Florida

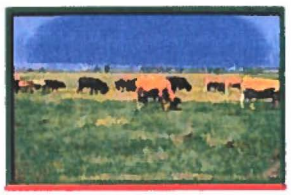
ECAP

Florida Energy Conservation Assistance Program

Helping you Harness, Profit from and Protect the Free Power Provided to all of us by Mother Nature

ASK ABOUT ENERGY STAR

REPORT






BAHAMA SCREENS®

Energy Conserving / Security and Storm Protection

Rebuild America

CERTIFIED INSPECTOR FEO FLORIDA ENERGY OFFICE ALEXANDER E. OTHMER

BUILDINGS

Homeland Security

Saving Energy Saves Everything

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ASK ABOUT ENERGY STAR

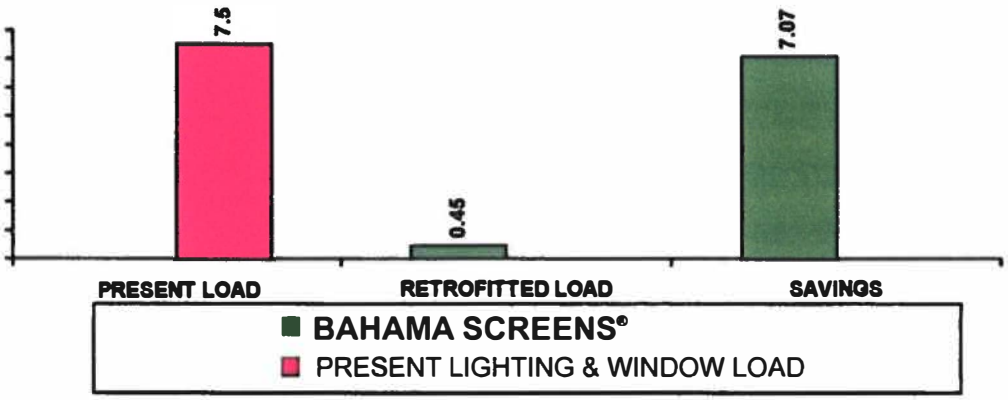
Daylighting Retrofit Analysis

Royal Palms Citi Bank Building

West Palm Beach, Florida

On September 10, 2015 a survey was conducted at the above facility in accordance with the Florida **ENERGY CONSERVATION ASSISTANCE PROGRAMS Designation: ECAP-CUL-1-99 Test Method for Comparing Utility Loads in Standard Constructed Buildings.** The objective of this procedure is to determine the impact of the ***"As Built Conditions and As Installed Components / Equipment"*** on the utility loads in occupied residential, commercial and government buildings. The focus of this procedure is to provide ***a comparison*** to known standards for all parties interested in using Alternative Energy Devices to displaced conventional utility loads.

- Our survey indicated that the existing daytime electric lighting loads could be reduced by 95%* during daylight hours with the installation of a **BAHAMA SCREENS®**. As can be seen in the chart below, under your conditions the **BAHAMA SCREENS®** is a Daylighting Device that obviously would qualify as an Energy device based on renewable resources (solar) in accordance with F.S. 1995 704.07 and section 163.04. ***As installed the* BAHAMA SCREENS® *were having no negative effect on the exterior Architectural Aesthetics of the building and a minimal effect on the original window systems Visual Transmittance (VT).*** The chart below shows a synopsis of our findings.

