	P	" # 5127 PS-MF	1-150W/IF-130V.	" " "
	Q	LIGHTOLIER # 51?40/61?55/61?57/51?58	3-100W/IF-130V.	SUSP. FROM CEILING O.B.
	R	IMPERIAL # 529	4-40W/IF-130V.	WALL O.B. AT TOP OF MIRROR
	U	McPHILBEN # 82-801APG-AL-HS-RS	1-150W/IF-1-10W/IF	WALL SURF. AT INTERSECTION WITH CEILING SLAB
	V	" # 55-410-AL	DITTO LAMPS	CEILING SURFACE
EXIT	A	ALKCO # RGC-210-GREEN	2-F8T5/CW	RECESSED IN CEILING
	B	" # RGC-210-2-LR-GREEN	2- "	" " "
	C	" # RPW-210-R-GREEN	2- "	" " WALL, 78" ABOVE FIN. FL.
	D	" # RPW-210-GREEN	2- "	" " " OVER DOOR
	E	" # EGO-12-FL-2	2-F6T5/CW	WALL O.B. 84" ABOVE FIN. FL.
FLOOD	A	KIM # C10	1-50R-20/FL	MTD. ON # J-1½ UNDERGR'D. BOX
	B	" # C-41	1-150 R-40/FL	SEMI-RECESSED IN GROUND
	C	" # C-21	1-75R-30/FL	MTD. ON # J-1½ UNDERGR'D. BOX
	D	" # C-22	1-F15T8/BL	" " " " "
	E	" # C-52	1-150 R 40/FL	RECESSED IN GROUND
	F	MOE-LITE # 590F	1-500 T30/CL	RECESSED IN PIT, SEE DETAIL
	G			
	H			

Appendix B – Mechanical Equipment

The following table shows a listing of all recorded major equipment in the building.

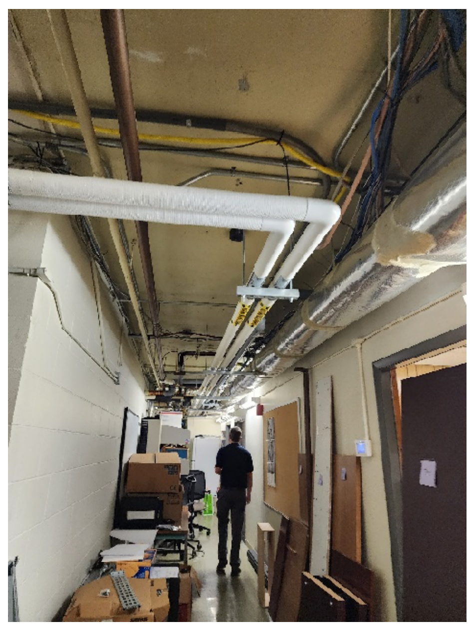
Building	Type	Equip	Location Served	Tag	Qty	Capacity	Units	Make	Model	Serial Number	Year
City Hall	AHU	Air Handling Unit		AHU-S-1	1	7 1/2	HP	Trane	CSAA017UAC00	K11K09398A	2011
City Hall	AHU	Air Handling Unit - Challenger 3000			1	*	HP	Liebert	*	*	
City Hall	WH	Water Heater - 85 Gallons			1	9.0	kW	Rheem	ES85-9-6	0905E00128	2005
City Hall	Chiller	Chiller			1	80	Ton	Trane	*	205037	
City Hall	Pump	Condenser Water Pump			1	7 1/2	HP	*	*	*	2012
City Hall	AHU	Air Handling Unit			1	1/2	HP	Trane	TAM4A0C48S41SAA	112620JM2V	2011
City Hall	AHU	Air Handling Unit			1	1/2	HP	Trane	TAM4A0C48S41SAA	11303SDS2V	2011
City Hall	AHU	Air Handling Unit		AHU-SC-1	1	*	HP	Trane	CSAA008UAC00	K11K09418A	2011
City Hall	AHU	Air Handling Unit		AHU-S-2	1	*	HP	Trane	CSAA012UAC00	K11K09405A	2011
City Hall	CU	Condensing Unit			1	5.00	Ton	Trane	4TTA3060D3000AA	11181TRE5F	2011
City Hall	CU	Condensing Unit			1	7	Ton	Liebert	CSF 083LP	993500111951	1999
City Hall	CU	Condensing Unit			1	4.00	Ton	Trane	4TTA3048D3000AA	112020N15F	2011
City Hall	CU	Condensing Unit			1	4.00	Ton	Trane	4TTA3048D3000AA	11294PBT5F	2011
City Hall	CU	Condensing Unit			1	5.0	Ton	Goodman	GSX130613AA	1303263412	2013
City Hall	CU	Condensing Unit			1	5.0	Ton	Goodman	GSX140601KD	1911724120	2019
City Hall	CU	Condensing Unit - Heat Pump			1	3.0	Ton	Trane	TWD736B100A0	E40248489	1990
City Hall	CT	Cooling Tower			1	80.0	Ton	Evapco	ICT 4-96	4-110124	
City Hall	B	Boiler		Boiler-1	1	*	*	PK	*	*	
City Hall	CHWP	Chilled Water Pump		CHWP-1	1	*	*	*	*	*	
City Hall	CHWP	Chilled Water Pump		CHWP-2	1	*	*	*	*	*	
City Hall	HWP	Hot Water Pump		HWP-1	1	*	*	*	*	*	

