



# Earth Rangers Centre

## Energy Metering and Monitoring

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Manager, Earth Rangers Centre





# Agenda

- Overview of Earth Rangers
- Overview of the ERC
- Why ION?
- How are we using it?
- ERC 2.0
- Visiting the ERC



# Earth Rangers



- Mission: Inspiring children with a lasting passion to build a better future
- 350,000 kids this year!
- Animal Ambassadors
- Earthrangers.com





# Our Home

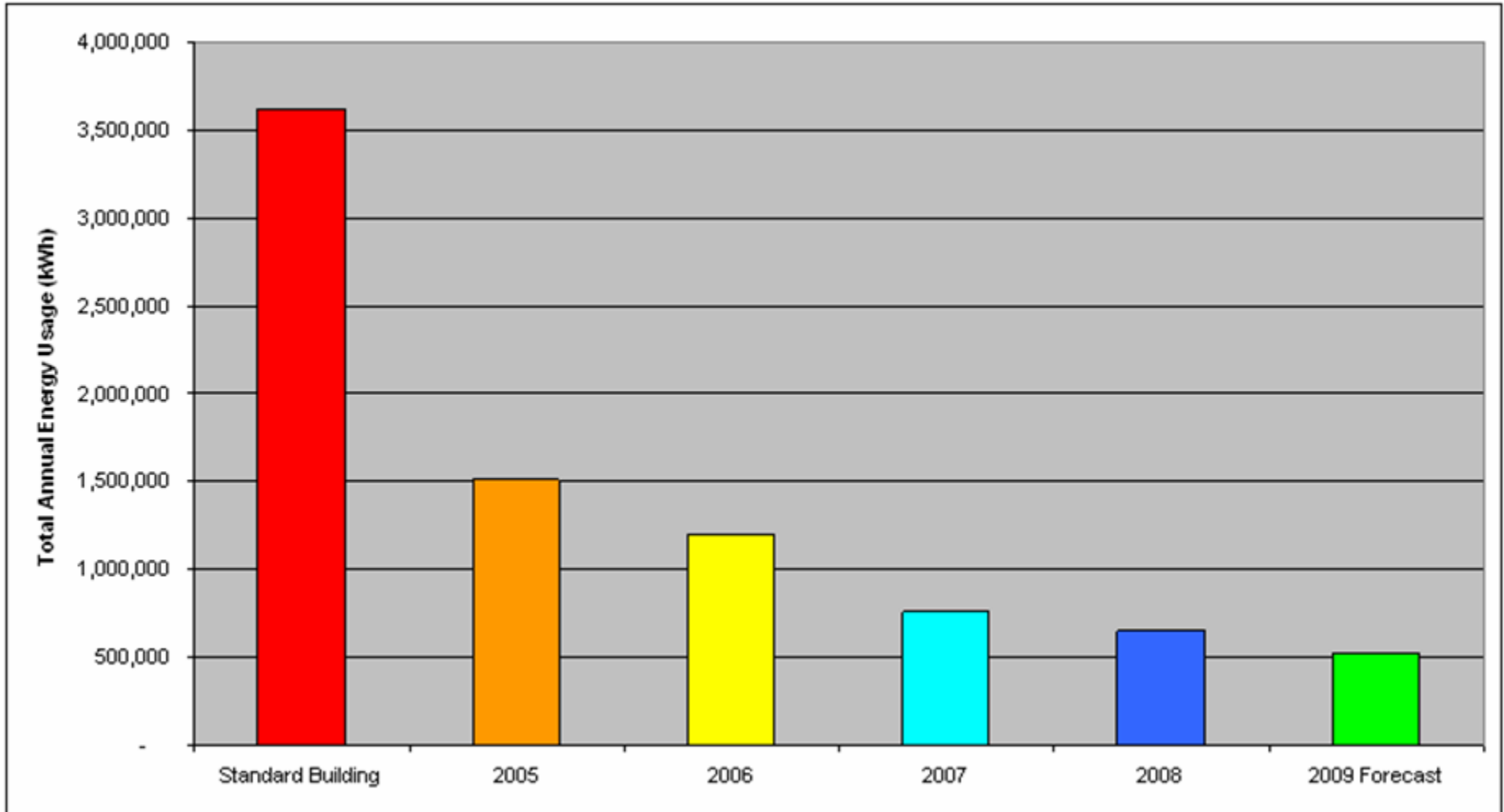


- Built in 2004
- 60,000 sqft
- Designed by Transsolar and Enermodal
- Designed to be 63% more efficient than MNECB
- Achieved LEED-NC Gold in 2006





