



# Indiana Area School District Senior High School Building Energy Profile



July 29, 2011  
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Building Name: Indiana Area Senior High School

Building Location: 450 North 5<sup>th</sup> Street  
Indiana, Pennsylvania 15701

Building Representative: Dale Kirsch/Business Manager  
Greg Trout/Supervisor of Buildings and Grounds

Profile Generation Date: July 29, 2011

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## Building Energy Profile

### Summary

This report is an overview of the building and operations at Indiana Area School District/Senior High School. Key energy and performance benchmarks are captured from utility billing information provided by the site contacts and from observations made during the building assessment.

This facility incurs approximately \$244,436.49 in annual utility costs. The site energy use index is approximately **95** kBtu/sf-year. According to the *Commercial Building Energy Consumption Survey*, US Energy Information Administration (Source: Data adapted from DOE-EIA.), the average EUI for K-12 schools with approximately 191,000 square footage with walk-in coolers/refrigeration is **95**.

This facility's energy performance rating is **49**.

### Acknowledgement

AllFacilities Energy Group gratefully acknowledges the support and assistance Dale Kirsch/Business Manager Indiana Area School District and Greg Trout/Supervisor of Buildings and Grounds.

### Abbreviations

The following abbreviations may be found on these pages:

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<b>kGal</b>	1,000 gallons (of water). Unit of measurement used by your water company
<b>DHW</b>	Domestic Hot Water – Water heated and used for domestic related purposes, such as washing hands, etc. (water from the hot water heater).
<b>EUI</b>	Energy Use Index – total energy (electricity and fossil fuels) consumed per square foot. This value is used to compare and benchmark facilities.
<b>HVAC</b>	Heating, Ventilation, Air Conditioning – Equipment used to heat, cool and provide air flow to the building.
<b>kBtu</b>	One thousand Btus (British thermal units). Standard unit of measurement of energy (can be used for both electric and fossil fuels) often used in benchmarking comparisons.
<b>kWh</b>	One thousand Watt hours (of electricity consumed). Unit of measurement used by the electric company.
<b>kcf</b>	One thousand cubic feet of natural gas (on utility bills, <b>mcf</b> is often used by the natural gas companies to mean 1,000cf)

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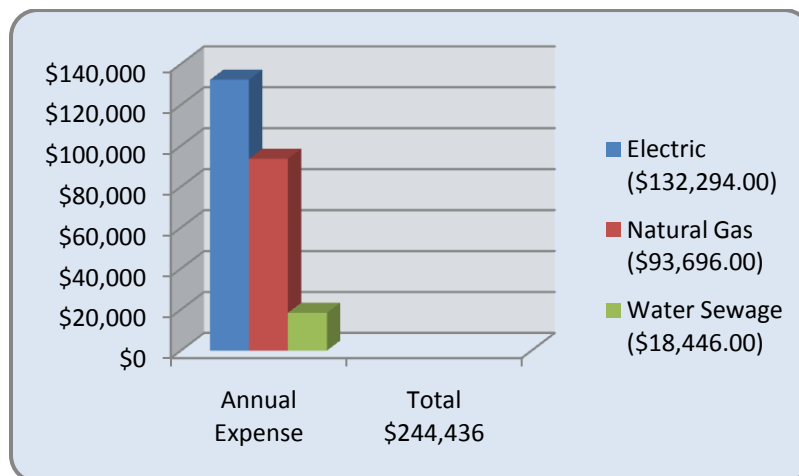
### Building Energy Profile



#### Utility Data

##### Energy Cost Breakdown by Utility

<b>NATURAL GAS (Dominion-Peoples/Amerada)</b> <i>Account# not provided</i> <i>Meter# not provided</i>	<b>\$ 93,696.00 (7/10 to 6/11)</b>
<b>ELECTRICITY (Penelec/Amerada)</b> <i>Account# 10 00 01 8053 7 1</i> <i>Meter# L97024155</i>	<b>\$ 132,294.00 (7/10 to 6/11)</b>
<b>WATER (Pennsylvania American Water)</b> <b>SEWAGE (Indiana Borough and White Township)</b> <i>Account# not provided</i> <i>Meter# not provided</i>	<b>\$ 18,446.00 (7/10 to 6/11)</b>
<b>Total Utility Cost</b>	<b>\$244,436.00</b>
<b>Total Square Footage</b>	<b>191,203 SF</b>
<b>Average Utility Cost Per Square Foot*</b>	<b>\$1.28</b>