Appendix C – Site Walkthrough Photos

C-1: Exterior lighting

C-2: Entrance of City Hall

C-3: Exterior walls



C-4: Chill water pipes

 C-5: AHU-S-1	 C-6: Bathroom lighting and sink fixture
 C-7: Fire room	 C-8: Challenger 3000 AHU

C-9: Water heater

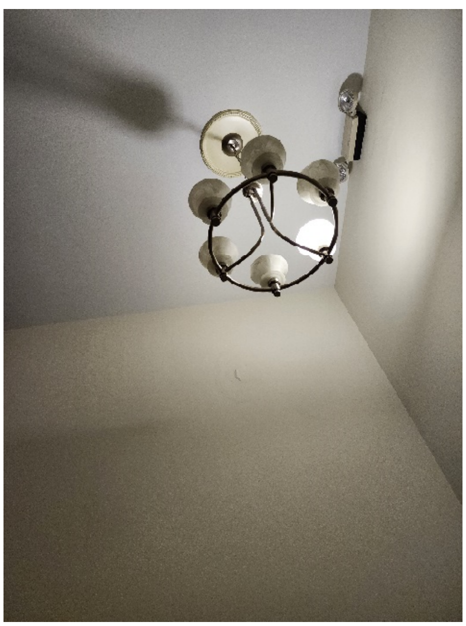
C-10: Boiler

C-11: Condenser water pump

C-12: Chiller

C-13: Conference room

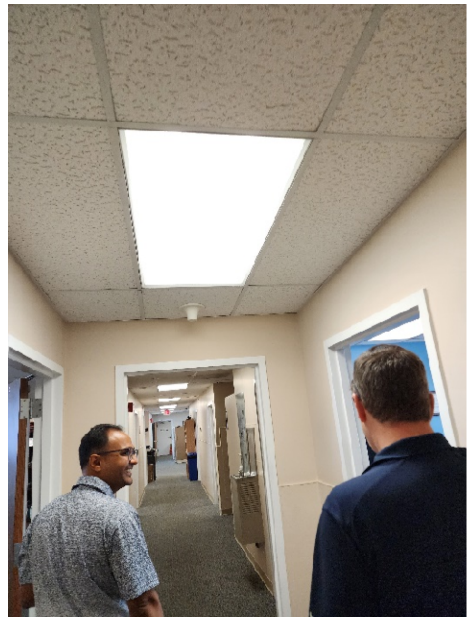
C-14: Portable AHU



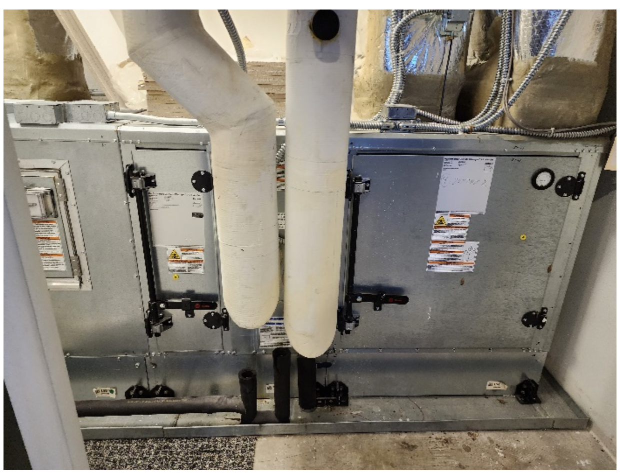