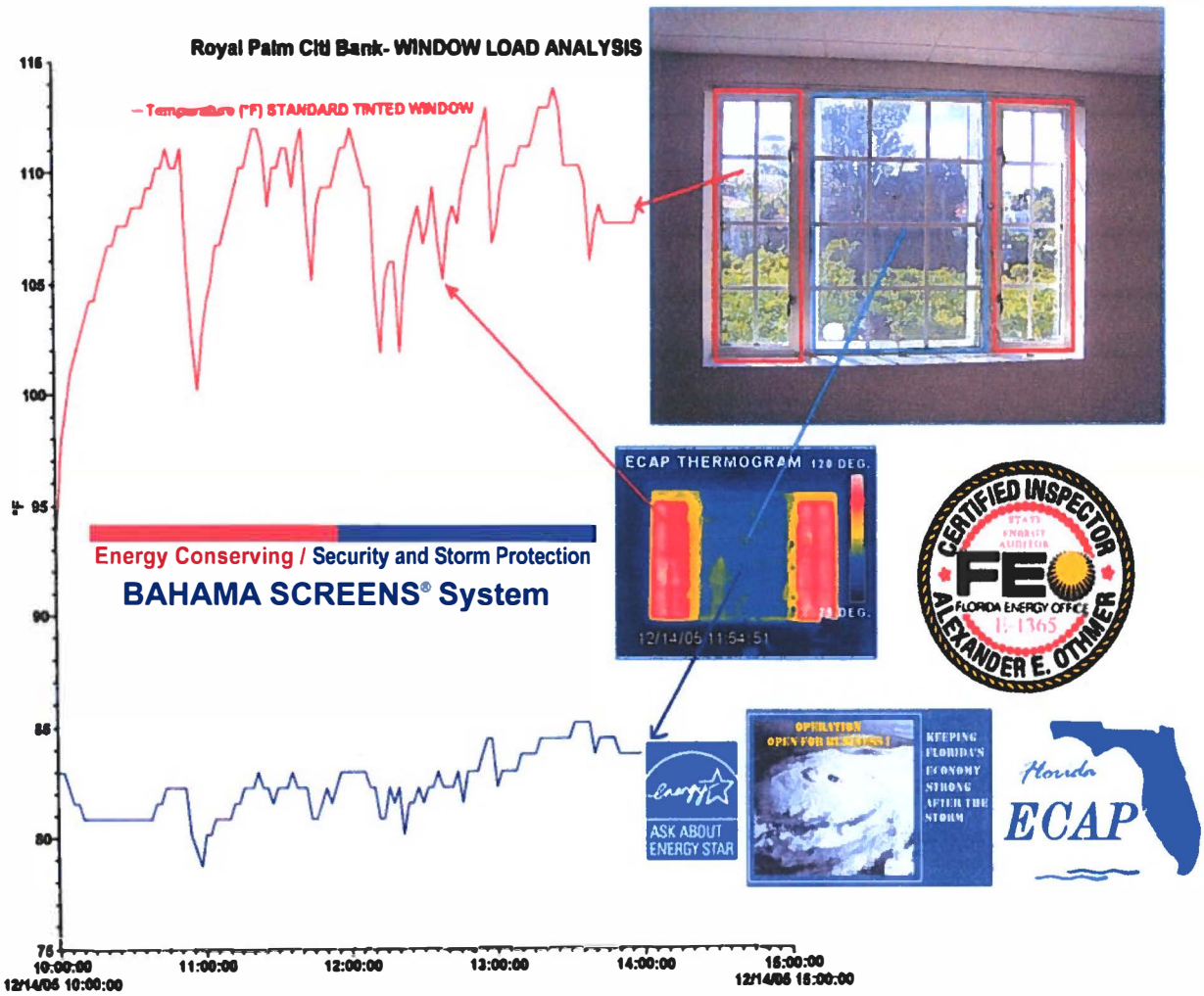


WATTS OF ELECTRICITY BEING CONSUMED / PER LUMEN OF OFFICE LIGHTING PRODUCED / INCLUDING THE AIR CONDITIONING HEAT LOADS BEING GENERATED BY YOUR LIGHTING & WINDOW SYSTEM

* WITHIN A 12 FOOT RADIUS OF THE EXISTING WINDOW OPENINGS DURING EXPOSURE TO DIRECT SUNLIGHT.