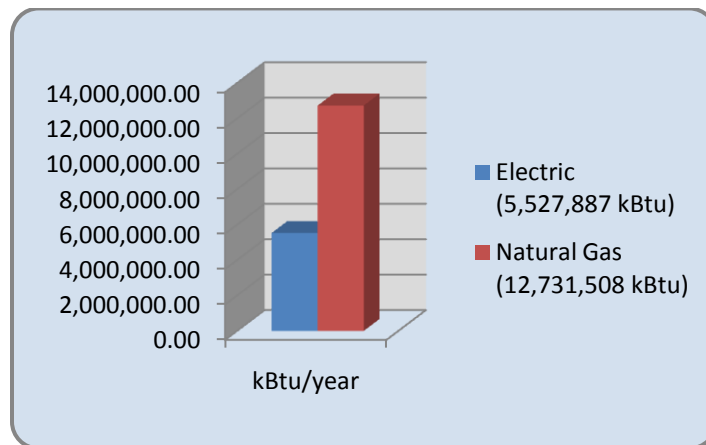


### Building Energy Profile

\*According to the *American School and University Annual Maintenance Survey 2008*, the average cost per square foot for all utilities, for all types of schools (including heavy energy users such as high schools with swimming pools) and including all utility costs in the US (of which Pittsburgh is in the bottom 25%) should be at **\$1.90**  
 Based on 12 months of utility data provided, this facility is currently at **\$1.28** per square foot for all utilities.

#### Annual Utility Use

<b>Annual Electricity use in kWh</b>	<b>1,620,131 kWh/year</b>
<b>Annual Electricity use in kBtu</b>	<b>5,527,886.97 kBtu/year</b>
<b>Account#</b>	
<b>Meter#</b>	
<b>Maximum Demand (in kW)</b>	<b>480 kW during July 2010</b>
<b>Annual Natural Gas use in kcf*</b>	<b>12,372.7 kcf/year</b>
<b>Annual Natural Gas use in kBtu</b>	<b>12,731,508.3 kBtu/year</b>
<b>Account#</b>	
<b>Meter#</b>	
*Note: it has been confirmed with the supplier that consumption is expressed in MCF on the bill, which is normally <i>million cubic feet</i> , but is actually 1,000 cubic feet (kcf) in this instance.	
<b>Annual Water use in kGals</b>	<b>1,466 kGal/year</b>
<b>Account#</b>	
<b>Meter#</b>	
<b>Energy Use Index (EUI) electric and gas (expressed as kBtu/sq.ft.-year)</b>	<b>**95</b>





## **Building Energy Profile**

\*\* Energy auditors use a measure called Energy Use Index (EUI) to enable comparisons between different buildings and energy types. EUI is calculated by converting all energy used in a building to a common unit, BTUs, and then dividing it by the square footage of the heated/ cooled space in the building. The EUI is the most common means of expressing the total energy consumption for each building. The EUI is usually expressed in *BTUs/Square Foot-Year* and can be used to compare energy consumption relative to similar building types or to track consumption from year to year in the same building. Sometimes EUI is given as thousands of BTU/square foot-year.



## Building Energy Profile

### Target Energy Performance Results

The design must achieve a rating of 75 or higher to be eligible for "Designed to Earn the ENERGY STAR".

NOTE: Values are 30% Electricity - Grid Purchase and 70% Natural Gas. The Target & Average Building energy use for this facility are calculated based on fuel mix of input estimated energy use.

Target Energy Performance Results (estimated)			
Energy	Design	Target	Average Building
<a href="#">Energy Performance Rating (1-100)</a>	49*	75	50
<a href="#">Energy Reduction (%)</a>	N/A	22	0
<a href="#">Source Energy Use Intensity (kBtu/Sq. Ft./yr)</a>	166	129	165
<a href="#">Site Energy Use Intensity (kBtu/Sq. Ft./yr)</a>	**95	74	95
<a href="#">Total Annual Source Energy (kBtu)</a>	31,793,031	24,666,314	31,542,767
<a href="#">Total Annual Site Energy (kBtu)</a>	18,259,395	14,166,374	18,115,663
<a href="#">Total Annual Energy Cost (\$)</a>	\$ 312,491	\$ 242,443	\$ 310,031
Pollution Emissions			
<a href="#">CO2-eq Emissions (metric tons/year)</a>	1,460	1,133	1,449
<a href="#">CO2-eq Emissions Reduction (%)</a>	-1%	22%	0%

### Facility Information

15701  
United States

Facility Characteristics		Estimated Design Energy			
Space Type	Gross Floor Area (Sq. Ft.)	Energy Source	Units	Estimated Total Annual Energy Use	Energy Rate (\$/Unit)
K-12 School	191,203	Electricity - Grid Purchase	kBtu	5,527,887	\$ 0.027/kBtu
Total Gross Floor Area	191,203	Natural Gas	kBtu	12,731,508	\$ 0.013/kBtu

\* The Average Building is equivalent to an EPA Energy Performance Rating of 50.

