Project Payback Summary For:

City of Roswell, GA
East Roswell Park
ViriLight Installation

Prepared By: Roth/Viridian

Proposed Scope of Work: Install eight (12) 4'x8' and two (2) 4'x4' ViriLight units

Existing Light Fixture Count: 90
Input Watts Per Fixture: 253
Area (sq.ft.): 14,256

Assumptions:

Initial Cost of Electricity ($/kWh): $0.081
Current Annual Burning Hours: 3,600
Projected Annual Burning Hours*: 720
Depreciation Method: 7 Year Straight Line
Inflation Factor: 4.00%

Project Investment: Total Budget: $46,291.30

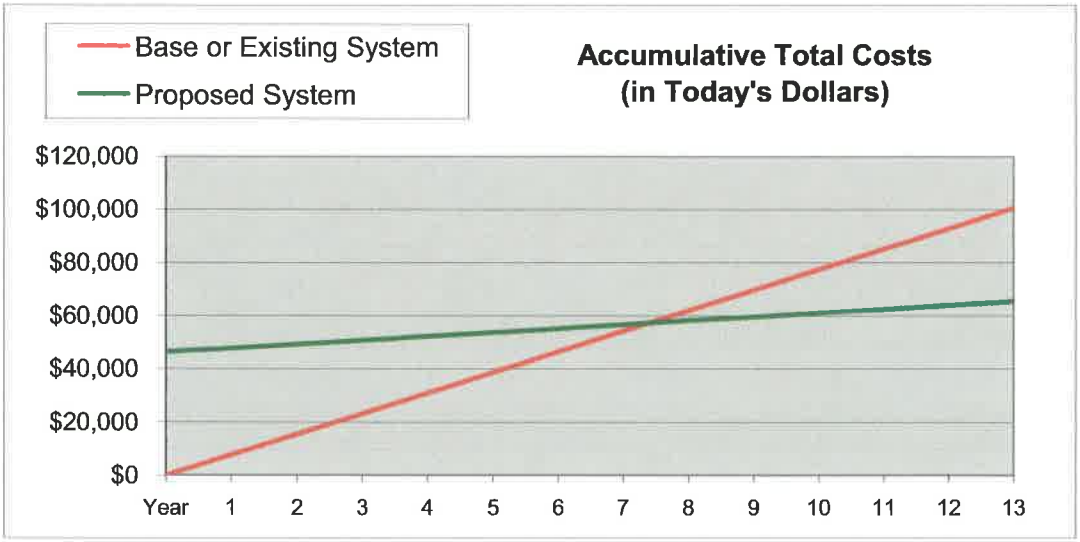
Energy Savings in Affected Area:

	KWh	$	
Current Annual usage:	81,972	$ 7,446.20	*
Expected Annual usage*:	16,394	$ 1,489.24	
% Reduction in Annual usage*:	80.0%	80.0%	
Reduction in Annual usage*:	65,578	$ 5,956.96	

* Current annual usage based on HO lamps resulting in 253 watts per fixture. Actual lamps being used could not be confirmed during site visit.

Economic Analysis: Includes energy savings and reduced operating costs

Simple Payback (years): **7.40**
ROI: **13.5%**



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Executive Summary

Upon completion of our site evaluation and calculations for the Gymnasium Roof we recommend the installation of 12 4'x8' ViriLight units on the main Gym and 2 4'x4' ViriLight units on the lower roof. This will provide you with natural and free light throughout the areas. The basis of design is to install the entire system including ViriLight domes, insulated and fully welded aluminum roof curbs, tie-in to the new roof system following industry and manufacturer recommendations. The finished installation will greatly improve the quality and quantity of light in the gymnasium.

It should be noted that there will be no energy savings unless the lights are turned off at times when the light level is high enough without them. We expect that 85-90% of daylight hours you will be able to turn off your lights and will actually have better light then you currently do. Rather than relying on manually turning on and off the lights you may want to consider installing a sensor to measure light levels in the building. The sensor would be connected to your current lighting system and the lights would automatically turn on or off as required by the current light levels in the building.

