



***The High Performance School Site:  
Envisioning a Campus that Enriches Our Children and  
Creates a Healthier Natural Environment***

## Who We Are:

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Living Building Challenge Ambassador

Human Nature, Inc.

# What is a High Performance School Campus?







## **What is the character of most school landscapes/sites?**

- **The landscape consists of left over areas between buildings and parking lots**
- **Grass with a few trees**
- **Open, grassy multi-purpose field for play**
- **Asphalt or concrete area for activities that require a clean, dry, and hard surface**
- **Little or no direct contact with nature**
- **Site is not part of curriculum**
- **No environmental or educational benefits**

**LEED Gold**



## LEED Gold



## Is there a hidden education that we are unknowingly teaching our children?

Our relationship to the landscape isn't important.  
Nature is not the place to learn about the world firsthand.

**There is growing evidence that children  
need to be in contact with nature.**

**But why?**

- **Stimulates the 5 senses**
- **Fosters their cognitive growth and maturity**
- **Promotes self-esteem and self-reliance**
- **Provides exercise and overall physical well-being**
- **Helps them focus better during class**
- **Teaches them how all things are interconnected and interrelated (ecosystems, habitats, watersheds, web of life, etc.)**
- **Teaches them humility and respect for their place in the world**

## So...what if the landscape around our schools could teach our children about:

- **The four seasons, the water cycle, and other natural processes?**
- **How to grow food and other resources?**
- **Our local plant and animal species?**
- **How to build and construct things using natural materials?**
- **How to study nature for clues to solve our everyday problems?**
- **How to be inspired by nature to produce art and other creative endeavors?**

JD3

Proposed listing (to be supplemented by subsequent slides and descriptions):

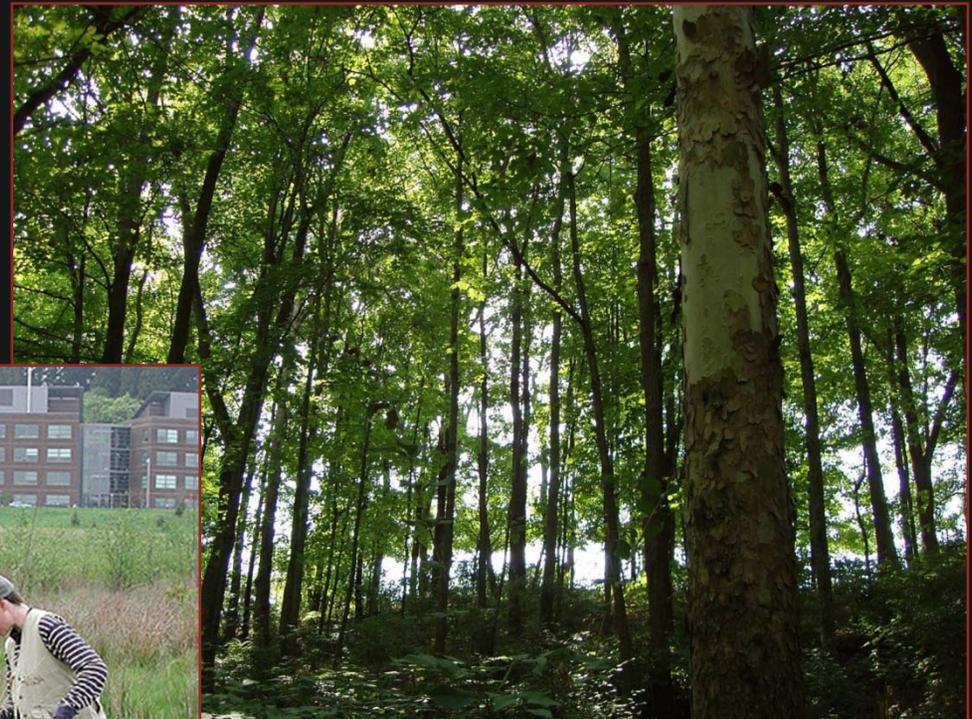
- Natural areas
- Interaction
- Educational opportunities
- Green technologies
- Stewardship