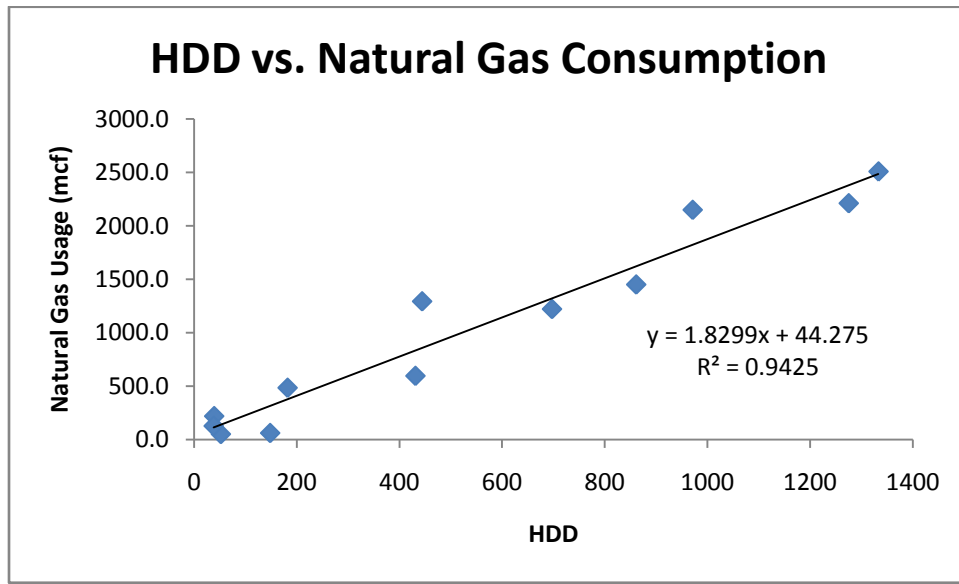
Source: Data adapted from DOE-EIA.



### Building Energy Profile

#### Utility Costs per Unit

Electricity Cost per Unit	\$ .08 per kWh
Natural Gas Cost per Unit	\$ 7.82 per kcf
Water/Sewage Costs per Unit	\$ 12.58 per kGal



Linear regression analysis determines the relationship between the weather and building energy use. Generally, an R squared value of 0.80 or above indicates that there is a good relationship between weather and building energy use. The R squared value is 94 for this facility. The natural gas load is directly proportional to outdoor air temperature and the gas load of the building primarily serves the HVAC system for heating.

#### Maintenance & Operations Costs per Area

(Expressed in median dollars per square foot)

Total Energy/Utilities	\$ 1.28
Gas/Electricity/Other Fuels	\$ 1.20
Other Utilities	\$ 0.08



## Building Energy Profile



### Building Profile

Building Use:	Senior High School/Grades 10-12
Class:	Public School
Anchor Tenant:	Indiana Area School District
Setting:	Indiana, Pennsylvania

### Utilities

Electric:	Penelec/Amerada
Natural Gas:	Dominion Peoples/Amerada
Water:	Pennsylvania American Water
Sewage:	Indiana Borough and White Township

Number of Full Time Staff: 98

Number of Students: 660 (October 2010)  
875 (projected 2011/2012)

Year Constructed: 1963

Renovations/Additions: 1990 Robert T. Scheeren Architects/Indiana, Pennsylvania  
2008 (Gymnasium/Fitness Center )Thomas R. Harley, Architects

Days Occupied: Days: 178 student days, 185 teacher days, 260 days for office and custodial staff

Hours of Operation: Senior High School students start at 7:40 a.m. and dismiss at 2:36 p.m. Teachers begin at 7:30 a.m. and dismiss at 3:30 p.m. Office staff work 7:30 to 4:00 during the school year and 7:30 to 3:30 during the summer months. Saturdays are frequent for days and time throughout the year.

Energy Performance Rating for this facility: **49\***

\*To be eligible for the Energy Star, facilities must obtain a rating of at least 75



## Building Energy Profile

### **Building Area**

(Total square footage and descriptions/operating characteristics of each major space)

Gross floor area:	191,203
Building Type:	Brick/Masonry with flat roof
Number of Stories:	2
Basement:	Yes
Roofing System:	EPDM Membrane with Tectum or gypsum type deck supported by steel bar joists.



