9/29/2023

Winter Park
Ward Park Ball Fields

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 Ward Park Ballfields 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 facility 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. 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 B 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) and Facility Improvement Measures (FIMs). 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

ASHRAE Level II Audit of the Ward Park Ballfields.
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General Facility Description

The Ward Park Ballfields consists of nine (9) baseball/softball fields, and five (5) multipurpose football/soccer fields. The park itself includes several standalone restrooms, Showalter Stadium, and concession stands. However, these structures have been included in the general Ward Park report. An aerial view of the complex is shown below.

Figure 1: Aerial View of the Ward Park Ballfields

Mechanical Systems

Due to the nature of the Ballfields, no mechanical systems are present for analysis. For information related to the structures within Ward Park, please refer to the Ward Park audit report.

Building Controls

No building controls are associated with the fields themselves. For information on the building controls associated with the buildings within Ward Park, please refer to the Ward Park audit report.

Lighting Systems

As an outside sports facility, Ward Park includes high-intensity exterior lighting to accommodate events after sundown. Each baseball/softball, football, and soccer field is equipped with metal halide lights controlled via turn switch near the electrical meter.

Domestic Water Fixture (Plumbing) Systems

No water fixtures were evaluated during the audit of the ballfields as the structures within the park were included in the Ward Park audit report.

Key Operating Parameters

The park is currently operated 8am to 8pm every day. Events can be scheduled with the City after normal closing hours to reserve a field with operation of the lights.

Site Visit

The site was audited by TLC engineers 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 facility is currently provided with electricity and water utilities by the City. Electrical utility consumption values were provided for the months of January 2021 through June 2023. The monthly consumption profile is as expected, where values increase in the months where the ballfields are in use for the regular softball/baseball season. 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)	53,815
Annual Electrical Cost	-

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

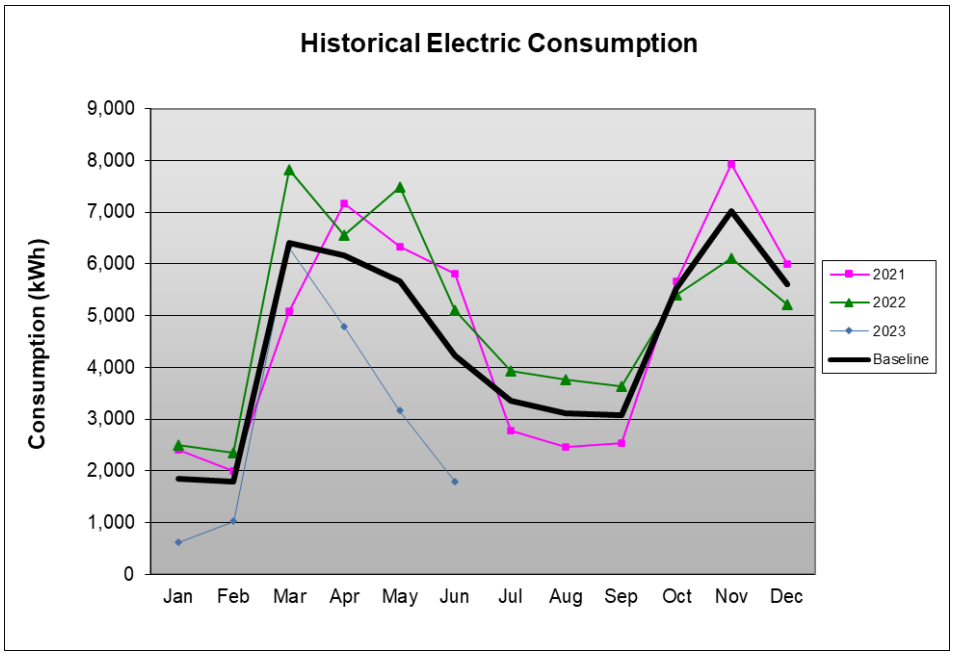


Figure 2: Ward Park Ballfields Electric Consumption

Table 2: Ward Park Ballfields Electricity Consumption Data

Date	Consumption (kWh)	Demand (kW)
Jan-21	2,413	90.6
Feb-21	1,993	48
Mar-21	5,089	183
Apr-21	7,176	205.2
May-21	6,325	205.8
Jun-21	5,810	188.4
Jul-21	2,783	171.6
Aug-21	2,457	15.6
Sep-21	2,534	27
Oct-21	5,663	100.2
Nov-21	7,931	103.2
Dec-21	5,990	101.4
Jan-22	2,492	67.8
Feb-22	2,358	26.4
Mar-22	7,822	103.8
Apr-22	6,559	102
May-22	7,483	102
Jun-22	5,106	85.2
Jul-22	3,935	85.8
Aug-22	3,760	7.938
Sep-22	3,627	61.74
Oct-22	5,405	100.89
Nov-22	6,117	103.212
Dec-22	5,212	103.212