SURVEY RESULTS

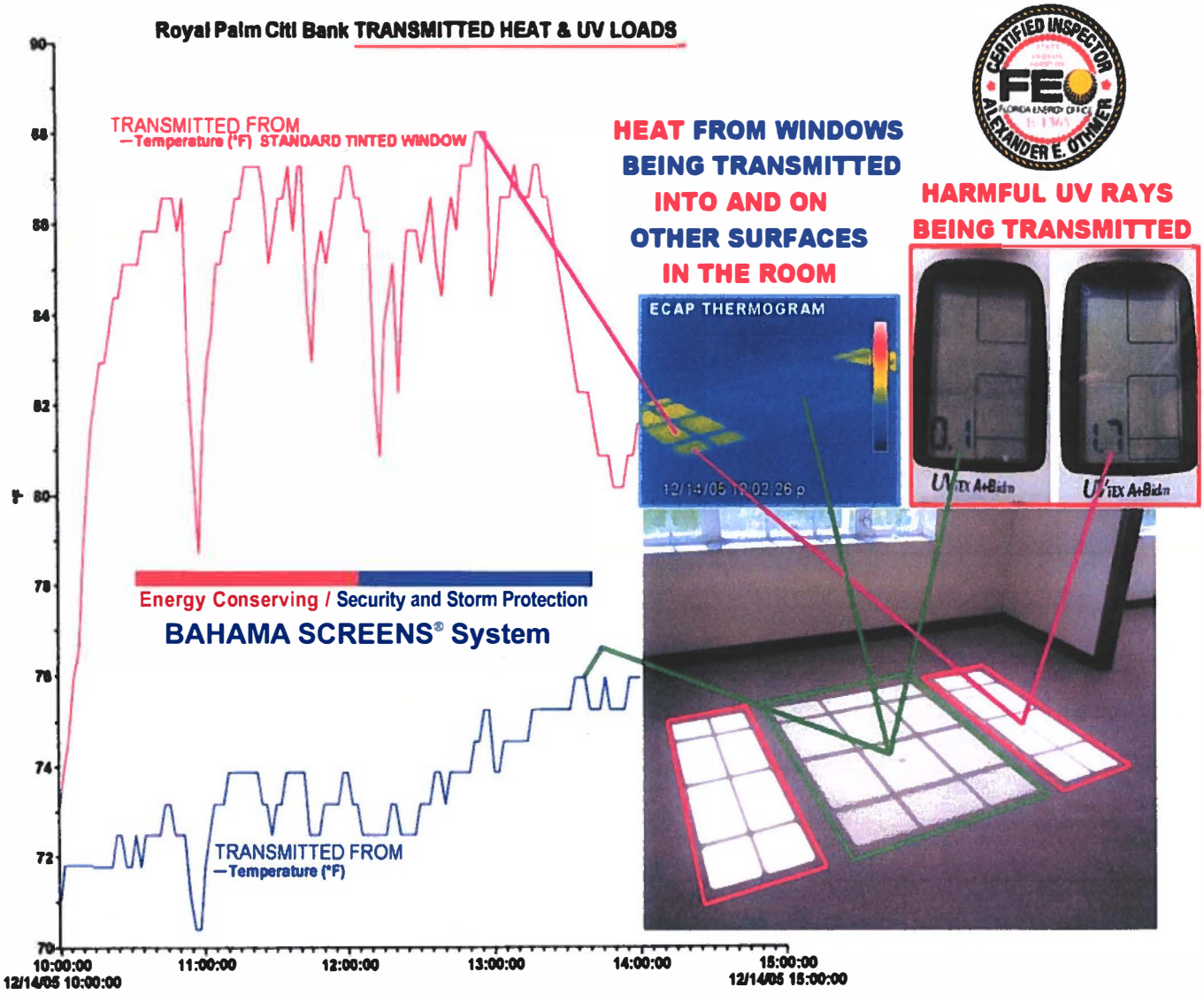
As can be seen in the chart, Thermogram and photos below, the amount of light that was available during daylight hours prior to the retrofit ***was adequate but delivering high thermal loads that normally result in occupant discomfort levels causing continual complaints concerning*** inadequate or defective air conditioning systems.