# ERC Energy Usage





# ERC Technologies

- Radiant slabs for heating and cooling
- Earth tubes
- Green Roof
- Natural day lighting
- Low-VOC interior materials





# ERC Technologies - Water

- Potable water from private well
- Non-potable water recycled by on-site waste water treatment
- Rain water harvested for non-potable use
- Solar thermal domestic hot water heating





# Solar Photovoltaic

- 28kW of PV installed 2008
- 10% of the ERC's daily energy use
- Live tracking on-line at [earthrangers.org](http://earthrangers.org)



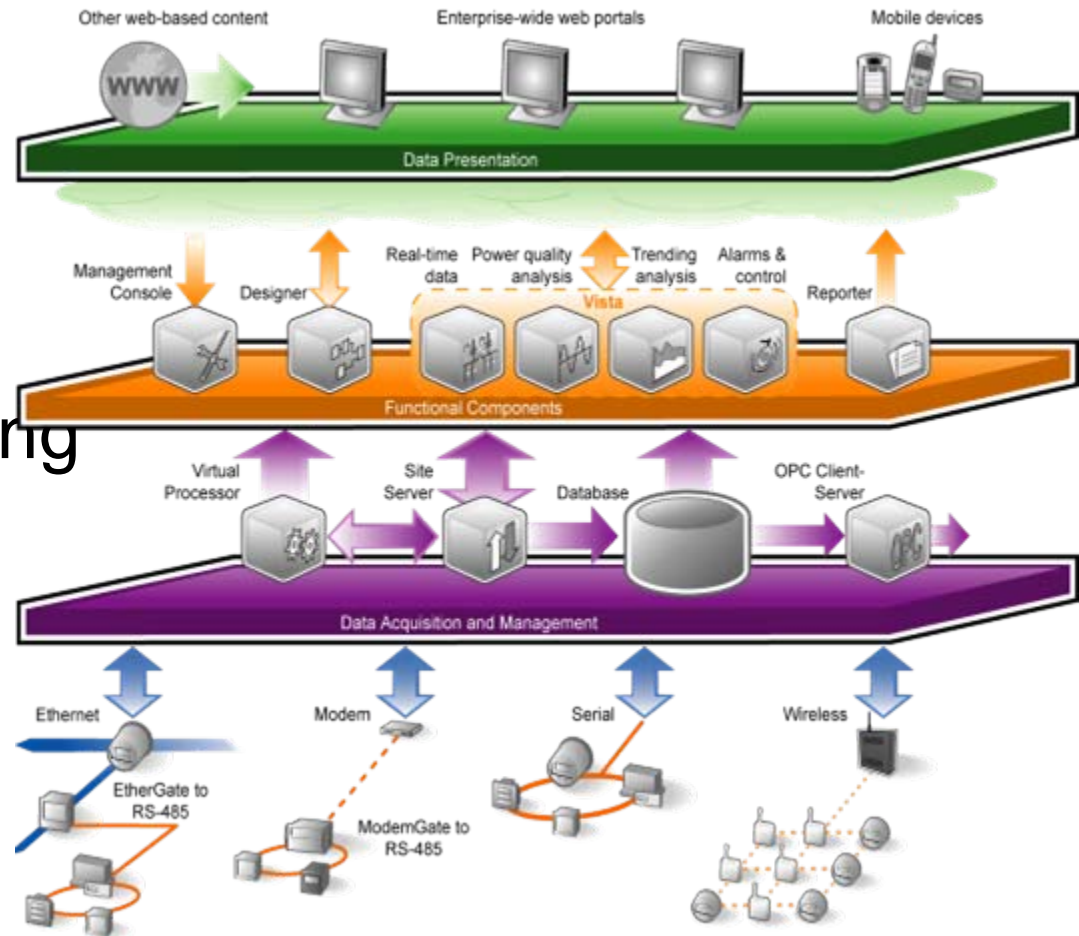
**SANYO**





# Energy Metering and Monitoring

- 65 metering points
  - Electrical energy
  - Thermal energy
  - Water
- All systems including
  - HVAC
  - Lighting
  - Renewables





# Why So Many Points?

- ERC is a complex building
  - Three water systems, including a waste water treatment plant
  - Solar photovoltaic and solar thermal
  - Unique HVAC system
  - Data centre
- Demonstration