Turning off your lights during daylight hours will greatly reduce your electricity usage and be an impressive example of the effects of natural lighting. Below is an example of a 80'x200' storage building with very poor lighting. We installed ViriLight units and increased the amount of light in the building by over 900%. (these pictures were not touched up and were taken on a cloudy day!)

Before

After

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Environmental Impact

Although it appears innocuous, lighting causes air pollution. Here's how: each day, your local power plant will commonly burn coal, oil and gas to generate electricity for your lighting system as well as for your other electrical needs. While burning these fuels produces a readily available and instantaneous supply of electricity, it also generates air pollutants: **carbon dioxide (CO_2) sulfur dioxide (SO_2) and nitrogen oxide (NOx).**

Air Pollution Causes Global Warming, Acid Rain and Smog

Each of these pollutants causes environmental damage. Carbon dioxide (CO_2) causes global warming, sulfur dioxide (SO_2) causes acid rain, and nitrogen oxides (NOx) cause both acid rain and smog.

Your lighting project will decrease air pollution and environmental damage by the following amounts <u>each year</u>:

- 5,385 lbs. of CO_2
- 6.52 lbs. of SO_2
- 3.77 lbs. of NOx

By removing those quantities of pollutants from the air, your lighting project will have the same affect on the environment as:

Planting	.70	Acres of *conifer trees

*Conifer trees absorb CO_2 year round from the atmosphere, thus reducing the pounds of CO_2 being discharged into the atmosphere.

Removing	.40	Cars from the road annually

Saving	240	Gallons of gasoline annually

Operational Cost Reductions – Less Relamping

Over a ten year period, operational lamp replacement savings are straight line estimated to be $300/year in this building. This is based on reducing the number of replacement lamps and reducing the in-house time required to replace lamps as frequently..

Light Level Analysis

Foot-candle:
A foot-candle is a measure of light intensity. A foot-candle is defined as the amount of light received by 1 square foot of a surface that is 1 foot from a point source of light equivalent to one candle of a certain type. The IESNA (Illuminating Engineering Society of North America) recommends a range of 30-50 foot-candles for a retail environment.

Existing light levels are estimated to be in the range of 10 to 14 foot-candles at floor level. This equates to effective 'generated' wattage of approximately 0.161 watts to 0.225 watts. The ViriLights are estimated to produce, on average, between 75 to 100 foot-candles at the floor. This equates to effective 'free' wattage of approximately 1.2073 watts to 1.6097 watts, or a 750% increase in effective wattage at ZERO additional operating cost.

Application	Foot Candles	Application	Foot Candles
Aircraft Hangar	75-100	Machine Shop	
Assembly-Packaging		Rough	50-75
Medium	50-70	Medium	75-100
Fine	75-100	Fine	100-200
Auto Service Garage	60-80	Manufacturing	
Auto Showroom	50-80	Crude	50-75
Body Shop	80-120	Average	75-100
Church	20-25	Multipurpose Room	2-10
Cooler	0-30	Office	60-75
Engineering/Drafting	50-125	Parking Garage	2-10
Food Processing	30-150	Retail	
Workroom	30	Average	50-80
Inspection Area	150	Superstore	80-120
Foundry	40-60	Swimming Pools	
Gymnasium		Recreational	20-50
Recreational	30	Professional	75
Elementary/Club	50	Tennis Courts	
High School	80	Recreational	50
Hockey		Club	75
Recreational	20-50	Tournament	100
Professional	50-100	Warehouse	
Horse Riding Arena	20-50	Active	20-30
Loading Dock	30-50	Inactive	15-20
		Woodworking Shop	60-80

IESNA Recommended Foot Candles Chart

ROI Calculations

The following two pages summarize our assumptions and potential ROI for this investment. Many factors are considered in these ROI calculations including but not limited to the items outlined above. Complete documentation on this analysis can be provided upon request.

