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POWERSAVER RANGERS ASSOC.

# OWNER

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## VISION

- Teach Sustainability
  - Through experience
  - Through technology
- Build Sustainably
  - Strive for a Net 0 footprint
  - Become LEED Platinum certified
  - LCA conscience of the materials and energy
- Innovate to set an example
  - Children along with the rest of the community can learn and be inspired by state-of-the-art

# OWNER

## Integrated Design Process

- From the top of the pyramid
  - the owner will express his goals and visions for certain technologies
  - Working from the bottom
    - An overall resource assessment will be taken to understand what kind of leverage can be allowed in the property's environment
    - i.e.) relative national sunlight intensity, shading throughout the year, and climate

# Owner

## Integrated Design Project Management

- Gather a contractors and architects which specialize in sustainable practice
- Organize early Multi-Party contract
  - Swift team involvement early will avoid communication breakdowns later on
- Integrated Project Delivery Agreement (IPDA)
  - A three-way contract between the 'team' and other major sub-contractors provides flexibility and responsibility

# CONTRACTOR

- Hire work force: construction workers and subcontractors (specialized construction)
- Work with budget, and make sure the construction process follows in a timely manner
- Follow the safety codes for workers and the public

## STEPS:

- Demolish concrete and crushing it
- Remediate-Subcontractor

# Contractor

- Courtyard-Phytoextraction during construction where we clean up contaminants
  - Bring plants like sunflowers, indian mustard, willow to extract some of the chemicals from the ground and safely dispose of them
  - Talk with subcontractor and negotiate a time frame in which he wants the project done
- Lay down the foundation
- Frame the space

# Contractor

Choose the materials: solar panels, LightFlex daylighting system, Carpet made from recycled materials like plastic bottles, synthetic gypsum or fly ash drywall, aluminum, porous pavement, recycled paint, and glass tiles

- Electric stair case: Hire a Peizoelectric subcontractor company EDO Corp who specializes in the technology [http://findarticles.com/p/articles/mi\\_m0EIN/is\\_1999\\_July\\_29/ai\\_55293140/will](http://findarticles.com/p/articles/mi_m0EIN/is_1999_July_29/ai_55293140/will)
- Build our self energy generating stairs represented in

# Contractor

<http://ubyssey.ca/news/new-sub-looks-into-pricey-energy-generating-stairway666/>

- Where they estimate the cost to be around 30,000. The return will be from
- The electricity being directed to the property's electric grid but since it
- Is a low output technology the main return will be in human capital from
- Educating the public, specifically you students.
- Drywall and seams go up