Year Installed:	1991/approximately 20 years old (roof is leaking and in poor condition)
Roof Insulation:	Information not provided in building plans
Windows:	Aluminum Frame/double pane





## Building Energy Profile

### Building Envelope

As indicated on design drawings.

#### **(Approximately 7,400 sq. ft)**

Basement unit B; electrical systems room, mechanical systems room, storage, two stairways

#### **(Approximately 122,540 sq. ft units A, B, C, D, and new addition)**

Unit A level one; Main Entrance 3 double doors leading to lobby, 3 interior stairways, 18 classrooms, 4 conference rooms, 2 computer resource rooms, food and nutrition instructional, clothing and textiles, and copy room.

Unit B level one; 6 laboratory/classrooms, receiving storage, mechanical rooms, administration offices, nurse office, elevator, 4 stairways, 1 restroom, 5 entry/exit doors (3 double)  
(upper level boiler room, electrical vault, storage, two stairways)

Unit C; level one, auditorium with stage, library, classrooms (health/driver education and drama/english), conference room, group instruction/lecture room, music rooms including music library, 4 restrooms, storage rooms, offices, entry with lobby, 7 entry exits, elevator, four stairways

Unit D; level one, gymnasium with auxiliary gymnasium, locker rooms with shower and restrooms, equipment rooms, training rooms, 3 offices, band and music room, storage rooms and 2 public restrooms

New Addition level one; drafting classroom, elevator, locker room, multipurpose room, 2 restrooms, 2 stairways, storage rooms

#### **(Approximately 61,250 sq. ft units A, B, and new addition)**

Unit A level two; 23 classrooms, 4 laboratories (biology, chemistry, science), 3 resource offices, 3 interior stairways.

Unit B level two; cafeteria, kitchen with separate walk-in freezer/refrigerator, dishwasher room, dry food storage, office, storage, elevator, one stairway, one single occupant employee restroom.

New Addition level two; fitness center, upper gymnasium, 2 restrooms, 2 stairways, storage rooms





## Building Energy Profile

### Facilities & Equipment

Auditorium Unit C - level one with stage

Cafeteria Unit B - level two



Classrooms 57

Computer Labs 2- Unit A – level one

Elevator/Lifts 2 – elevators, one near library (older) and a second near new addition

1 – chair lift located near library



1- elevator, serving unit B and C first and second levels

Gymnasium Unit D and new addition



Industrial Arts Unit A - level two

Kitchen Unit B - level two; cafeteria and kitchen with separate walk-in freezer/refrigerator

### Building Energy Profile

Library (2) Unit C – level one; high school library and music library off band/music room

Locker Rooms Unit D and new addition



Misc. Rooms Unit B - level one; administration offices, nurse office, mechanical and storage rooms  
 Unit C – level one; conference rooms and group instruction/lecture rooms

Restrooms; (27)

First Floor	Unit A (6)	(1) boy's - 2 sinks, 2 toilets, and 4 urinals (1) girl's - 2 sinks and 3 toilets (1) boy's - 1 sink, 1 toilet, and 1 urinal (1) girl's - 1 sink and 1 toilet (1) faculty men's - 1 sink, 1toilet, and 1 urinal (1) faculty women's - 1 sink and 2 toilets
Second Floor	Unit A (6)	(2) boy's - 2 sinks, 2 toilets, and 4 urinals (2) girl's - 2 sinks and 3 toilets (2) single occupant - 1 boys/1girls (1 sink and 1 toilet each)
	Unit B (1)	(1) single occupant - 1 sink and 1 toilet
	Unit C (4)	(1) men's - 1 sink, 2 toilets, and 2 urinals (1) men's – 2 sinks, 2 toilets, and 3 urinals (1) women's – 3 sinks and 2 toilets (1) women's – 1 sink and 2 toilets
	Unit D (6)	(2) single occupant - 1 sink and 1 toilet each (4) locker rooms with showers (54 shower heads, 10 sinks, 10 toilets, and 8 urinals)



### Building Energy Profile

Addition (4)

- (Level 1) (1) men's - 1 sink, 1 toilet, and 2 urinals  
(1) women's - 2 sinks and 4 toilets
- (Level 2) (1) men's - 1 sink, 1 toilet, and 1 urinal  
(1) women's - 2 sinks and 3 toilets

*Total fixtures; 54 shower heads, 42 sinks, 47 toilets, and 26 urinals*



### Food Service

Kitchen (2) Walk-n Freezer (unit B second floor)

Walk-in Refrigerator (unit B second floor)