Light Enhancing Skylights

VIRILIGHT™
INNOVATIVE SOLAR ROOF LIGHT

Roofing and Building Preservation | Alternative Energy | Remote Energy Management | HVAC

Sustainable Solutions, Built for Life

TURN OFF your lights during *PEAK DEMAND* hours with VIRILIGHT™

- **Energy Savings of up to 75% for lighting**
- **Diffused Cool, Natural Light**
- **Uninterrupted Light Power**
- **Return on Investment Starts Immediately**
- **Reduce Maintenance Costs**
- **100% deductible in first year**
- **Qualifies for EPAct TAX DEDUCTION!**

Increase productivity through natural light!

VIRILIGHT™ captures and distributes cool and diffused light into the building - **LIGHTS ARE OFF!**

Integrated lighting solutions available to automatically dim in accordance with incoming daylight! Master controls **TURN OFF** the lights once minimum light level is achieved.

VIRIDIAN systems

REGISTERED TO ISO 9001 & 14001 QMS & EMS SYSTEMS

300 Southwest Ave.
Tallmadge, OH 44278
Phone: 330-634-0454
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www.viridiansystems.net

Committed to continual improvement in our Quality and Environmental Management Systems.

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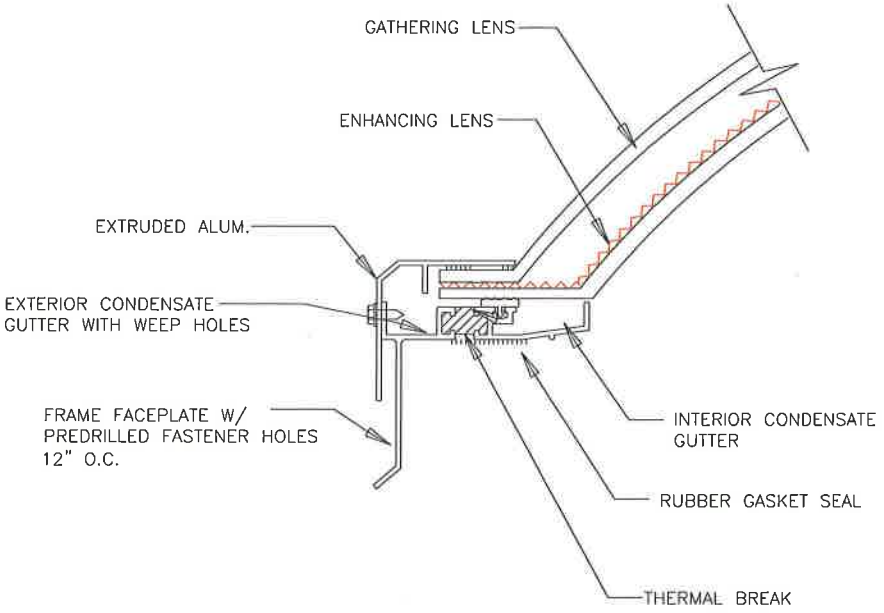
INNOVATIVE SOLAR ROOF LIGHT

Roofing and Building Preservation | Alternative Energy | Remote Energy Management | HVAC

Sustainable Solutions, Built for Life

- Includes thermal breaks and internal gutter system.
- All aluminum construction for better weatherability
- Self-cleaning design
- 100% Made in USA
- Meets Class 1 hail rating (up to 1" hail)

Standard Size	Fits the Outsize Curb Size
4 x 8	49" x 92"
4 x 4	49" square



Optional Add-ons Available:

- Custom-fabricated curbs
  - Fully welded aluminum
  - Insulated
  - White interior finish included
- Fully welded aluminum adapters
- Security grates
- Smoke hatch mechanism

Typical Coverage Rates

COVERAGE RATE for Open Space

Ceiling Height @ 15' - 26'	One unit per 1,000 square ft.
Ceiling Height @ 26' - 30'	One unit per 1,400 square ft.
Ceiling Height @ 30' +	One unit per 1,800 square ft.

COVERAGE RATE for Distribution Center (high rack stack 5'-15' isle ways)

Ceiling Height @ 15' - 40'	Ceiling height x 2 = spacing between ViriLight™ units
Ceiling Height @ 41' +	Contact ViriLight™ sales office

Above listed are TYPICAL for TURNING OFF your lights completely during daytime hours. Note: Actual coverage rates may vary depending on activity and desired light levels. Contact Viridian Systems for design assistance.

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