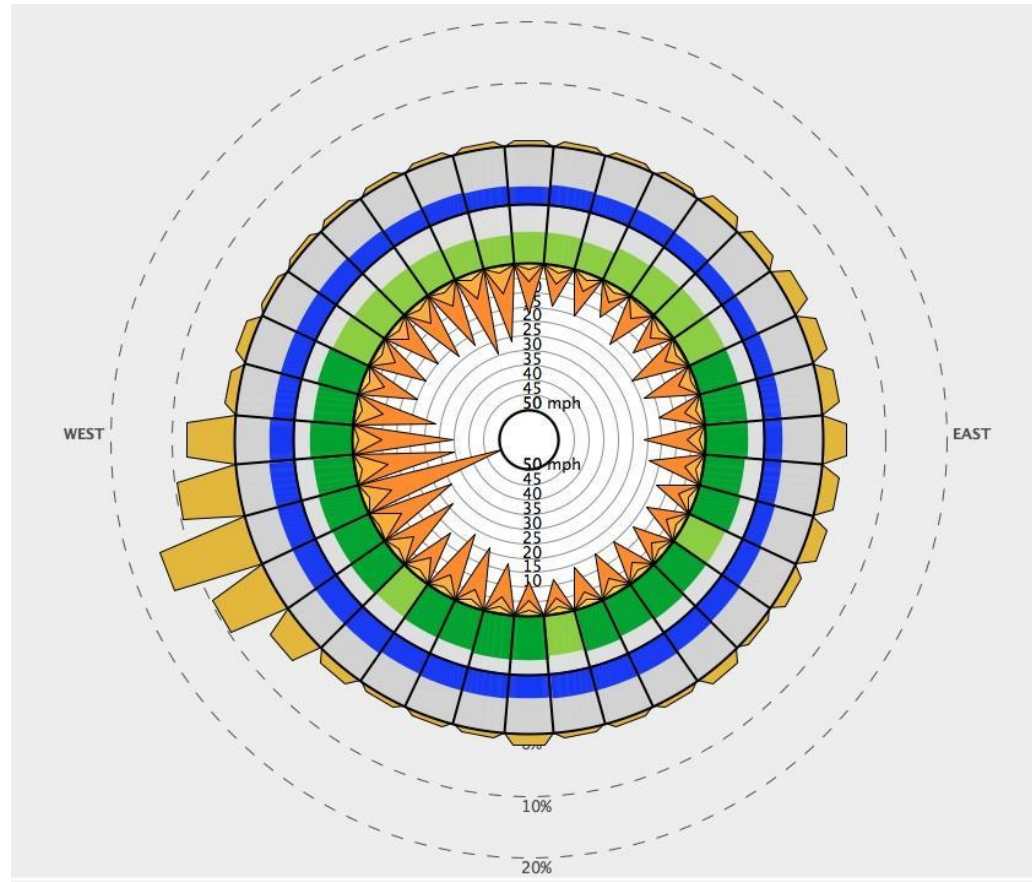
# ARCHITECT

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- The Client
  - Trash4Teaching
  - Inspires Children, Repurposing Manufactured items, innovation
- Integrated Design
  - Process Pyramid
    - Resource Assessment