Joseph Danyluk, 3/25/2009

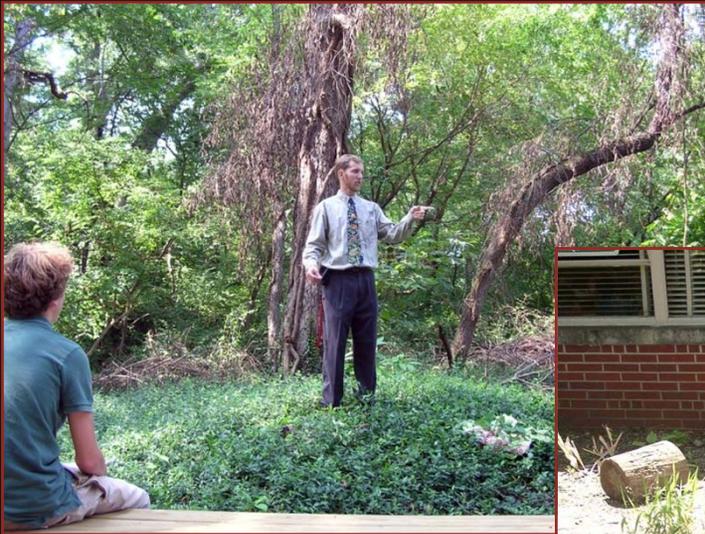
# What if...the school site became a place for learning, recreation, relaxation and contact with nature?