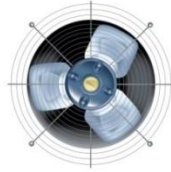
Home Economics Classroom

(1) General Electric/oven/model# JGBS23DEM3WW  
115v/5 amp/45,000 BTU

(1) General Electric/oven/model# JGBP28GEV2WH  
115v/5 amp/55,000 BTU

*Primary cooking equipment fuel source; electric kitchen*

## Building Energy Profile



### HVAC SYSTEMS

**Heating:**

Boilers

**Cooling:**

Air Cooled Chiller

**Air Distribution:**

Air Handling Units

Systems

(2) H.B. Smith and Bryan Boilers/series 4500 cast iron with power flame C5 burner. Installed 1990 (Unit B basement mechanical room)



(2) - Bryan Boilers coupled to three storage tanks  
(model# and age not identified in building plans)



### Building Energy Profile

(5) Air Handling Units (roof top) installed 1990  
(mfg. and model#not identified in building plans)



(14) RTU HVAC Units installed 1990  
(mfg. and model#not identified in building plans)



(6) Cabinet and Wall Heaters  
(mfg. and model#not identified in building plans)



Air Cooled Chiller/model# not identified/ 200 ton with ice storage



DX Air Conditioning Systems/model#, age (offices)  
(new addition)

Hot Water and Chilled Water distribution system

**Building Energy Profile**

pumps 480v/3ph(mfg. and model#not identified in building plans)

Classroom Exhaust Hoods



Exhaust Fans installed 1990



Unit Ventilators installed 1990



Air Compressor with dryer installed 1990 ATC model# 480v/3ph  
(Unit B basement mechanical room)

HVAC Service;

Performance contract with Trane

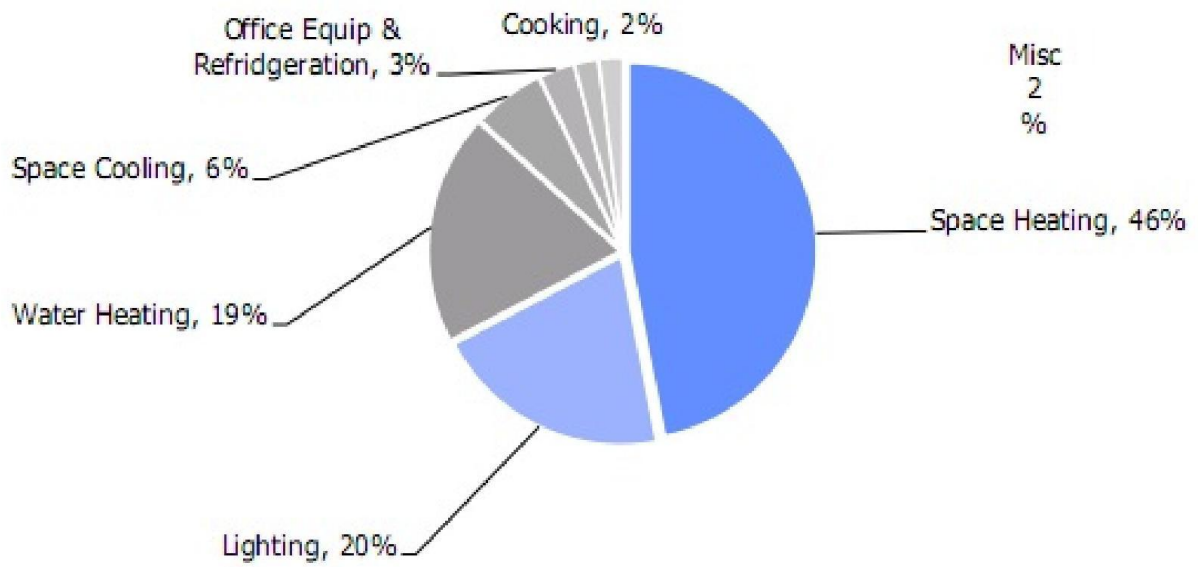
Temperature Controls;

Pneumatic installed 1990

Domestic Hot Water;

120 gallon electric hot water storage 208/3ph  
Hot Water Heater installed 1990  
(Unit B basement mechanical room)

**Building Energy Profile**



**Breakdown of energy use in Schools**  
*Source: US DOE, 2006*

### Building Energy Profile



### LIGHTING

#### Indoor Lighting:

##### First Floor Unit A

Classrooms (297) 2'x4' recessed/4 lamp/34w T12



Hallway (32) 2'x4' recessed/4 lamp/34w T12  
 Lobby (48) 4' recessed/2-lamp/34w T12  
 Offices (10) 2'x4' recessed/4 lamp/34w T12  
 Restrooms (7) 4' recessed/2-lamp/34w T12  
 Stairways (8) 4' recessed/2-lamp/34w T12  
 Storage Rooms (27) 4' recessed/2-lamp/34w T12