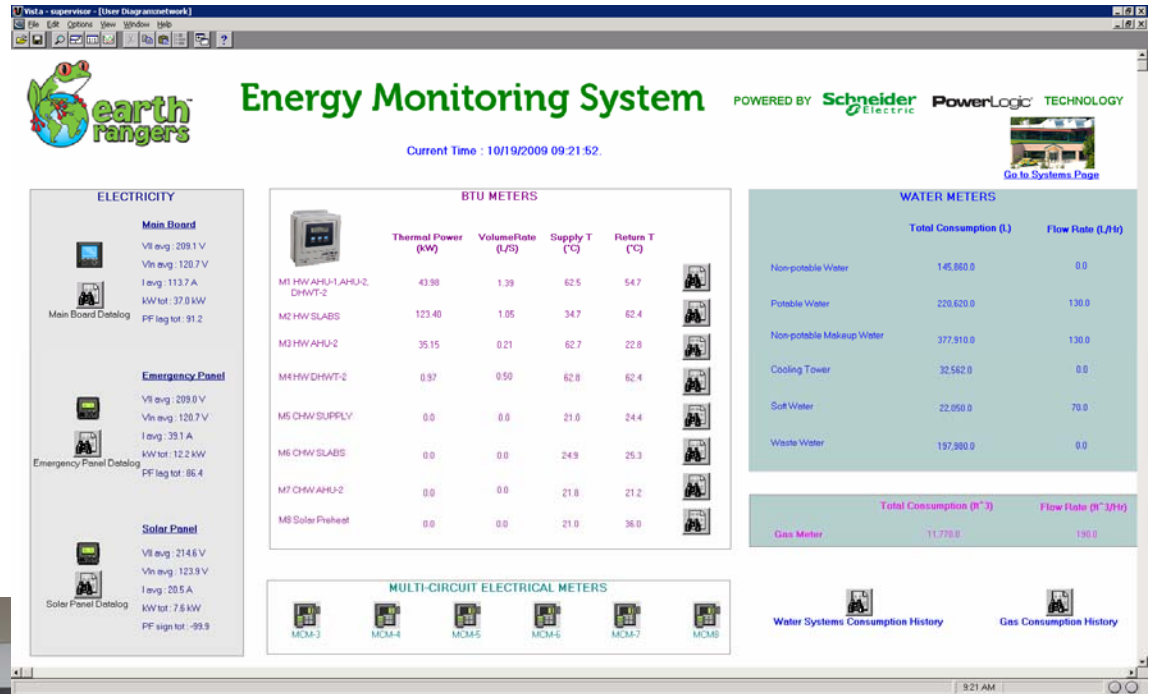
# Why ION?

- Single platform metering
- Interface with third-party meters
- Scalable
- Integration with building automation
- Virtualization of software



# How are we using ION?

- Baseline
- Conservation
- Understanding
- Troubleshooting
- Demonstration





# Baseline



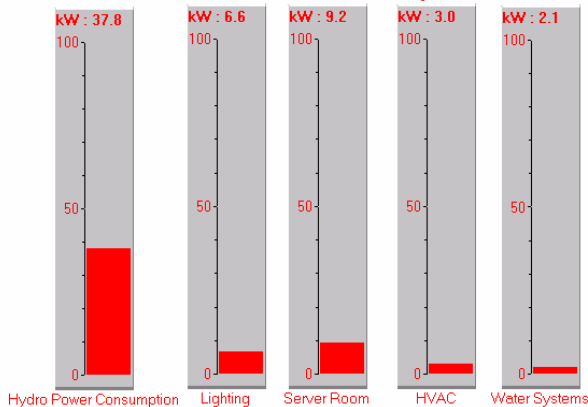
## Energy Monitoring System

POWERED BY **Schneider Electric** PowerLogic<sup>®</sup> TECHNOLOGY

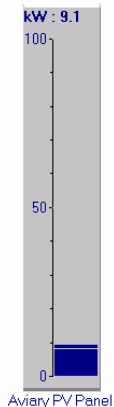


[Go to Overview Page](#)

### Electrical Power Consumption



### Electrical Power Production



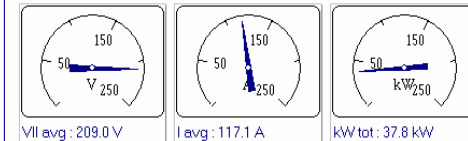
### Sub-system Datalogs

- Lighting History
- Server Room History
- HVAC History
- Water Systems History
- Aviary PV Production History
- Emergency Power