The center window had been retrofitted with the **BAHAMA SCREENS®**. The ***THERMOGRAM (Infrared heat image)*** clearly shows the reduced heat loads (blue areas) being produced by the **BAHAMA SCREENS®** in comparison to the standard windows on each side of it that have window tint applied to them (red areas).

The contact temperature and heat flux readings in the chart are also showing obvious **conducted thermal load savings**. When the standard *Tinted Window* was hitting inside surface temperatures of *113 Degrees F (105 BTU/Sf/Hr),* the center section of the window protected with the **BAHAMA SCREENS®** had inside surface temperatures as low as ***81 Degrees F (39 BTU/Sf/Hr) producing obvious energy savings while providing, to code, 24-7 STORM PROTECTION.***

The next chart clearly shows that the DISCOMFORT AREA that the ***Tinted Windows were not having any effect on*** went well beyond the *WINDOW OPENING* in the wall;



The ***Thermographic, Harmful UltraViolet Ray (UV) and Surface Temperature Analysis***, once again confirm that the window retrofitted with the **BAHAMA SCREENS®** was significantly out performing the tinted windows as follows;

- Reduced **TRANSMITTED** heat on interior FURNISHING SURFACES BY 25%
- Reduced **TRANSMITTED** Harmful UV RAYS on interior surfaces by 92%

Again the **BAHAMA SCREENS®** produced obvious energy, ***PDM*** (**P**ainting, **D**ecorating and **M**aintenance) ***savings*** while continuing to provide ***to code 24-7 STORM PROTECTION.***

Both the **C**olor **R**endering **I**ndex ***(CRI)*** and the Photopic Ratio (the amount of light perceived by the human eye) from fluorescent fixtures are known contributors to uncomfortable working conditions and reduced human performance.

Health Hazards of Fluorescent Lighting

Known effects and their likely causes

The following is a list of symptoms and diseases known to be linked to exposure to fluorescent lighting