##### Second Floor Unit A

Classrooms (333) 2'x4' recessed/4 lamp/34w T12



Hallway (50) 2'x4' recessed/4 lamp/34w T12  
 Faculty Dining Room (9) 2'x4' recessed/4 lamp/34w T12  
 Restrooms (6) 4' recessed/2-lamp/34w T12  
 Stairways (8) 4' recessed/2-lamp/34w T12  
 Storage Rooms (28) 4' recessed/2-lamp/34w T12

### Building Energy Profile

#### First Floor Unit B

Classrooms (56) 2'x4' recessed/4 lamp/34w T12



Hallway (97) 4' recessed/2-lamp/34w T12  
 (26) 2'x4' recessed/4 lamp/34w T12  
 (12) 2'x 2' recessed/2 lamp/20w T12  
 Offices (26) 2'x4' recessed/4 lamp/34w T12  
 Mechanical Rooms (15) 4' recessed/2-lamp/34w T12  
 Restrooms (3) 4' recessed/2-lamp/34w T12  
 Storage Areas (16) 4' recessed/2-lamp/34w T12

#### Second Floor Unit B

Cafeteria (35) 2'x4' recessed/4 lamp/34w T12



Dishwasher Room (8) 4' recessed/2-lamp/34w T12  
 Dry Food Storage (20) 4' recessed/2-lamp/34w T12  
 Freezer-walkin (2) 4' recessed/2-lamp/34w T12  
 Kitchen (45) 4' ceiling mount/2-lamp/34w T12  
 (4) 2'x4' recessed/4 lamp/34w T12



Office (2) 2'x4' recessed/4 lamp/34w T12  
 Refrigerator-walkin (2) 4' recessed/2-lamp/34w T12

### Building Energy Profile

Unit C	Stairway	(4) 4' recessed/2-lamp/34w T12
	Storage	(8) 4' recessed/2-lamp/34w T12
	Auditorium	(35) 250 watt halogen
	Classrooms	(24) 4' pendant/2-lamp/34w T12
		(64) 2'x4' recessed/4 lamp/34w T12
	Conference Room	(12) 2'x4' recessed/4 lamp/34w T12
		(4) 4' recessed/2-lamp/34w T12
	Electric Room	(3) 4' pendant/2-lamp/34w T12
	Hallway	(24) 2'x4' recessed/4 lamp/34w T12
		(11) 4' pendant/2-lamp/34w T12
	Library	(40) 2'x4' recessed/4 lamp/34w T12
		(16) 4' pendant/2-lamp/34w T12
	Library (music)	(4) 2'x4' recessed/4 lamp/34w T12
	Lobby	(20) 2'x4' recessed/4 lamp/34w T12
		(8) 4' recessed/2-lamp/34w T12
Music Room	(10) 4' pendant/2-lamp/34w T12	
Office	(6) 4' recessed/2-lamp/34w T12	
Restrooms	(8) 4' recessed/2-lamp/34w T12	
Stage	(12) 500 watt halogen	
	(14) 4' pendant/2-lamp/34w T12	
	(8) 2'x4' recessed/4 lamp/34w T12	
Storage	(10) 4' pendant/2-lamp/34w T12	
Unit D	Band Room	(20) 2'x4' recessed/4 lamp/34w T12
	Equipment Rooms	(16) 4' pendant/2-lamp/34w T12



Gymnasium (16) metal halide 400w and (30) 150w recessed spot



### Building Energy Profile

Lobby	(30) 2'x4' recessed/4 lamp/34w T12
Locker Rooms	(93) 4' pendant/2-lamp/34w T12
Music Room	(16) 2'x4' recessed/4 lamp/34w T12
Offices	(8) 4' recessed/2-lamp/34w T12
Restrooms	(8) 4' recessed/2-lamp/34w T12
Storage Room	(16) 4' pendant/2-lamp/34w T12
Training Room	(6) 4' recessed/2-lamp/34w T12
Weight Room	(8) 2'x4' recessed/4 lamp/34w T12