C-15: Lighting fixture

C-16: Air handling units

C-17: Shower



C-18: Flourescent lighting fixture



C-19: AHU-SC-1

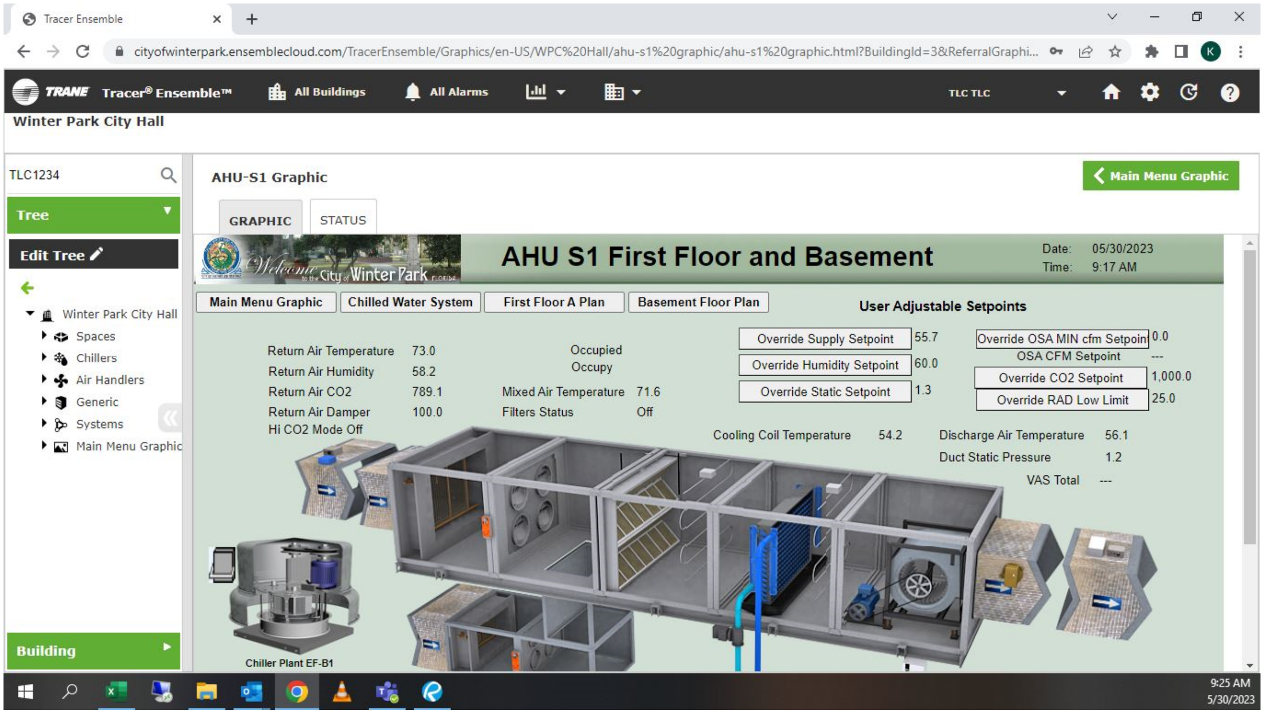
C-20: AHU-S-2

C-21: Trane condensing unit

C-22: Liebert condensing unit

C-23: Condensing units

C-24: Cooling tower


Tracer Ensemble
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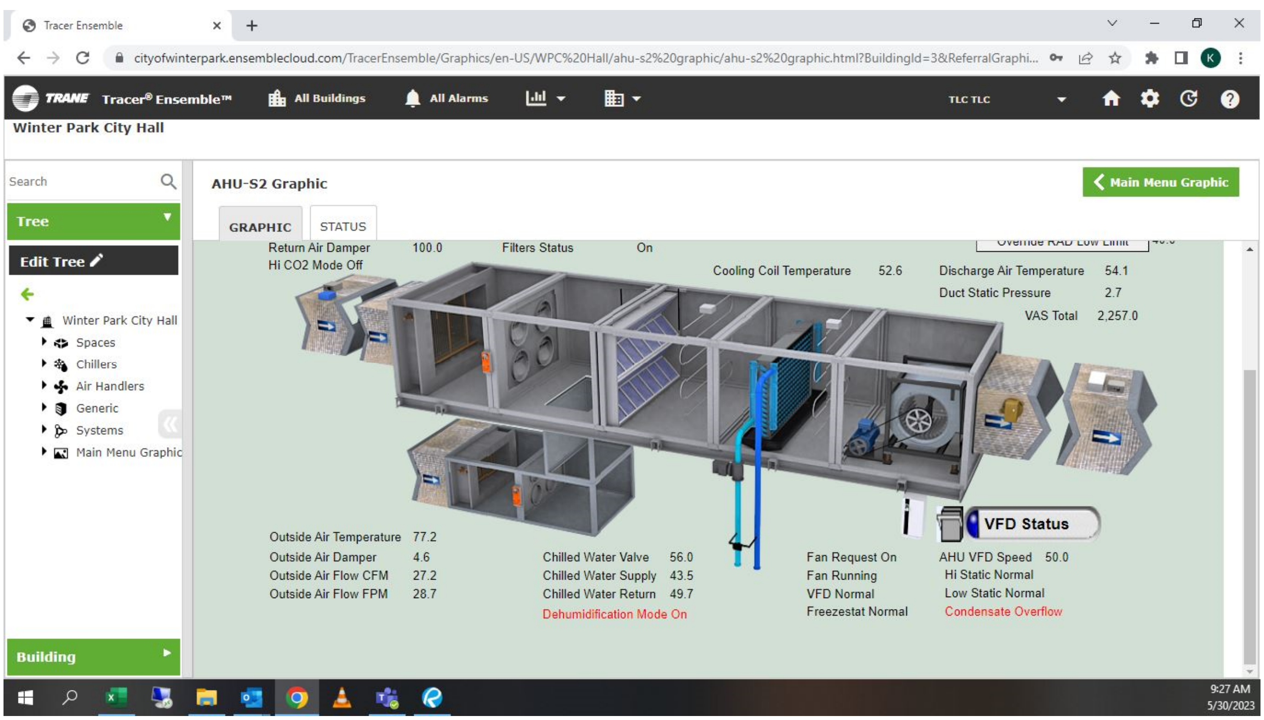
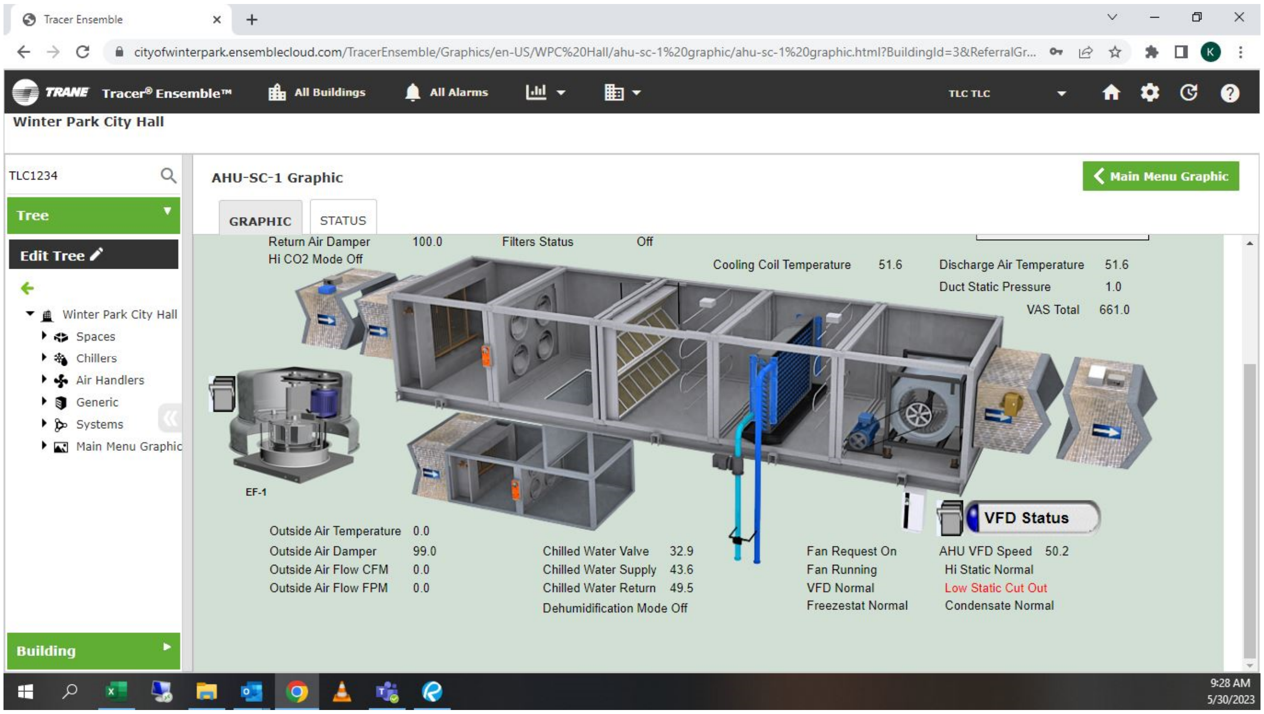