Date	Consumption (kWh)	Demand (kW)
Jan-23	618	103.212
Feb-23	1,026	103.212
Mar-23	6,330	103.212
Apr-23	4,780	103.212
May-23	3,161	103.212
Jun-23	1,783	103.212

Benchmarking

Throughout the auditing process, TLC compared energy consumption of various facilities utilizing a common benchmark to gauge how the building compares to similar ones nationally. The main means of comparison is the Energy Use Intensity (EUI), which is used by energy engineers to determine overall energy consumption to a common unit of measure. The Energy Use Intensity measures annual consumption of electricity per square foot, in kBTU/sf/year. However, EUI comparison depends upon measuring energy consumption on a per-square foot basis. Due to the nature of the Ballfields facility, benchmarking via EUI is not possible. Despite this limitation, the ECM detailed later in this report will serve to decrease the energy consumption of the Ward Park Ballfield systems.

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 $0.2242/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	$0.2242/kWh

Energy Saving Opportunities

The operation and condition of equipment at the Ward Park Ballfields 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)
Exterior Lighting Improvements	ECM	High Cost	206,100	$46,208	$248,202	5.4

*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.

Exterior Lighting Improvements

General Description

This measure involves converting older style exterior lighting fixtures, such as metal halides, to modern LED lighting fixtures and lamps. Unless a building has been built or renovated in the past few years, metal halides are common to find for exterior fixtures and highbay fixtures in large assembly spaces. Metal Halide lighting fixtures 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.

Existing metal halide lighting fixtures will be replaced/retrofitted with new LED lighting fixtures. This will greatly reduce the energy required to illuminate the exterior of the building. 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 metal halides. 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 metal halide fixtures for its exterior lights. 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.

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.

Exterior 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 6: Exterior Lighting Improvements Major Inputs

Input Name	Bldg./Area Affected	Input Value	Basis of Input
Quantity of Fixtures	Exterior Lights	229	Existing Quantity of Fixtures
Existing Fixture Wattage	Exterior Lights	1000 W	Typical value for Metal Halide fixtures
Proposed Fixture Wattage	Exterior Lights	400 W	Typical value for exterior LED fixtures
Annual Burn Hours	Exterior Lights	1,500	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.

$$Energy\ Usage = \frac{Quantity\ of\ Fixtures \times Fixture\ Wattage \times Hours}{1{,}000}$$

Appendix A – 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
Ward Ballfields	A/C	Window Air Conditioner			1	0.7	Tons	GE Appliances	AEC08LYL1	AM157585P	
Ward Ballfields	A/C	Packaged Air Conditioner			1		Tons	Lenox			

Appendix B – Site Walkthrough Photos

C-1: Ballfield Restroom

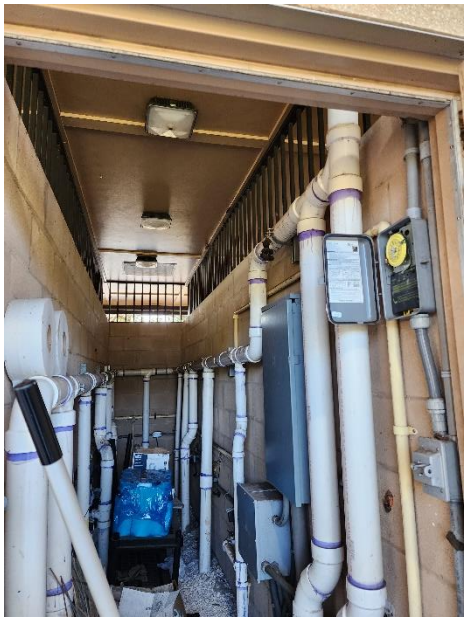
C-2: Ballfield Lights

C-3: Soccer Field Lighting Controls

C-4: Concession Stand Window AC

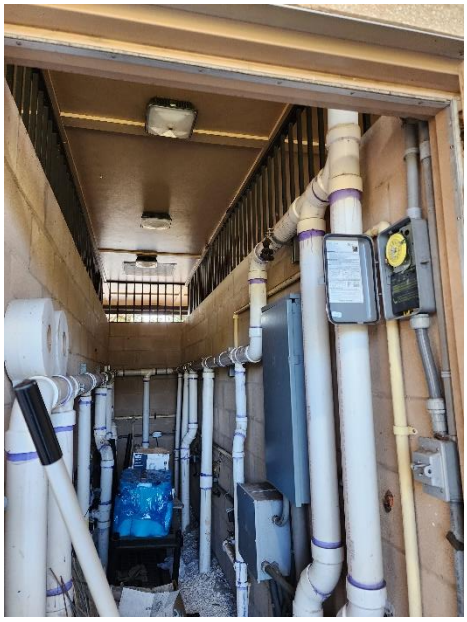
C-5: Conference/Storage Interior

C-6: Conference/Storage Packaged A/C



C-5: Restroom Plumbing Chase

C-6: Conference/Storage Packaged A/C

 C-7: Restroom Plumbing Chase	