      - Existing Buildings
    - Site and Building Interaction
      - Sun Paths and Wind Direction
      - Site Plan
    - Building Loads and Elements

# ARCHITECT

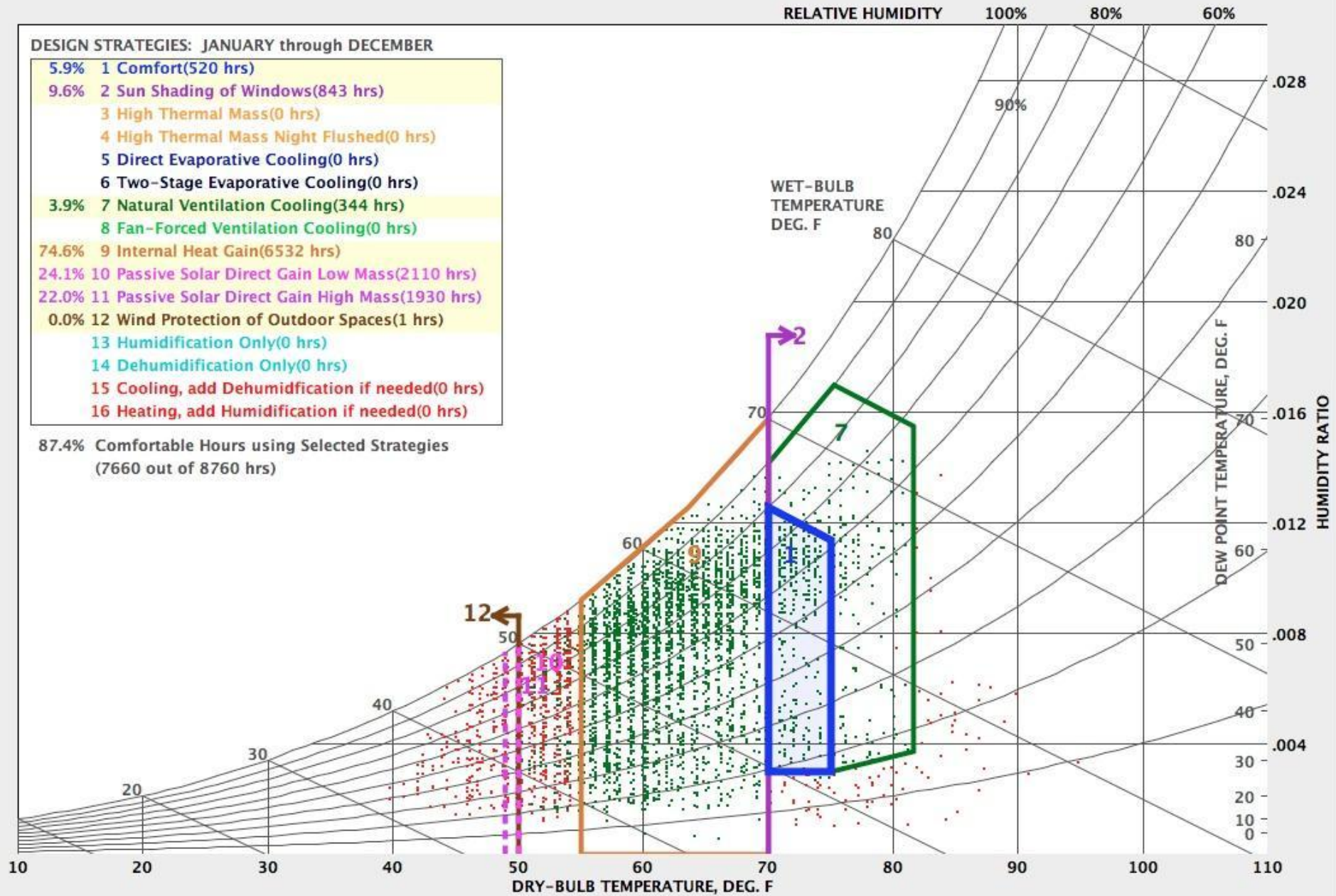
- Analysis - Climate Consultant
  - Wind Rose