#### Lower Level Addition

Classrooms/Storage	(40) 2'x4'/recessed/3-lamp/32w T8
Entry Doors	(14) CFL/down light/1-lamp/42w TT
	(10) 3'/recessed/2-lamp/25w T8
Hallways	(12) 2'x4'/recessed/3-lamp/32w T8
Lobbies/Storage	(46) 4'/strip/2-lamp/32w T8
Locker and Restrooms	(23) 4'/pendant/2-lamp/32w T8
Multipurpose Room	(38) 4'/pendant/2-lamp/T5

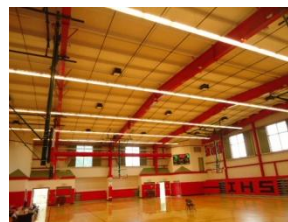
#### Upper Level Addition

Gymnasium/Fitness Center Addition (note: lamps controlled by keyed switch)

Fitness Center (72) 4'/pendant/2-lamp/54w T8



Gymnasium (76) 4'/pendant/2-lamp/54w T8  
(78) 4'/strip/3-lamp/54w T5



Lobby/Office (11) 2'x4'/recessed/3-lamp/32w T8  
Mechanical Deck (8) 4'/pendant/2-lamp/54w T8  
Mezzanine (8) 4'/pendant/1-lamp/54w T8

**Building Energy Profile**

Restrooms	(4) 4'/pendant/2-lamp/32w T8
	(4) 2'/recessed/2-lamp/17w T8
Stairway	(4) 4'/pendant/2-lamp/32w T8
Storage Rooms	(38) 4'/strip/2-lamp/32w T8

**Building Mounted Exterior Lighting:**

Unit C	(8) wall sconce/1 lamp/250w metal halide
Unit D	(13) wall sconce/1 lamp/250w metal halide
Lower Level Addition	(11) metal halide/70w

**Exit Signs: (67)**

First Floor Unit A	(15) Incandescent
Second Floor Unit A	(4) Incandescent
First Floor Unit B	(5) Incandescent
Second Floor Unit B	(4) Incandescent
Unit C	(8) Incandescent
Unit D	(11) Incandescent



Lower Level Addition	(14) LED
Upper Level Addition	(6) LED



## Building Energy Profile

### Electrical Equipment

Main Power Distribution at Switchboard 277/480 3-phase

#### I.T. Equipment

535 - PC units  
(age, mfg, model not identified)

33 – printers  
(age, mfg, model not identified)

Xerox copier models-WC5225, WC5225, 5818, WC5755A, 4595

#### Kitchen

(1) Larkin/walk in freezer/model# LDT0300LGC  
208v/50 amp



(1) Larkin/walk in cooler/model# (not identified in plan documents)



(1) Trenton/refrigeration cooler/model# TEA035LG-HT3A-BR  
208v/23.1 amp

(4) slicers  
(age, mfg., model, and supporting system not identified in plan documents)



## Building Energy Profile

(1) Hobart/dishwasher/model# CL44e  
water heat type electric,126 gallons water usage per hour, conveyor type, single tank design, 202 racks/hour, stainless steel enclosure panels “Energy Star Rated”



(1) Manitowoc/ice machine/model#QDO282A  
120v/12.5 amp

(2) Traulsen/refrigerator/model# RHT2-32NUT  
115v/11.5 amp

(1) Traulsen/refrigerator/model# RHT1-32WUT  
115v/11.3 amp

(1) Traulsen/refrigerator/model# RHT1-32LUT  
115v/8.86 amp

(1) Heusch/dryer/model# 30 EG  
120v/11 amp

(1) UniMac/washer/model#UC20BN2BU60001  
120v/15 amp

(1) Cleveland Range Company/convection steamer/model# 24CEM  
115v/50 watt/.5 amp

(1) Hobart/mixer/model# D-300  
208v/3-h/2.1 amp/1725 rpm

(1) Hobart/mixer/model# HCM-450  
230/460v/3ph/20-10 amp/5hp/1140 rpm

(1) Hobart/mixer/model# M-802



### Building Energy Profile

208v/3ph/7.9 amp/2hp

(10) Market Forge/convection oven/model# M2500HEC

120v/5 amp



(1) Whirlpool/microwave/model# MH1170XSY-0

120v/1800 watt

(1) Menumaster/microwave oven

(mfg./model# not provided)