# What if...the school grounds protected, restored, or supported natural areas and habitats?



# What if...there were many opportunities for children to interact with and learn about nature and natural systems?



# What if...the site was reconnected to the water cycle and taught children how to be good stewards of water resources?



# What if...the school site showcased sustainable technologies and systems?



# What if... the school site promoted long term understanding and care of the the natural environment?



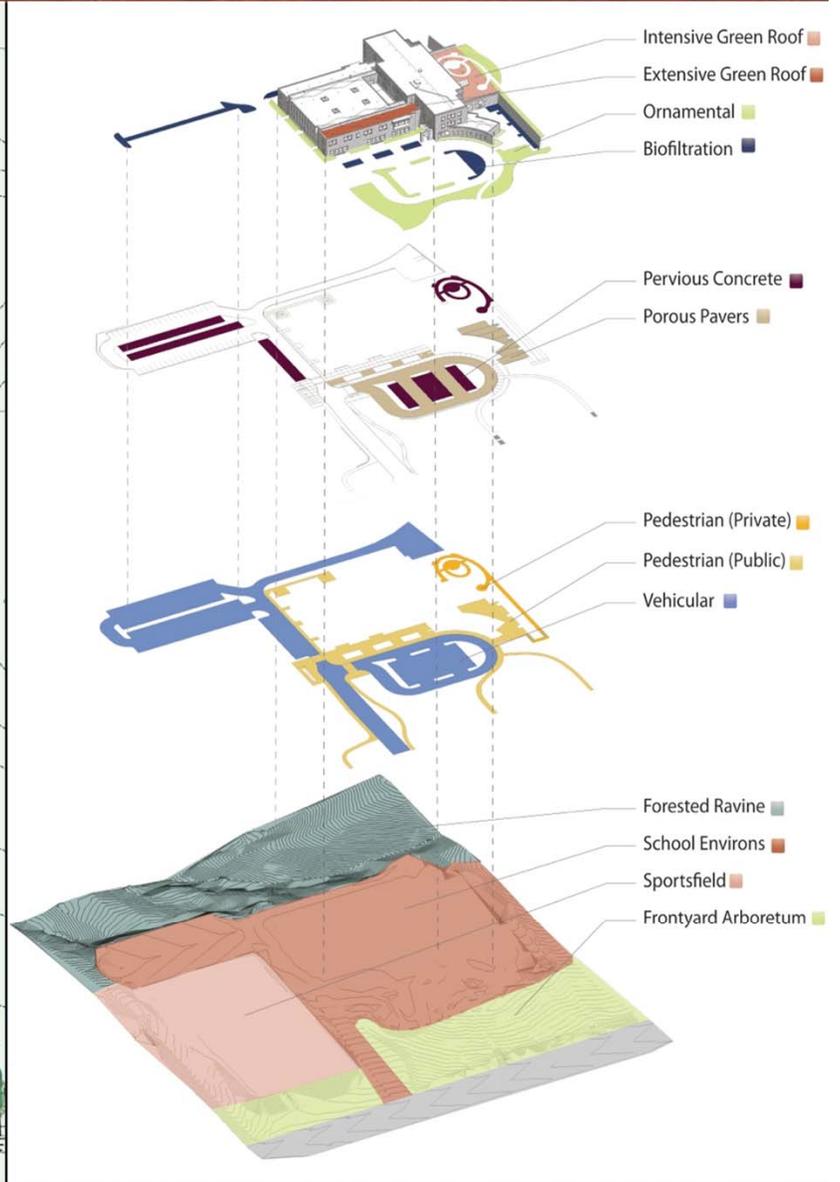
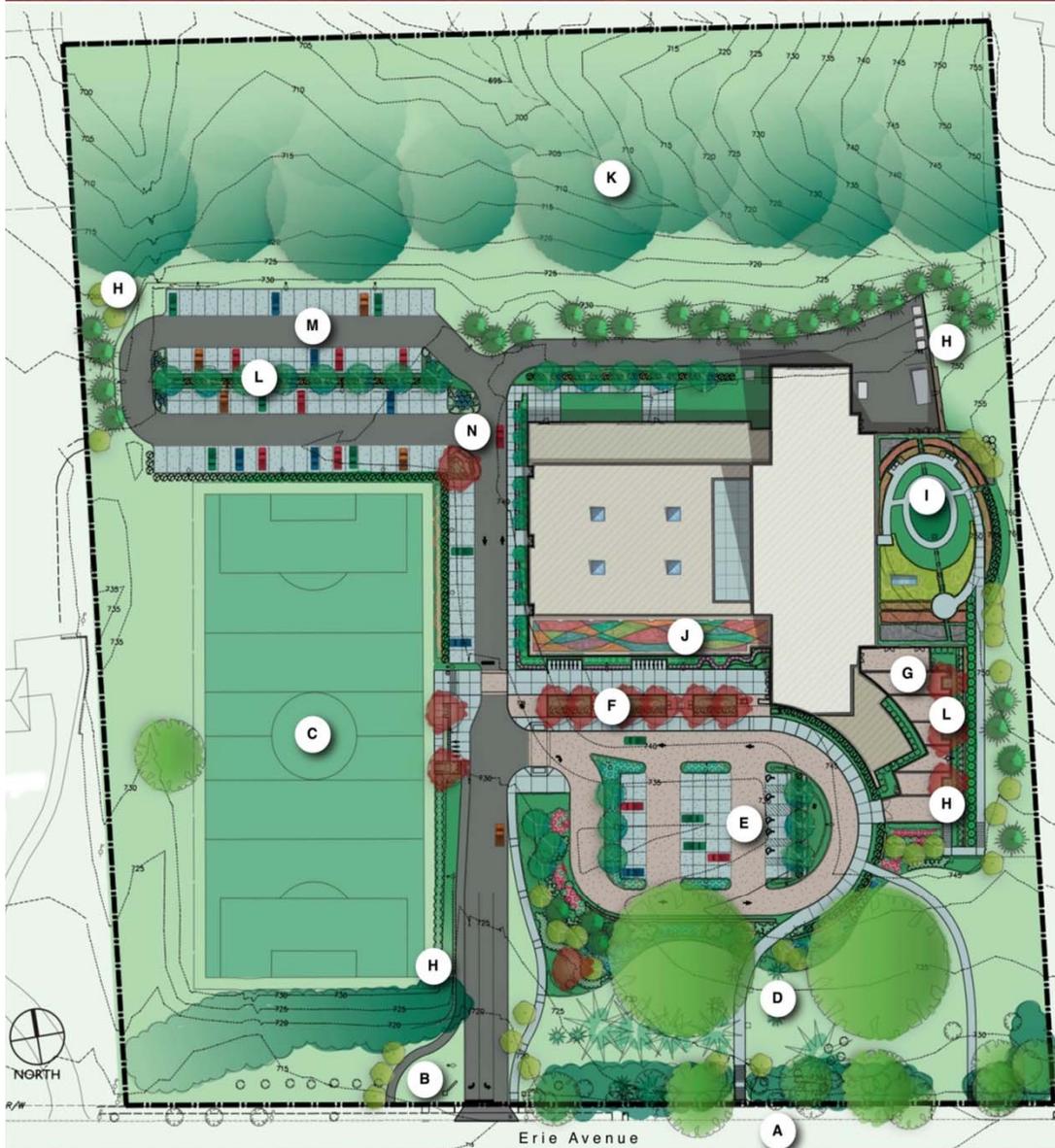
## **With these things in mind, how might we now define a high performance school site?**

- **Resource efficient**
- **Ecologically beneficial stormwater management**
- **Habitat restoration**
- **Addresses the whole child (body, mind, and spirit)**
- **Maximum interaction with nature**
- **Places for individual and social activities**
- **Addresses microclimate for human comfort**
- **Tight integration between site and building(s); systems work together for the benefit of both**