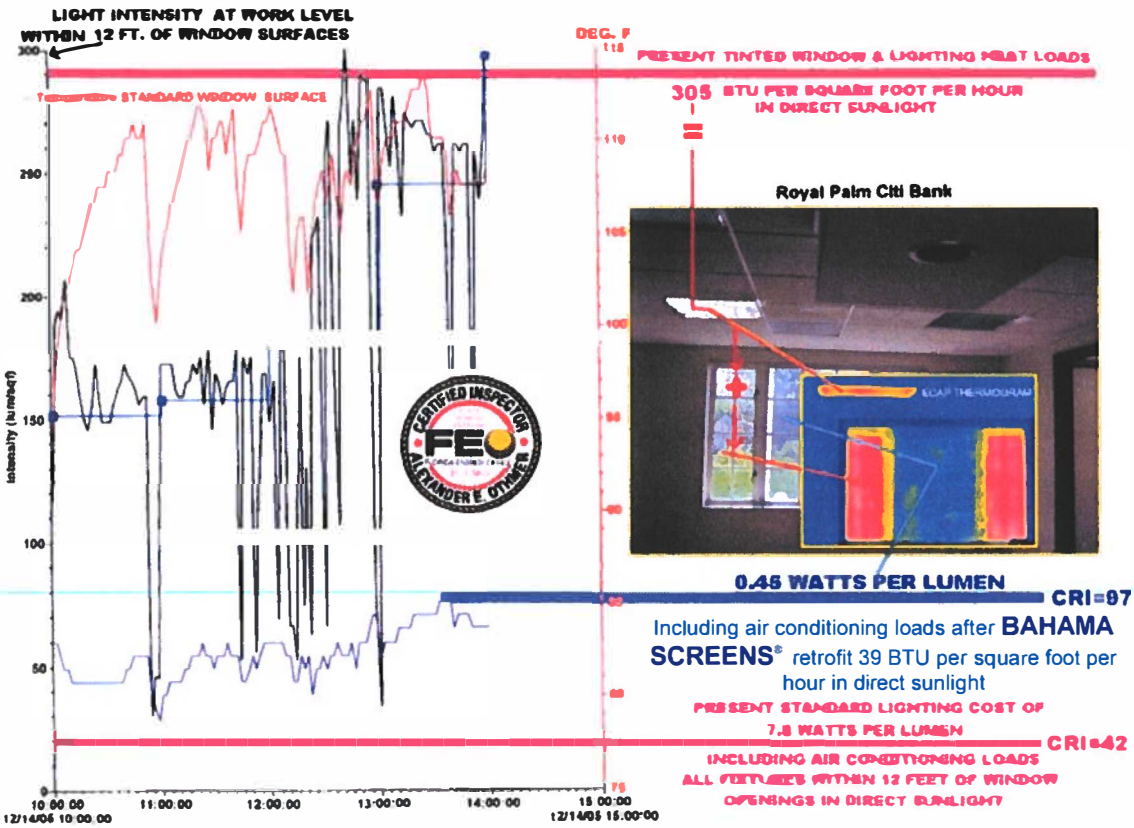
- Headache, eyestrain, eye irritation, fatigue, difficulty in concentration, increased rate of 'misjudgments' and accidents, malaise and irritability can be caused by noise, glare and flicker from fluorescent lighting
- Increased stress (which may in turn lead to heart disease) can arise from increasing the intensity of artificial light with fluorescent tubes. It has been shown that increased use of artificial light (rather than natural light) affects the levels of hormones in the body, particularly the hormones associated with stress, such as corti
- Variation in brightness, as provided by daylight, is necessary for the normal functioning of the body's rhythm The monotonous illumination of fluorescent lighting may also add to the changes in hormone production
- Allergic skin reactions and dermatitis can be caused by exposure to fluorescent lights. An unknown number of people suffer from 'cutaneous light sensitivity' due to fluorescent lights. This means that not only can they become allergic to fluorescent lighting but they can become more sensitive to ordinary sunlight
- Certain long-term, mild skin diseases can become worse if the sufferer is exposed to fluorescent light. Some medical drugs (including some tranquillizers, antibiotics, heart drugs and diuretics) can make you particularly sensitive to UV radiation (photosensitivity). Skin eruptions then occur even with the small doses of UV (in the 300-320nm wavelength range) emitted by white fluorescent lights
- Hyperactivity has been linked to the flickering produced by fluorescent lighting. Microwave emissions from fluorescent lighting are also suspected of contributing to these behavioral disorders. Other mild behavioral disorders in children may be made worse by working at school under fluorescent lighting

Suspected effects

There is also some evidence that the following effects may be caused by exposure to fluorescent lights

- Increased risk of seizure in epilepsy sufferers
- Higher incidence of miscarriage
- Speeding up the aging of the retina

Some of these negative photobiological effect (flicker) and most of the undesirable ultraviolet rays that can cause premature fabric fading and deterioration of furniture protective coatings were significantly reduced with the **BAHAMA SCREENS®** *Daylighting retrofit* that was producing a minimum CRI of *97 and produced no negative photobiological effect flicker.*