DESIGN STRATEGIES: JANUARY through DECEMBER

- 5.9% 1 Comfort(520 hrs)
- 9.6% 2 Sun Shading of Windows(843 hrs)
- 3 High Thermal Mass(0 hrs)
- 4 High Thermal Mass Night Flushed(0 hrs)
- 5 Direct Evaporative Cooling(0 hrs)
- 6 Two-Stage Evaporative Cooling(0 hrs)
- 3.9% 7 Natural Ventilation Cooling(344 hrs)
- 8 Fan-Forced Ventilation Cooling(0 hrs)
- 74.6% 9 Internal Heat Gain(6532 hrs)
- 24.1% 10 Passive Solar Direct Gain Low Mass(2110 hrs)
- 22.0% 11 Passive Solar Direct Gain High Mass(1930 hrs)
- 0.0% 12 Wind Protection of Outdoor Spaces(1 hrs)
- 13 Humidification Only(0 hrs)
- 14 Dehumidification Only(0 hrs)
- 15 Cooling, add Dehumidification if needed(0 hrs)
- 16 Heating, add Humidification if needed(0 hrs)

87.4% Comfortable Hours using Selected Strategies  
(7660 out of 8760 hrs)



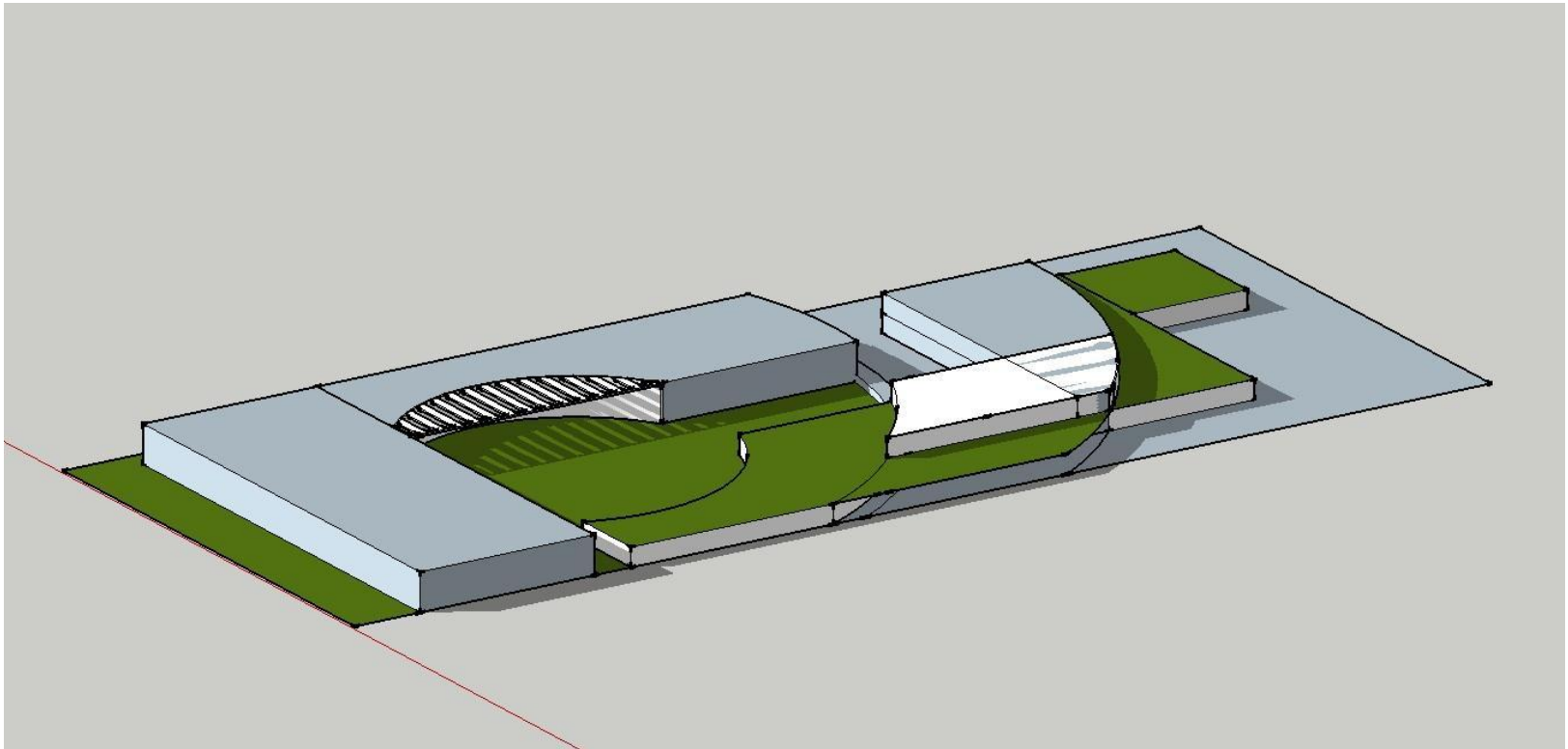
# ARCHITECT

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- Lighting
- Central Courtyard
- Separation of Program
- Integration
- Foster experimentation, creative problem solving, and inspiration

# ARCHITECT

- Floor Plans, Sections, Axonometric



# LANDSCAPE ARCHITECT/CIVIL ENGINEER

- **GREEN ROOF-** Reduces heat island effect while promoting natural habitat.
- **PERVIOUS PAVING-** Reduces water run-off and pollutants.
- **UNDERGROUND STORAGE TANK-** Collects rainwater and graywater eliminating discharge into storm sewer system.
- **ROOFTOP GARDEN-** To communicate basic gardening and serve as a green roof.