# High Performance Site Case Study:

## Clark Montessori Junior and Senior High School

Cincinnati, OH















# High Performance Site Transformation:

## Kenton County STEM Campus

Edgewood, KY

# Green Campus & Stormwater Master Plan

## Site Plan with New Turkey Foot Middle School



Project Funded by EPA 319 Grant



**LEGEND**  
- - - - - property line

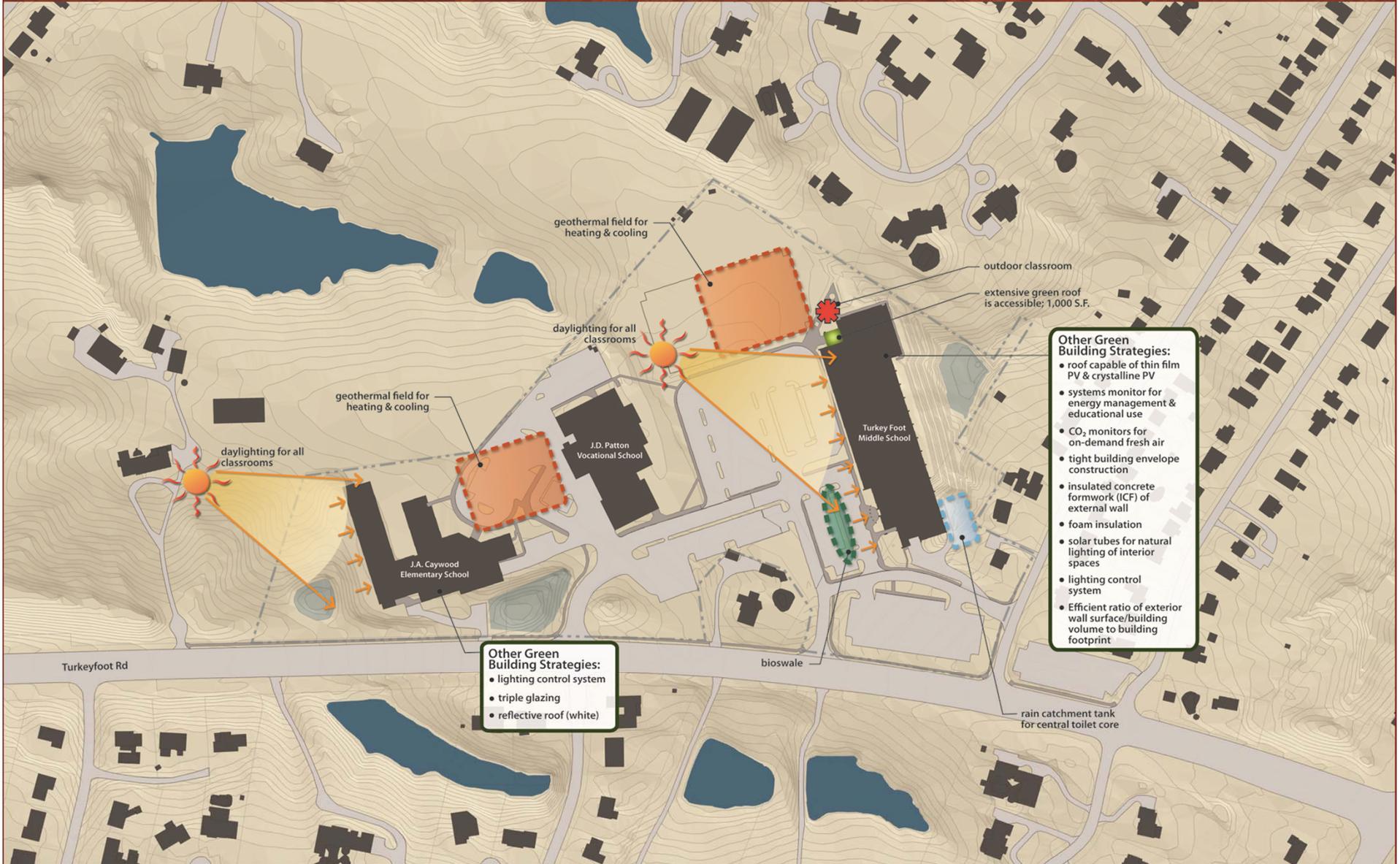


# Green Campus & Stormwater Master Plan

## Current Green Features & Strategies



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# The Master Planning Process