Energy Conserving / Security and Storm Protection

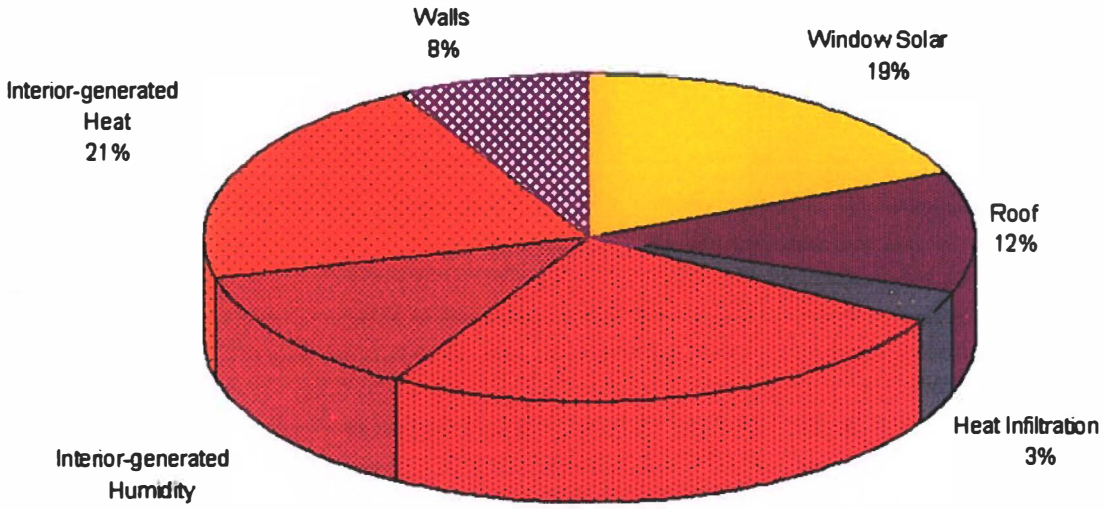
BAHAMA SCREENS® System

"The most abundant New Source of Energy we have in the United States of America is the Energy we can all help to Conserve"

Closing Comments

As can be seen in the charts on pages 2, 3, 4 and 5 of this report, the installation of the **BAHAMA SCREENS®** obviously has the potential of ***saving Energy Dollars***. As seen in the chart below, Solar Gain on window systems in the State of Florida can account for $0.19 out of every dollar spent on air conditioning;

Typical loads and their effect on every dollar spent for cooling in Florida buildings



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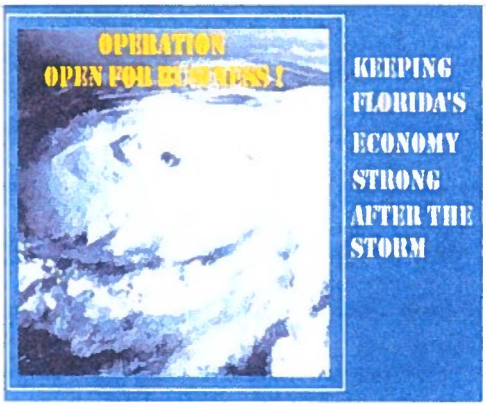
Add to that factor the ***additional loads*** created by ***Interior Generated Heat***, like the additional loads being ***Transmitted*** on to interior surfaces by your present window system (see chart on page 4) and you can see the benefits of taking every opportunity to reducing these loads.

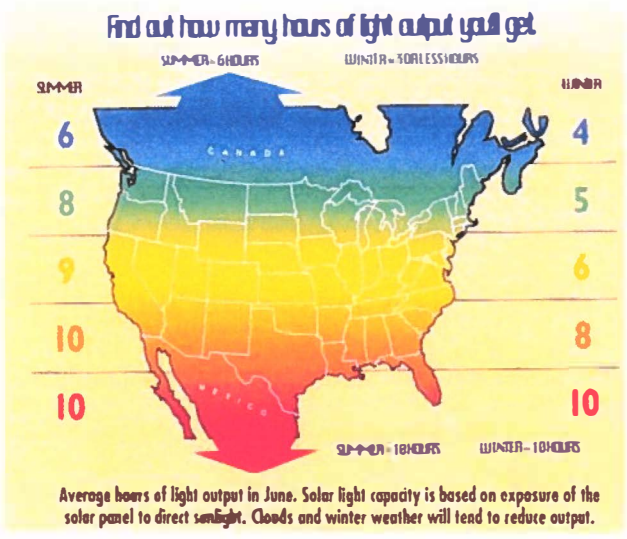


Homeland Security

As always, your ECAP program urges you to protect your business against possible vandalism and storm, damage.