(1) Insinkerator/disposal/model# SS150-30

208v/230v/460v-3ph, 3.2 amp/4.6 amp/2.3 amp, 1.5hp/1725 rpm

(1) Thermtainer/food warmer/model# 1306-P

120v/2250 watt

(1) Hatco/food warmer/model# GRSDS-36D

120v/15.1 amp/1810 watt

(1) Hatco/food warmer/model# GRBW-48

120v/17 amp/2040 watt



**Building Energy Profile**

(1) Groen/tilt skillet/model# HFP/2/4  
115v/5 amp



(1) Frigidare/dishwasher/model# FD64050KLHS1  
120v/10 amp

Home Economics Classroom

(1) Maytag/built in oven/model# MEW5527DDB16

(1) Whirlpool/electric range/model# RF367LXMQ  
208v/10.6kw

(1) Frigidare/refrigerator/model# FRT21P5A07  
115v/4.5 amp

(1) Whirlpool/refrigerator/model# ED25TEXH00  
115v/6.5 amp

**Miscellaneous Equipment**

Emergency Generator

Kohler model# 60RZ272  
60KW diesel/ purchased 1990



Fire Alarm

Pull station system

Vehicles

Not Identified



## Building Energy Profile

Vending Machines

Gymnasium Lobby



### **Maintenance**

Support staff performs quarterly preventative maintenance scheduled per the academic calendar year. Service agreement with Trane.



## Building Energy Profile

**According to the U.S. Department of Energy, the average school spends 46% of its energy consumption on heating, air conditioning and air handling and 20% on lighting. Following is a short list of the most common Energy Conservation Measures (ECM) that are being implemented by schools:**

**Building Automation Systems:** Since operating hours at a school vary by season, school calendar and outside activities, many schools have installed sophisticated building automation systems. However, independent audits reveal that many of these controls are not functioning correctly, have programmed settings that are out of date, or are maintained by staff or volunteers who need additional training in how to use them. Recommissioning and training for these systems can improve energy efficiency by as much as 15%. Upgrading to newer control technology may be recommended in spaces with variable use. For example, dormitory rooms, meeting rooms, bathrooms and classrooms can now employ wireless programmable thermostats that set back temperatures when rooms are unoccupied for set periods of time. The energy savings versus cost analysis revealed a 2.6-year payback. More complex buildings require building automation systems that can deliver even higher savings, but require more training to properly maintain them.

**Lighting Replacement:** Even buildings that are only two years old can be using outdated lighting technology. The most popular energy conservation measures in lighting include: replacing T-12 fluorescent fixtures with T-8 fixtures/electronic ballasts, replacing Exit sign lamps with LED bulbs, and replacing standard incandescent light bulbs with CFLs (compact fluorescent lamps). New developments in "high-bay" lighting now offer significant savings for applications in warehouses, gymnasiums, auditoriums, etc.

**Light Occupancy Sensors:** Occupancy sensors turn off lights when the space is not in use. Where standard wall switches control room lighting, a low-cost replacement of the switch with a combination switch/occupancy sensor can reduce energy in offices, storage rooms, bathrooms, athletic locker rooms, maintenance facilities, kitchens, coolers and freezers. More sophisticated lighting-control systems can manage multiple buildings and unique applications such as outdoor recreation areas, warehouses, storage and basement areas and even individual classrooms. Lighting controls have also successfully been used where daylight is available in rooms, common areas, and so on to turn down or turn off lighting during mid-day periods when outside light can be used instead. Called "daylighting," installing more windows and overhead skylights partnered with lighting controls allows spaces to use less lighting during the 8:30 a.m. to 4:30 p.m. period.

**Fans and Air-Handling Equipment:** Proper maintenance and routine cleaning can make a big difference in the energy efficiency of fans and other air-handling devices. Additional analysis and possible retro commissioning of equipment such as dampers and fans will ensure that they are being used efficiently and only when needed. Finally, upgrading to variable frequency drives on motors that do not need to be in constant use provides additional significant energy savings.



## Building Energy Profile

**Energy Misers:** Many new devices are available that cut power or lower power to devices such as computers, copiers, flat screen monitors and vending machines. The return on investment for these types of devices is usually between one and two years. Also, another simple idea is to put hot water tanks on timers to set back water temperatures when a building is not in use. Charging extra for hot water washers in dormitories and only running cold water lines to the majority of washers can reduce energy in laundry facilities.

**Water Conservation:** Water and sewer rates are now higher than ever before and are expected to continue to rise. New low-flow faucet aerators and fixtures with sensors can cut back water use dramatically and are showing paybacks in less than six months.

**ENERGY STAR:** Organizations that make a purchasing commitment to ENERGY STAR rated equipment and standards for building equipment have been able to drive more than \$0.40 per square foot off of their baseline energy costs.

A handwritten signature in black ink, appearing to read "Stephen M. Klim", is written over a horizontal line.

Stephen M. Klim  
Energy Efficiency Analyst  
AllFacilities Energy Group

July 29, 2011