**Awareness**



**Exploration**

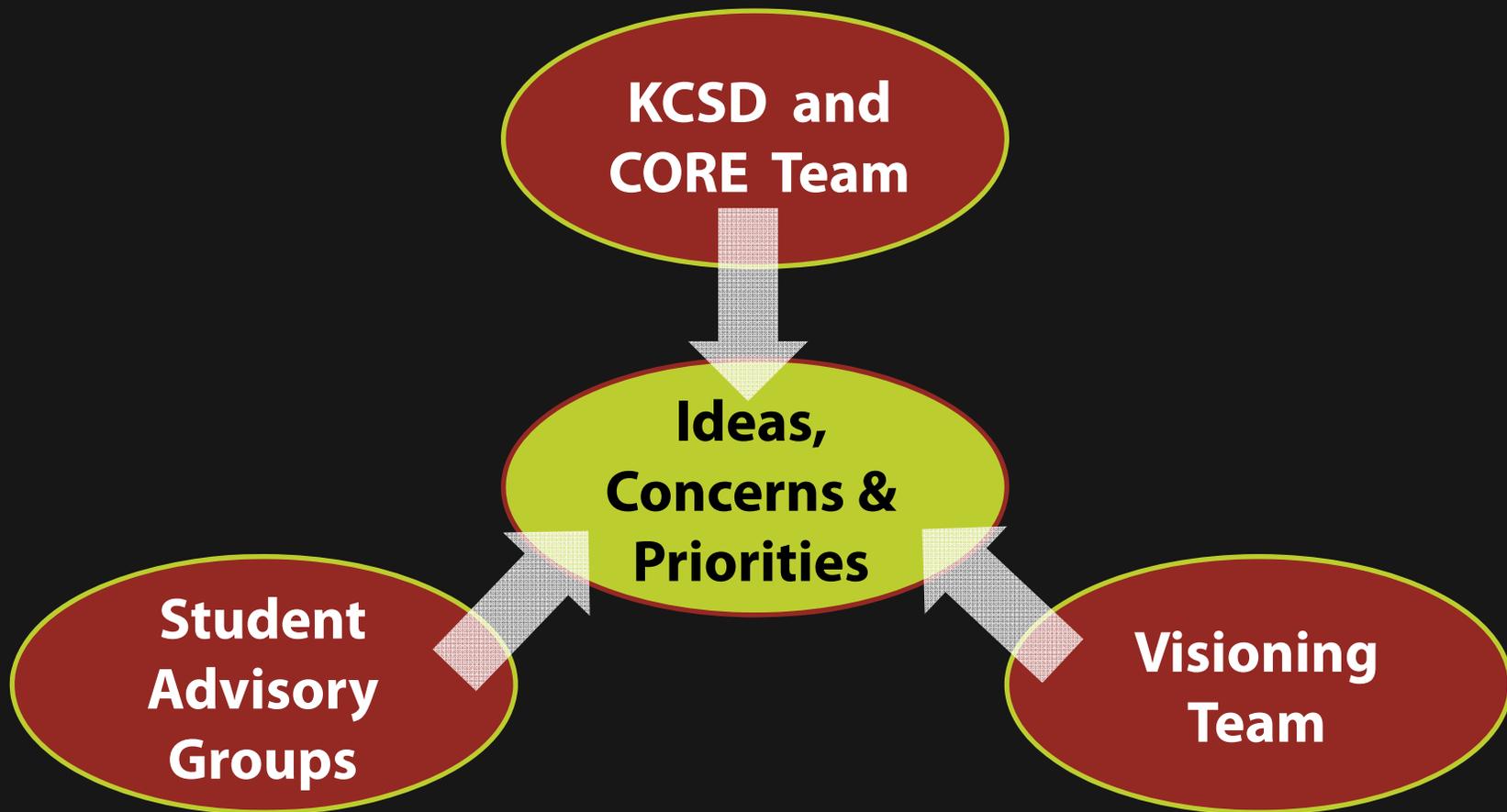


**Vision**

# AWARENESS

**Learning Together about the Unique  
Cultural and Natural Gifts of the Site  
and the Programmatic Needs of the  
Campus Community**

# Awareness: Sharing Knowledge & Ideas



# Awareness: Site Inventory



Existing Green Features



Vehicular & Pedestrian Circulation



Wind Direction



Site Drainage



Soil Permeability



Open Space & School Connections

# EXPLORATION

**Developing a Range of Design  
Concepts that Test Various Themes  
and Levels of Change to the Campus**

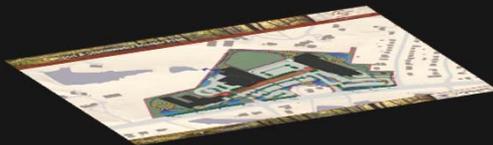
## Essential Elements of the Campus

- **Outdoor learning venues**
- **Green infrastructure**
- **Green space and access to nature**
- **Campus identity**
- **Improved pedestrian and vehicular systems**
- **Community interface**
- **Research**

