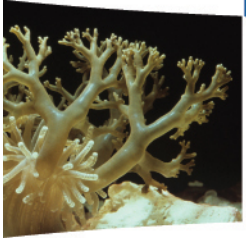




# Shedd Aquarium Battery Storage





## **Stretch Goal:**

**Shedd Reduces its energy consumption by 50% by 2020.**

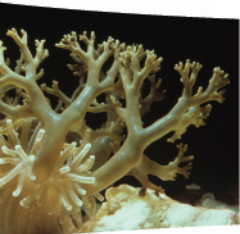
# The Task at Hand



Develop a long-term energy strategic plan in 2012 & Operationalize the Plan in 2013.

- Renewables
- Smart Grid
- Reduction methods

# Master Energy Roadmap



## Current State: “Energy Saver”

A forward thinking institution working to reduce energy *consumption*. A energy saver implements discrete modifications to improve sustainable energy use but **lacks an integrated energy management strategy.**

## Level 1 (2015) “Energy Leader”

A leading institution focusing efforts on **reducing energy consumption**. An energy leader implements industry leading practices for **energy tracking, usage, and sourcing**, while engaging the public in their efforts.

## Level 2 (2020) “Energy Innovator” First Smart Energy Aquarium

A state-of- the –art institution which facilities from around the globe look to for sustainable energy practices. An Energy innovator implements **integrated energy management strategies** and showcases **advanced technologies.**

# Master Energy Roadmap



## Current State: “Energy Saver”

- High Efficiency chillers.
- Free Cooling Heat Exchangers
- Building Automation system.
- LED lighting
- Data collection
- Committed to operational efficiencies

## Level 1 (2015) “Energy Leader”

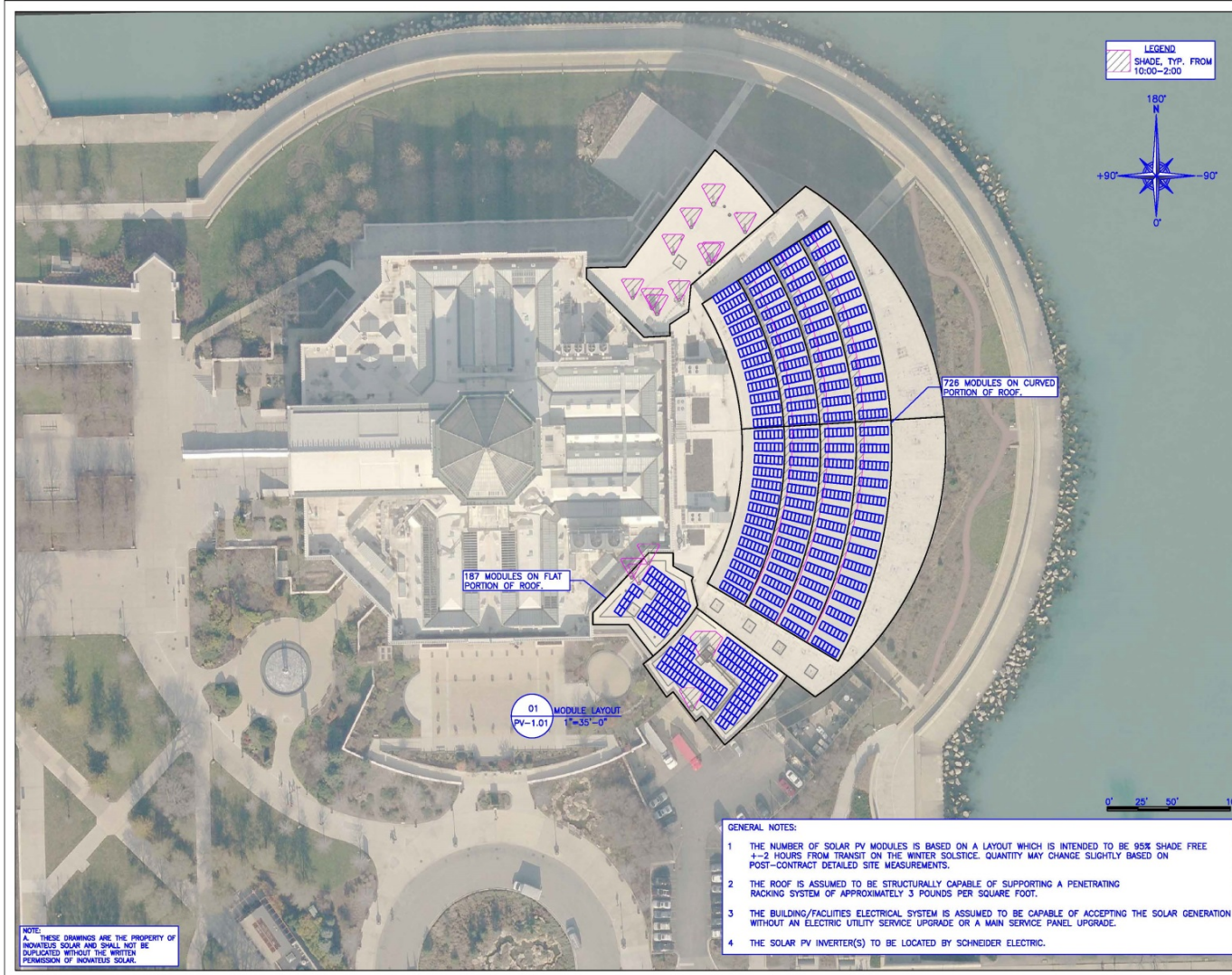
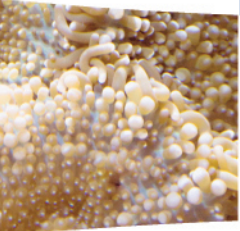
- Install sub meters for real time data collection
- Optimize pump efficiencies with VFD drive
- Power quality ( Power factor)
- Continue LED retro-fits
- On-Site Solar.