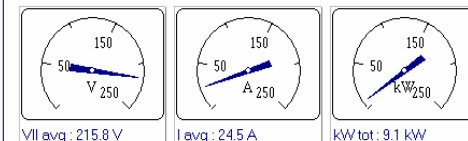
Current Time : 10/19/2009 09:34:47.313 AM

**Total Site Power Consumption : 48.7 kW**

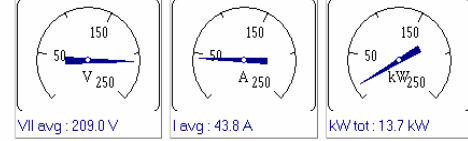
#### Main Switch Board



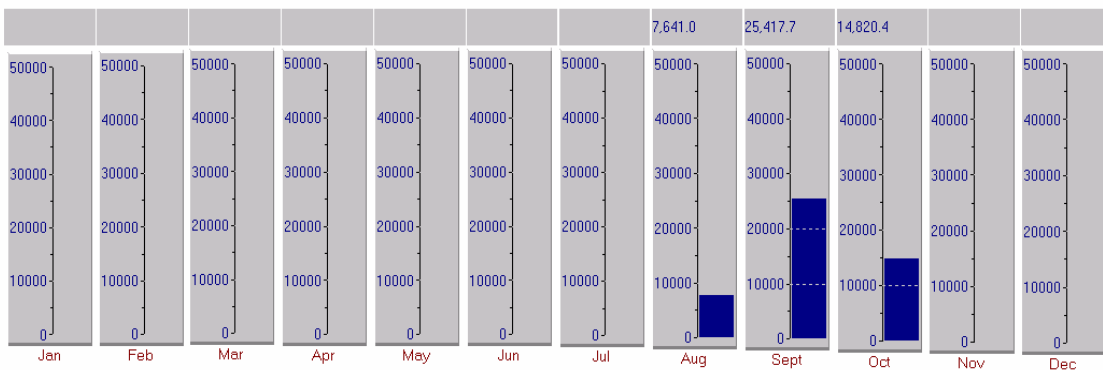
#### Solar Panel



#### Emergency Panel



### Monthly Site Electricity Usage from Utility (kWh)





# Conservation

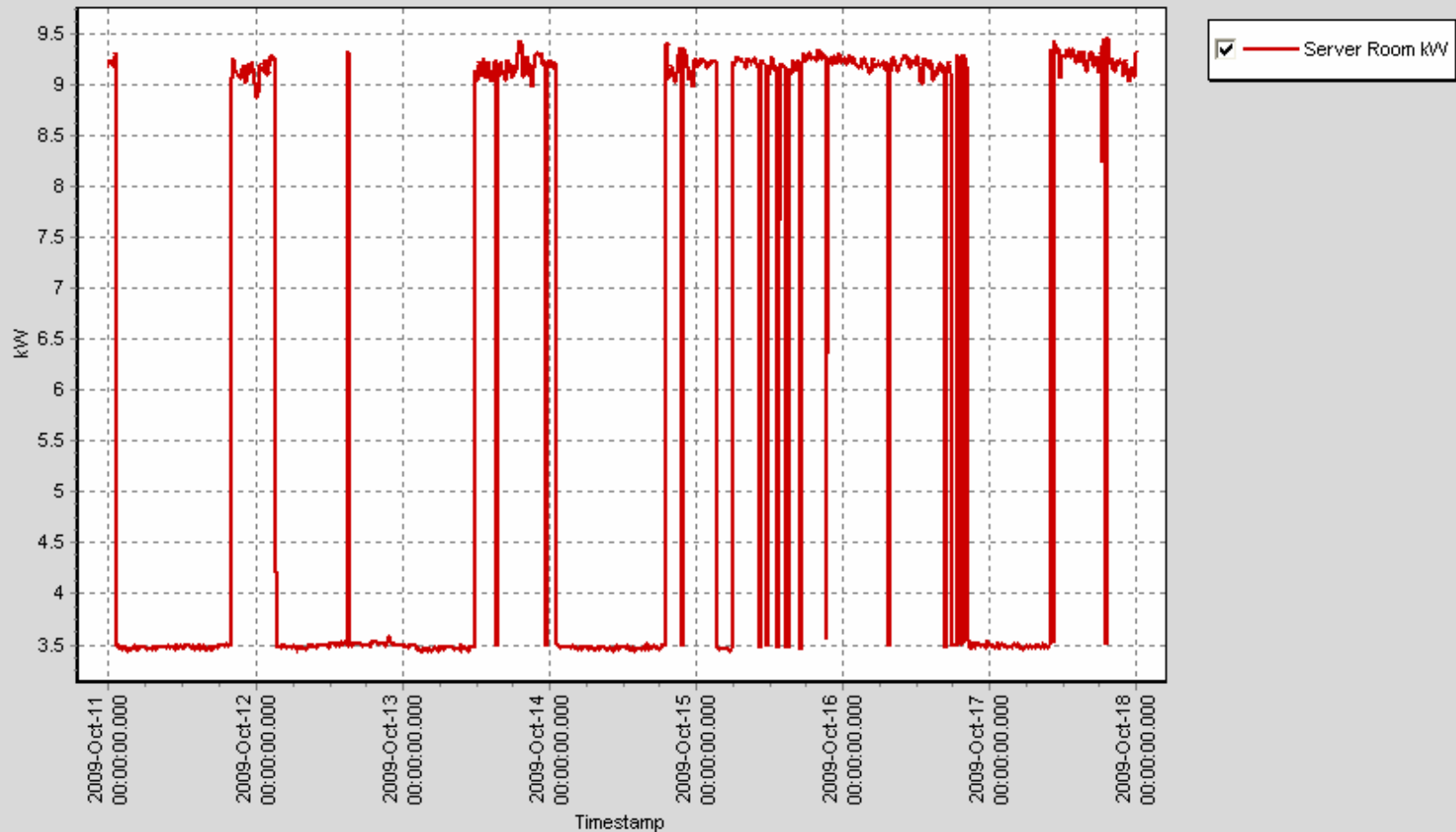
Device Diagram

Change Date Range

Show Table

[Edit Graph](#)