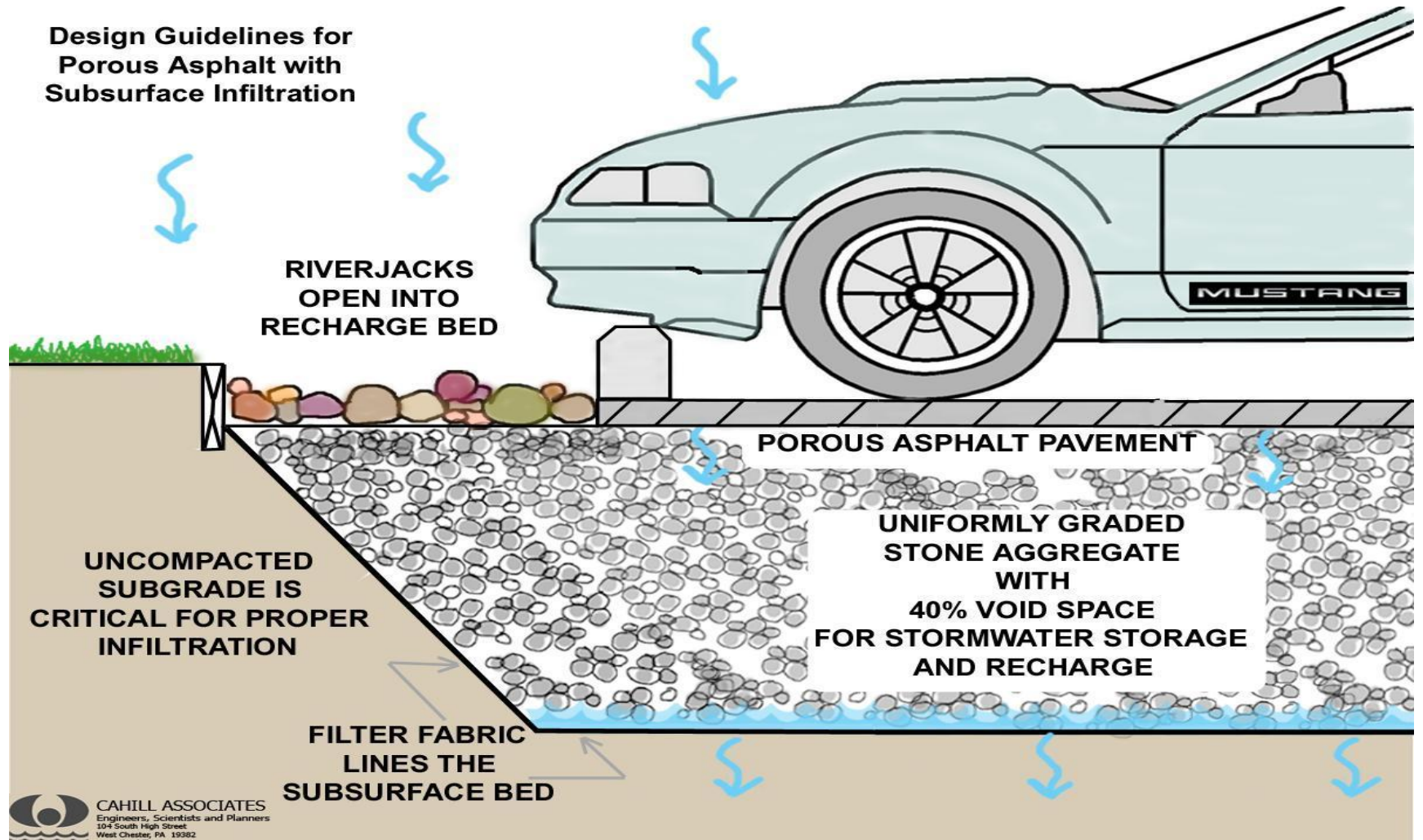


# LANDSCAPE ARCHITECT/CIVIL ENGINEER



# LANDSCAPE ARCHITECT/CIVIL ENGINEER

## Design Guidelines for Porous Asphalt with Subsurface Infiltration





# LANDSCAPE ARCHITECT/CIVIL ENGINEER

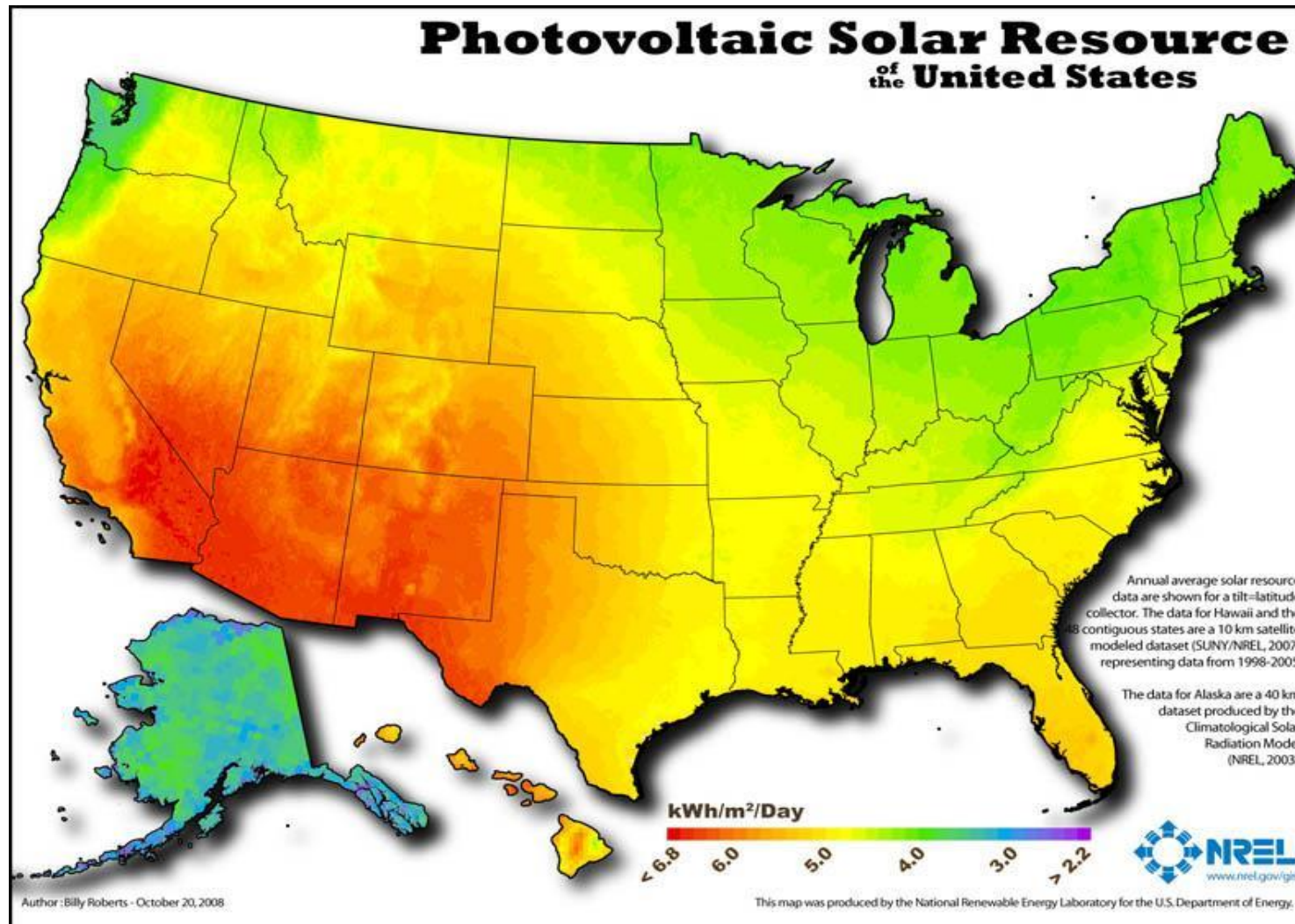


# MEP ENGINEER

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- Piezoelectricity
- Operable Windows
- Solar Hot Water System
- Water Storage

# Photovoltaic Essentials - Mapsearch



# SPOT info

		Spatial Binning			
Design Illum		< 33%	33%-66%	66%-100%	> 100%
Workplane Area		1%	38%	16%	45%