## Level 2 (2020) “Energy Innovator” First Smart Energy Aquarium

- Advanced Lighting Control
- Building Analytic Software
- Advanced Daylight Harvesting
- Campus Solar 1.5 MW
- Real Time Energy Pricing
- Advanced Demand response
- Frequency Regulation Markets



# Current Projects Solar Installation





19890 State Line Rd  
South Bend, IN 46637  
877-876-SOLAR

**PROJECT**  
SHEDD AQUARIUM  
#13060534

**CLIENT**  
SCHNEIDER ELECTRIC

**PROJECT ADDRESS**  
1200 S LAKESHORE DR  
CHICAGO, IL 60605

**PROJECT SIZE**  
273.9 kWp  
PHOTOVOLTAIC SYSTEM

**SYSTEM INFORMATION**

MODULES: 300W  
QUANTITY: 913  
STRING SIZE: 11 PANELS 600V SYSTEM  
INVERTERS: SCHNEIDER 250kW  
QUANTITY: 1  
MOUNTING SYSTEM: SCHNEIDER FIXED Z  
MODULE TILT: 12° SOUTH  
ROOF SLOPE: 10° WEST  
SYSTEM AZIMUTH: VARIES

VINCE BARLETTO  
PROFESSIONAL ENGINEER  
CERTIFICATION #: 062.065039  
DESIGNER: J.R. APPROVED BY: A.P.

**REVISIONS**

▲ 6/20/13 PRELIMINARY DESIGN

**LAYOUT PLAN**  
PV-1

*PRELIMINARY DESIGN NOT FOR CONSTRUCTION*

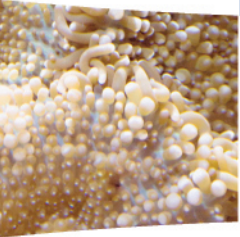
NOTE:  
A. THESE DRAWINGS ARE THE PROPERTY OF INOVATEUS SOLAR AND SHALL NOT BE DUPLICATED WITHOUT THE WRITTEN PERMISSION OF INOVATEUS SOLAR.

- GENERAL NOTES:**
- 1 THE NUMBER OF SOLAR PV MODULES IS BASED ON A LAYOUT WHICH IS INTENDED TO BE 95% SHADE FREE 4-2 HOURS FROM TRANSIT ON THE WINTER SOLSTICE. QUANTITY MAY CHANGE SLIGHTLY BASED ON POST-CONTRACT DETAILED SITE MEASUREMENTS.
  - 2 THE ROOF IS ASSUMED TO BE STRUCTURALLY CAPABLE OF SUPPORTING A PENETRATING RACKING SYSTEM OF APPROXIMATELY 3 POUNDS PER SQUARE FOOT.
  - 3 THE BUILDING/FACILITIES ELECTRICAL SYSTEM IS ASSUMED TO BE CAPABLE OF ACCEPTING THE SOLAR GENERATION WITHOUT AN ELECTRIC UTILITY SERVICE UPGRADE OR A MAIN SERVICE PANEL UPGRADE.
  - 4 THE SOLAR PV INVERTER(S) TO BE LOCATED BY SCHNEIDER ELECTRIC.



# Current Projects

## Solar installation



# Current Projects

## 1-Mega-Watt Battery