Building owners rarely have the opportunity to incorporate ***security, storm protection and ENERGY CONSERVATION*** into one retrofit. All of our test to date on **BAHAMA SCREENS®** models 300 and 300FX have shown that they allow building owners to accomplish those goals in a cost effective manner.

While the security and storm protection have obvious benefits the actual **R**eturn **O**n **I**nvestment **(ROI)** from a ***strictly ENERGY SAVINGS view point*** has several variables that are predicted on your hours of operation the size and orientation of your window system and seasonal weather patterns. As seen in the next chart, we can expect ***SOLAR GAIN*** to be an ***Energy Consuming Factor in Florida most of the time***.



Our survey indicated that approximately ***2,133 square feet of GLAZING SURFACES*** in your facility are being exposed to direct solar gain on a daily basis.

Rebuild America

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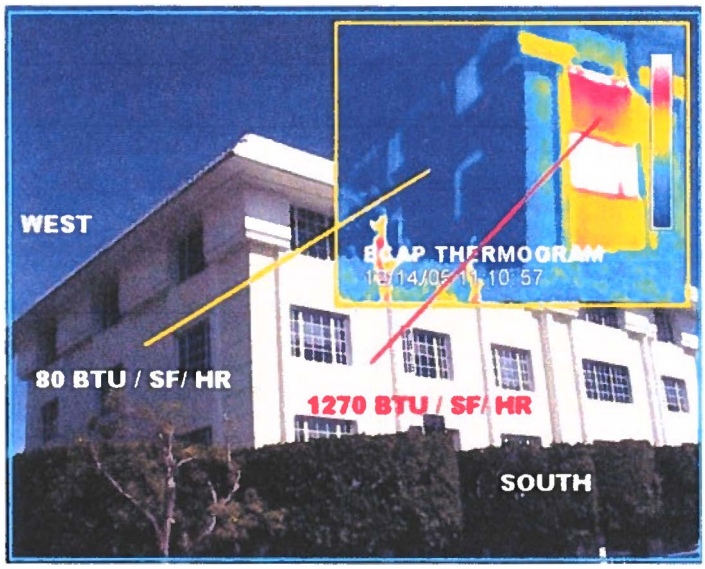
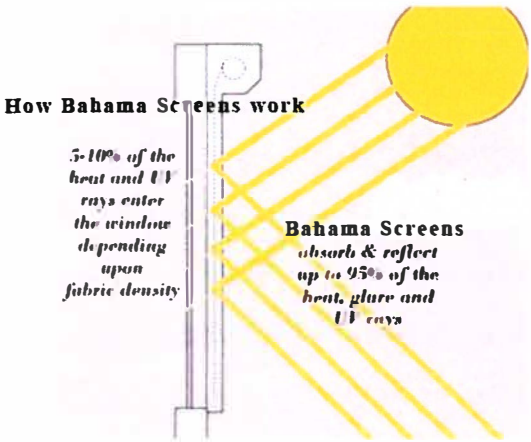
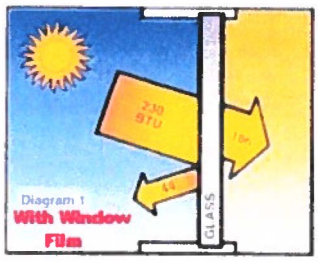
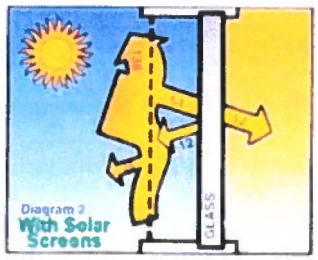
TYPICAL SOLAR GAIN ON THE SOUTH SIDE OF YOUR BUILDING IN SEPTEMBER