ER Server Room Power Usage





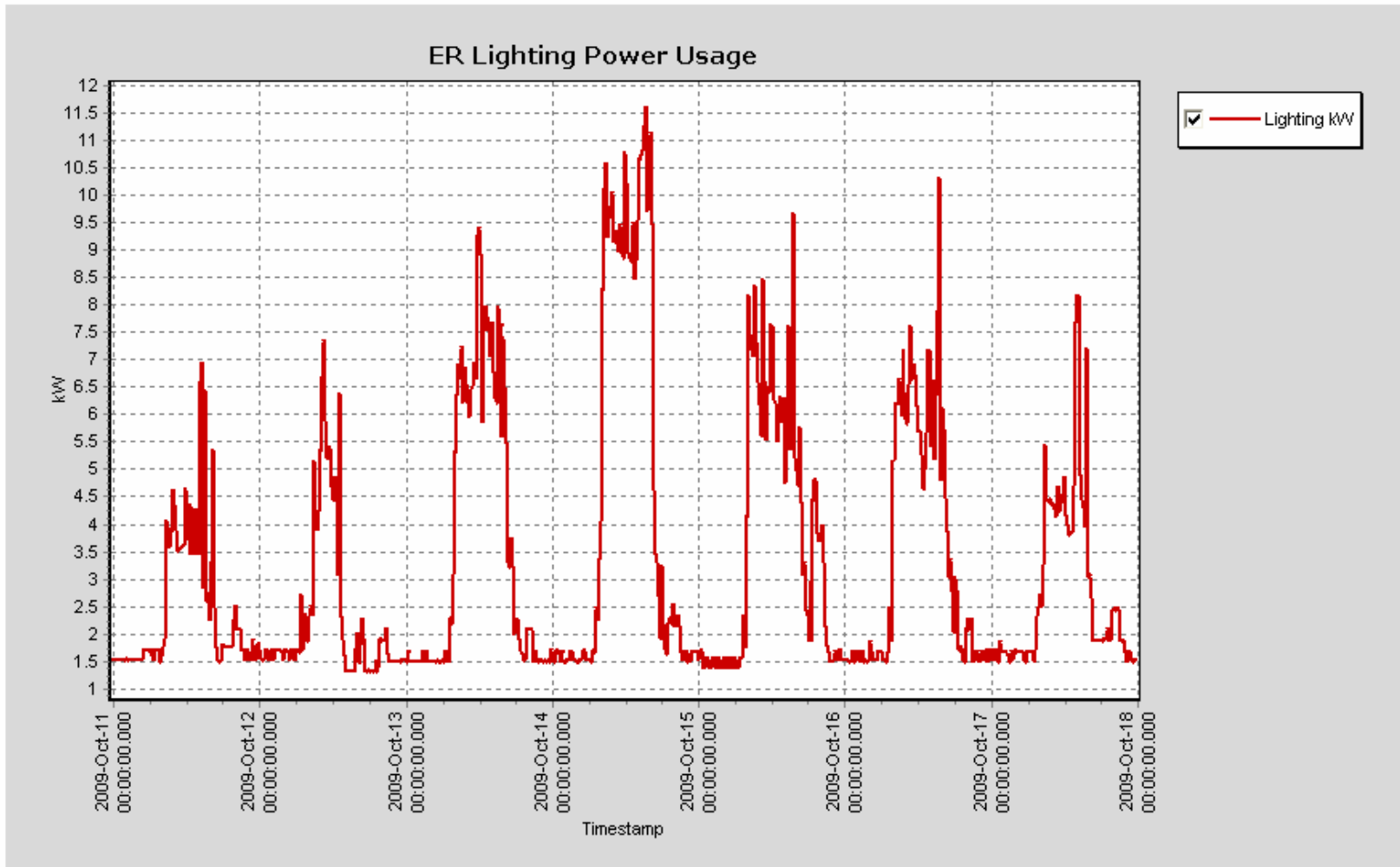
# Understanding

Device Diagram

Change Date Range

Show Table

[Edit Graph](#)



Left-click and drag to zoom. Right-click and drag to pan.



