

## Presentation Layout

### **Project Background**

Existing Mechanical Summary  
Design Objectives  
Re-design Alternative Systems  
Ground Source Heat Pump  
Solar Panels  
Ventilation Sensors  
System Comparison  
Final Recommendations



## **Freetown Elementary School**



**Matthew Buda**

Faculty Adviser: Dr. Treado  
April 12, 2011

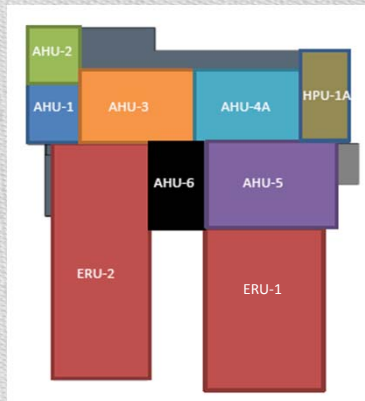
## Project Background

**Size:** 83,000 sq ft  
**Location:** Glen Burnie, MD  
**Construction Dates:** March 2008 – May 2010  
**Delivery Method:** Design Bid Build  
**Cost:** \$17 million

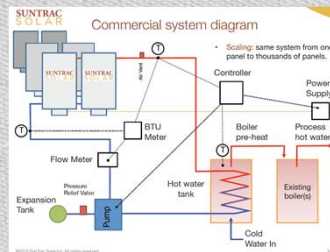
### Project Team

**Owner :** Anne Arundel County Public Schools  
**Architect:** Rubeling & Associates  
**Structural Engineer:** Columbia Engineering  
**MEP Engineer:** James Posey Associates  
**Construction Manager:** Jacobs Engineering Group

### Location of Panels

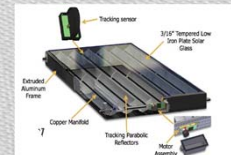


### Solar Panels – Tracking Parabolic Collector



#### SunTrac System

- 5mm tempered glass
- withstand 1 inch hail stones
- copper, glass, aluminum
- easily replaceable motor



### Analysis

Solar Panels			
		75% of full load	50% of full load
Number of SunTrac Panels	#	900	600
Footprint required for system	ft <sup>2</sup>	28800	19200
Price per panel	\$	1950	1950
Rough estimate of BoS & install price per panel	\$/panel	5654	5654
End user's installed price per panel	\$	7604	7604
Total installed system cost:	\$	6,843,600	4,562,400
Yr0 Tax incentive offset			
Yr1 Tax incentive			
Yr1-5 capital write-off			
Yr5 cashflow value			

Description of different slopes for the collector

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### **Solar Panels**

#### **Structural Breadth**

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## **Structural Breadth**

Existing Beams

Existing Columns

## **Layout of Structural Beams**