TRANE Tracer® Ensemble™
All Buildings
All Alarms
TLC TLC
Winter Park City Hall
TLC1234
Tree
Edit Tree
Winter Park City Hall
Spaces
Chillers
Air Handlers
Generic
Systems
Main Menu Graphic
Building
AHU-S1 Graphic
Main Menu Graphic
GRAPHIC
STATUS
AHU S1 First Floor and Basement
Date: 05/30/2023
Time: 9:17 AM
Main Menu Graphic
Chilled Water System
First Floor A Plan
Basement Floor Plan
User Adjustable Setpoints
Override Supply Setpoint 55.7
Override Humidity Setpoint 60.0
Override Static Setpoint 1.3
Override OSA MIN cfm Setpoin 0.0
OSA CFM Setpoint ---
Override CO2 Setpoint 1,000.0
Override RAD Low Limit 25.0
Return Air Temperature 73.0
Return Air Humidity 58.2
Return Air CO2 789.1
Return Air Damper 100.0
Hi CO2 Mode Off
Occupied
Occupy
Mixed Air Temperature 71.6
Filters Status Off
Cooling Coil Temperature 54.2
Discharge Air Temperature 56.1
Duct Static Pressure 1.2
VAS Total ---
Chiller Plant EF-B1
9:25 AM
5/30/2023