# Demonstration







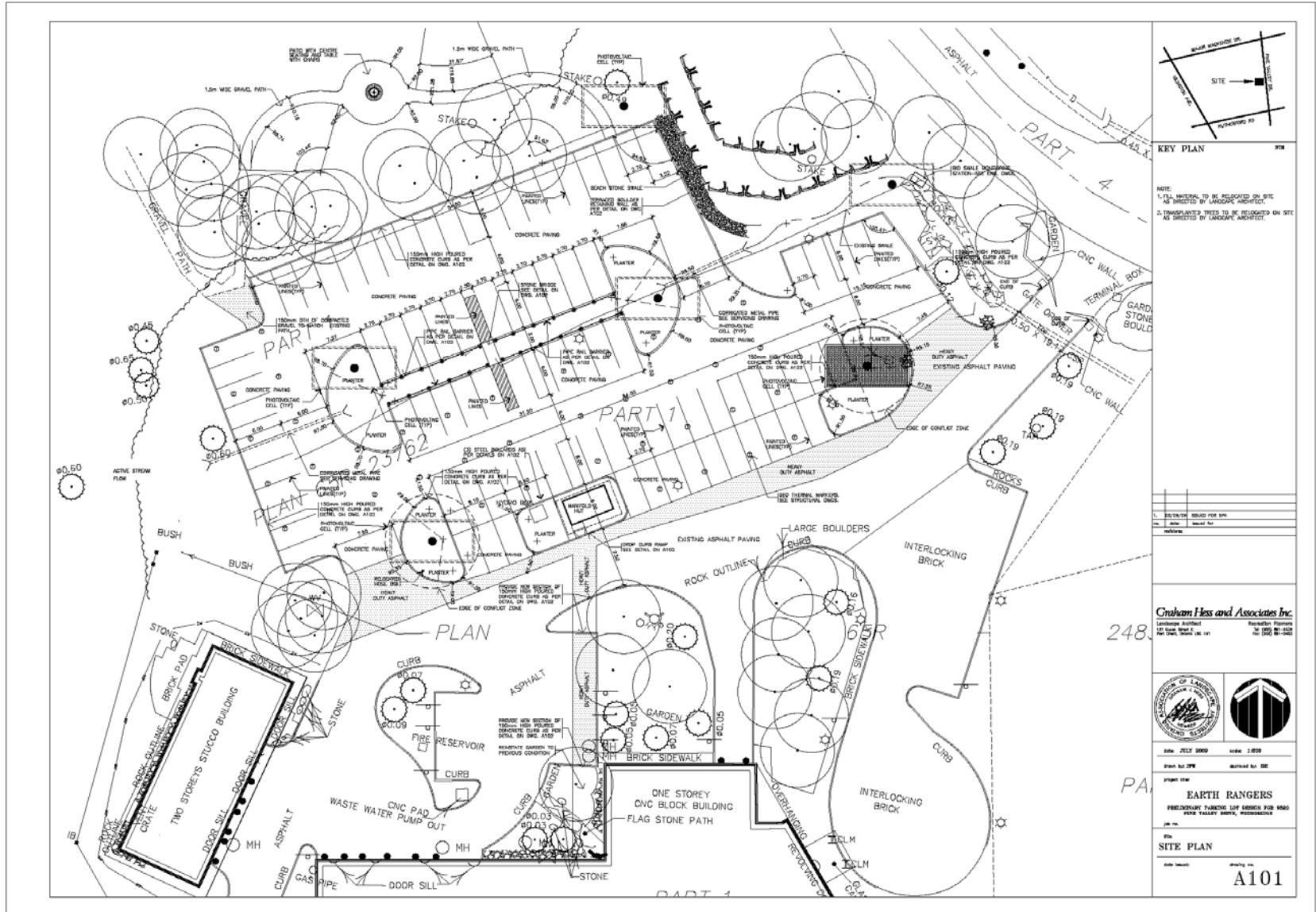
# ERC 2.0

- Energy and carbon neutrality
- Improved infrastructure
- LEED-EBOM Platinum targeted





# Three Projects in One



NOTE:  
 1. ALL MATERIAL TO BE RELOCATED ON SITE AS DIRECTED BY LANDSCAPE ARCHITECT.  
 2. TRANSPLANTED TREES TO BE RELOCATED ON SITE AS DIRECTED BY LANDSCAPE ARCHITECT.

1.	DELIVERED	REVISION FOR DATE
2.	AS BUILT	AS BUILT FOR