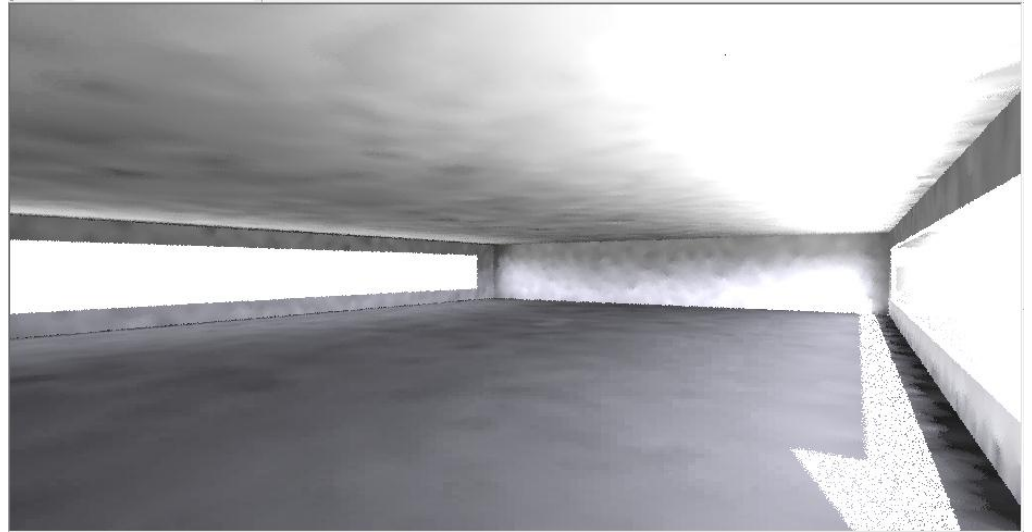
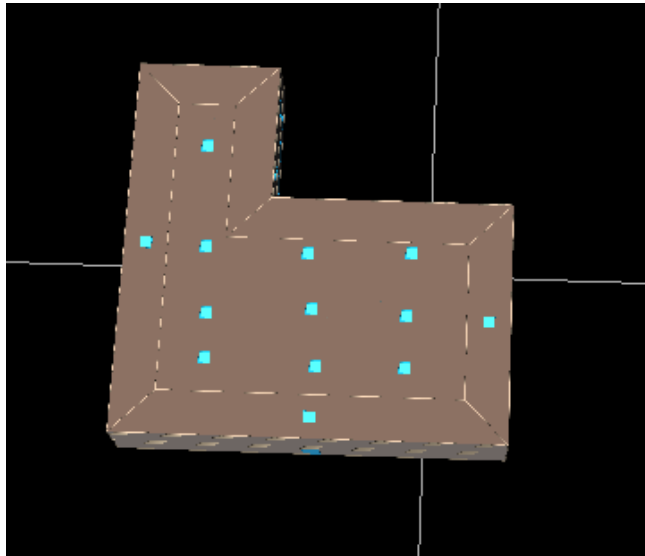
  

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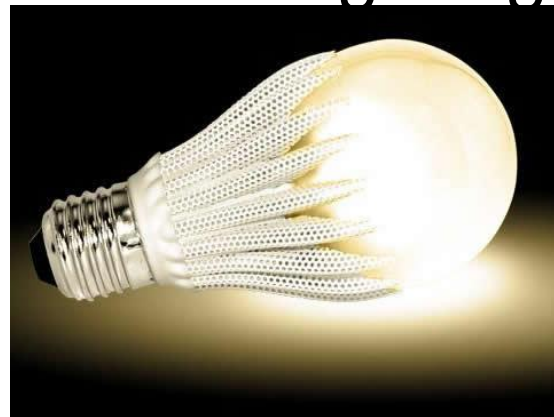


# Natural Heating and Lighting

- Large South and North Facing Windows



- Smart Lighting



(eQuest)

# End



Thank You for your consideration!