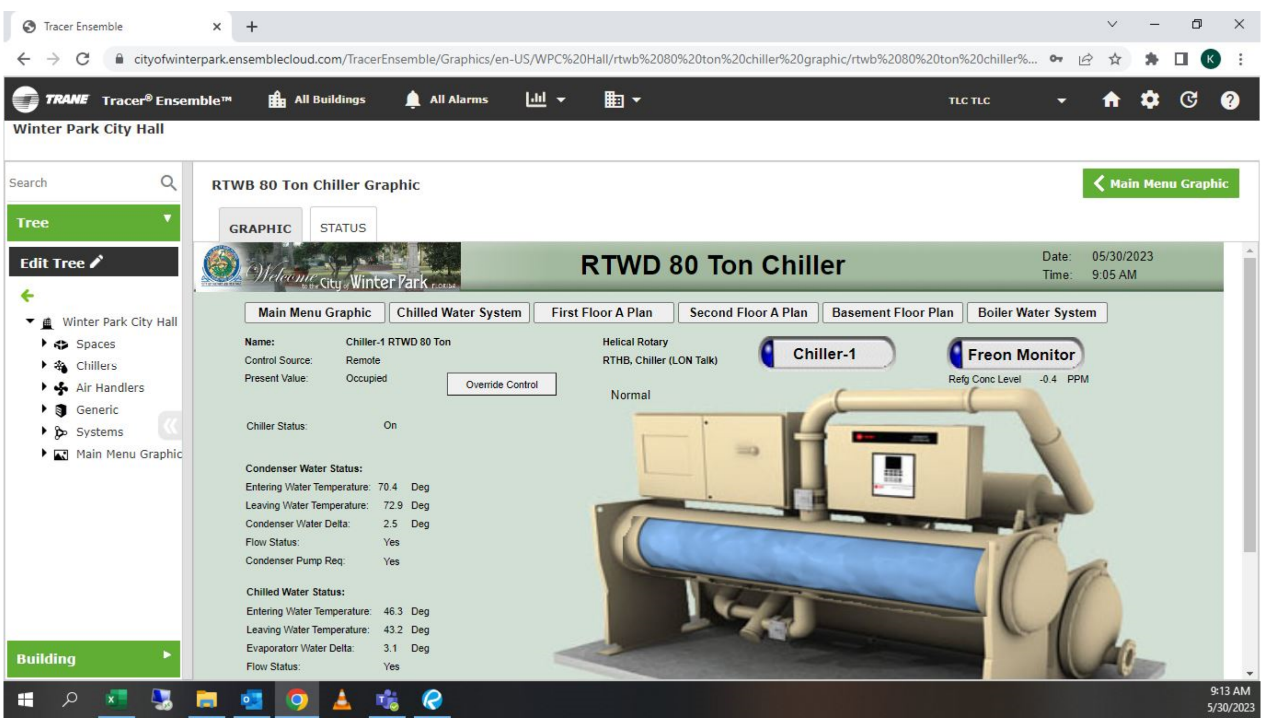
AHU-S1


Tracer Ensemble
cityofwinterpark.ensemblecloud.com/TracerEnsemble/Graphics/en-US/WPC%20Hall/ahu-s2%20graphic/ahu-s2%20graphic.html?BuildingId=3&ReferralGraphi...
TRANE Tracer® Ensemble™
All Buildings
All Alarms
TLC TLC
Winter Park City Hall
Search
Tree
Edit Tree
Winter Park City Hall
Spaces
Chillers
Air Handlers
Generic
Systems
Main Menu Graphic
Building
AHU-S2 Graphic
Main Menu Graphic
GRAPHIC
STATUS
Return Air Damper 100.0
Hi CO2 Mode Off
Filters Status On
Cooling Coil Temperature 52.6
Discharge Air Temperature 54.1
Duct Static Pressure 2.7
VAS Total 2,257.0
VFD Status
Outside Air Temperature 77.2
Outside Air Damper 4.6
Outside Air Flow CFM 27.2
Outside Air Flow FPM 28.7
Chilled Water Valve 56.0
Chilled Water Supply 43.5
Chilled Water Return 49.7
Dehumidification Mode On
Fan Request On
Fan Running
VFD Normal
Freezestat Normal
AHU VFD Speed 50.0
Hi Static Normal
Low Static Normal
Condensate Overflow
9:27 AM
5/30/2023

AHU-S2



AHU-SC-1



Chiller