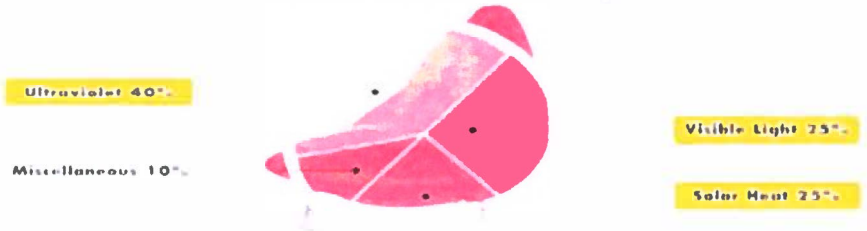
Exterior Bahama Screens block up to 95% of the heat, glare, and ultraviolet rays, without blocking the view. Mounting Exterior Solar Screen Shades on the outside of the window blocks the sun's heat before it enters the glass, instead of trying to reflect unwanted heat back out.

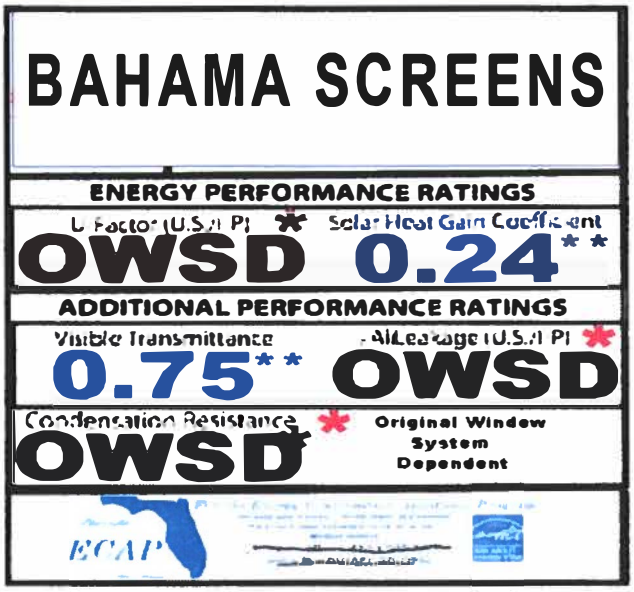






PDM Rule Of Thumb...What Causes Fading





** Performance Equivalent Ratings at the time of analysis using the existing building and window system as a modified climatic chamber and the Sun as the heat source.

Predicated on your present **E**nergy **U**ser **I**ndex (***EUI***) of **95,536 BTU's** a Square Foot Annually. Using historical Florida energy load data for buildings of similar design and use, we would estimate that if all of the windows in your facility were retrofitted to the same efficiency noted above and you incorporated a Passive Daylighting program, the annual savings would result in a **new EUI** of approximately **65,336 BTU's** a Square foot annually, or a **reduction of 30,200 BTU's a Square foot** or 8.85 kWh. Aside from the **possible Dollar Savings,** the annual ***Reduced Environmental Impacts*** , or the pollution created at the power plant to produce the ***electricity delivered to your business*** would equate to approximately;

- ***415,409 Pounds of Reduced Power Plant Emissions*** (greenhouse effect gases).
- ***294,933 Gallons of Water Saved*** used to produce the electricity generated.

On behalf of your ***Florida Energy Conservation Assistance Program***, let me thank you for your efforts to Conserve Energy and reduce it's related Pollution in your community. We hope you will continue to consider ***Florida Manufactured ENERGY STAR & REBUILD AMERICA BUSINESS PARTNERS products*** to assist you in meeting your conservation goals. Please feel free to contact our office if we can be of any assistance in helping you meet your future conservation goals. ***We hope you will share your experiences using the Bahama Screen as a Daylighting alternative with other Business owners.***

CEA/CBA/RDEIII

Alexander E. Othmer
Certified Energy Auditor / Certified Business Analyst / Registered Expert Solar Law Witness
Director, Florida Energy Conservation Assistance Program