3.	REVISION	

**Graham Hess and Associates Inc.**  
 Landscape Architect  
 107 Main Street  
 New York, NY 10014  
 Telephone: (212) 921-1200  
 Fax: (212) 921-1202



DATE: 2/21/2009  
 SCALE: 1:500  
 DRAWN BY: JTB  
 CHECKED BY: DE

PROJECT NAME:  
**EARTH RANGERS**  
 PRESIDENTIAL PARKWAY LOT 1000 FOR BLDG  
 STATE VALLEY DRIVE, WESTCHESTER

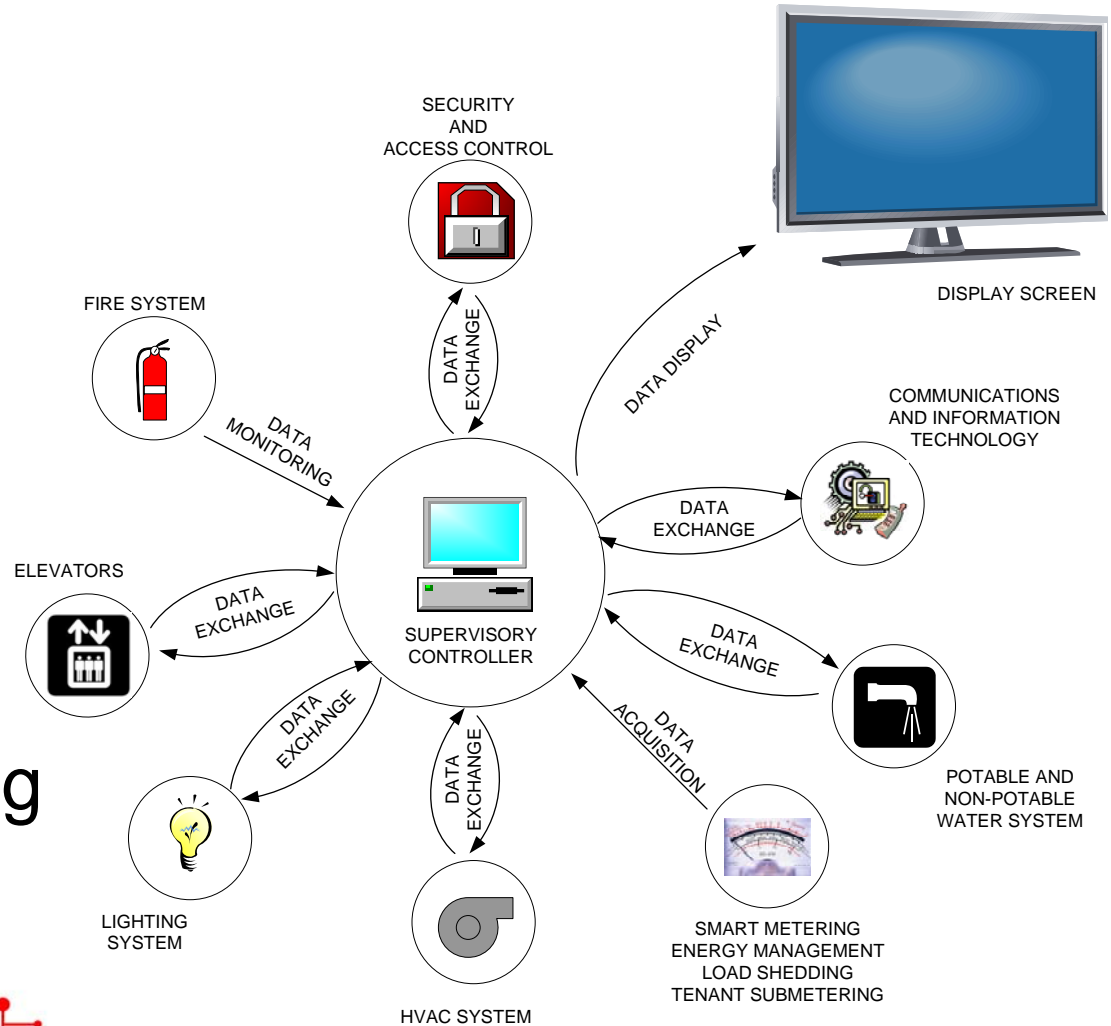
SITE PLAN  
 DATE: 2/21/09  
 DRAWING NO.:

A101



# Interoperable Building Automation

- On demand ventilation
- Finer control of radiant slabs
- Lighting improvements
- Waste energy recovery
- Driven by building intelligence



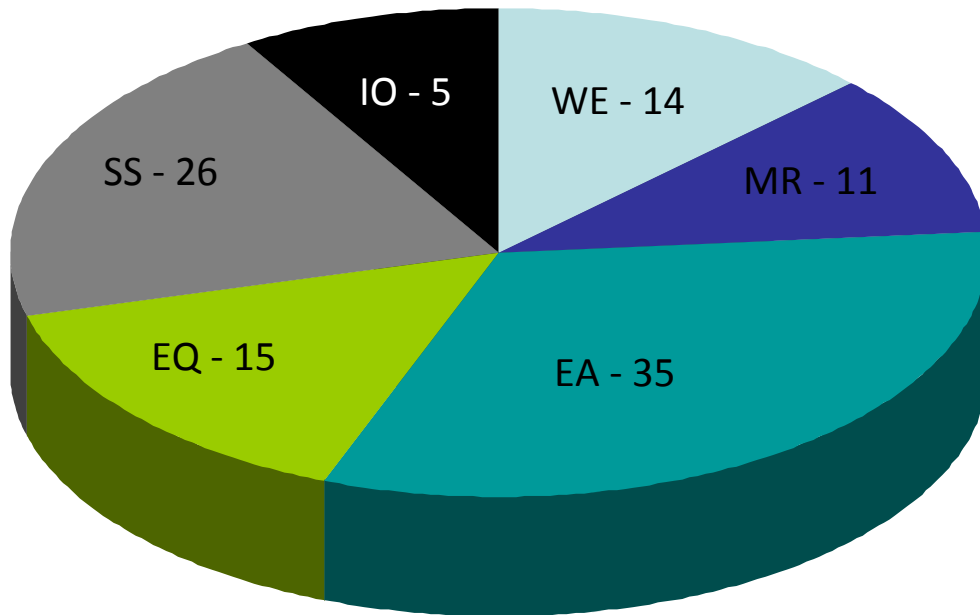


# Existing Buildings: Operations and Maintenance



Targeting LEED EBOM Platinum certification for Earth Rangers  
Spring 2009

LEED EBOM Outline:



Level	Credits
Platinum	80
Gold	60
Silver	50
Certified	40





# Funding

- ERC 2.0 program cost is \$4.5M
  - \$2.5M grant from Industry Canada
  - \$700k in partnership donations
  - \$1.3M from Schad Foundation



Industry  
Canada

Industrie  
Canada



THE SCHAD FOUNDATION





# Technology Demonstrations

- Tours guided by knowledgeable building operations staff
- Eye pleasing installations with informative displays



# Recent Events @ the ERC

Honda Insight Media Launch & Hybrid Owners Event  
Ministry of Natural Resources  
Ontario Power Authority  
Ontario Ministry of Transportation  
World Green Building Council  
Magna  
Tom Leppert, Mayor of Dallas, Texas  
German Ministry of the Environment





# Questions & Contact Info.

Tours and events please contact:  
Sue Kupka at [skupka@earthrangers.com](mailto:skupka@earthrangers.com)

Partnership inquires please contact:  
John Pepelnak at [jpepelnak@earthrangers.com](mailto:jpepelnak@earthrangers.com)

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