# Exploration: Design Concept Gradient

## Concept 1:

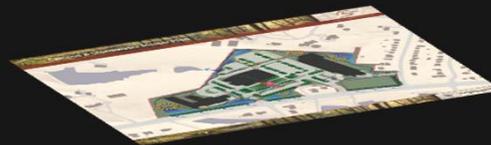
### Maximizing Opportunities within the Existing Framework



- Maintain current/proposed locations of buildings
- Consider minor changes to existing paving but improve pedestrian network and integrate small stormwater BMPs
- Maximize and link greenbelt enhancements and gateway arrival experience, including upgrades to existing stormwater detention facilities

## Concepts 2:

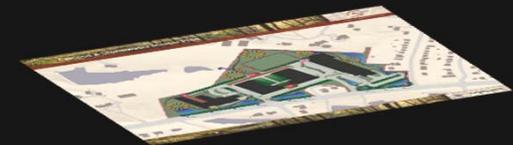
### Modifying the Existing Framework



- Recommend minor changes to Patton/STEM building
- Reorganize vehicular & pedestrian networks for improved efficiency, legibility, & connectivity
- Enhance community interface & linkages with site with walkways, shared facilities, and amenities

## Concept 3:

### Creating a Bold, New Green Campus Vision



- Celebrate the new STEM Academy building as the central, iconic feature of a bold, new campus organization
- Promote the campus as a visible, regional model of sustainable design, curricula, technologies, & community education
- Establish a new, cohesive campus structure to accommodate the full needs of all of the schools
- Maximize the density & efficiency of parking, including the potential use of structured parking

# VISION

**Synthesizing Stakeholder Input on  
the Conceptual Alternatives into a  
Single, Integrated Master Plan**

# Green Campus & Stormwater Master Plan



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## Existing





# Campus Front Yard

## Key Features:

- 
- Learning Terrace
  - Bioretention Labs
  - Wetland Lab
  - Solar Totems
  - Solar Umbrellas with Seating
  - Interpretive Signage
  - Forest & Meadow Restoration
  - Hydropower Demonstration Lab
  - Grasspave Fire Lane Access
  - Habitat Trail Connection to Rest of Campus
  - Community Trail Access

# Caywood Courtyard

## Key Features:

- Circular Outdoor Classroom/Lab
- Rain Garden Lab
- Student-made Artwork
- Cistern
- Raised Planting Beds
- Interpretive Signage
- Outdoor Tool/Storage Shed with Green Roof
- Enhanced Play Area with Natural Play Elements
- Water Feature/Fountain
- Famous Quotes in Pavers
- Birdhouses and Bat Houses
- Formal and Informal Paths Through Garden
- Connection to Campus-wide Trail System

## Turkey Foot Outdoor Classroom

### Key Features:

- Outdoor Classroom/Lab
- Rain Barrels
- Green Roof
- Student-made Artwork
- Biofiltration
- Raised Planting Beds
- Step Pools
- Interpretive Signage
- Enhanced Retention Area with Meadow and Wetland Plantings and Trails for Student Access
- Learning Terrace with Tree Canopy Overlook Deck
- Outdoor Storage
- Solar Powered Cellphone/Computer Recharge Station(s)
- Connection to Campus-wide Trail System

# Existing and Planned Site Features



## Turkeyfoot Middle School: Green Roof & Rainwater Harvesting

# TURKEY FOOT CAMPUS WATER QUALITY ASSESSMENT

NAME: STEFMI CLASSES

DATE: August 26, 2011

PERIOD: 2nd, 4th, 6th TEACHER: Humphrey

## QUESTION:

What is the quality of water on the Turkey Foot campus?

## HYPOTHESIS:

Students believed the vegetative roof would have an effect on the turbidity of the water.  
 Students also believed the water draining below the property in the back of the school may contain an elevated level of phosphates and nitrates.  
 Students further believed the non-potable water gathered and used by the building may contain an elevated level of acid.

## MATERIALS:

Water samples from Vegetative Roof, Rain Water Catchment System and Lower Drainage Area  
 Water Quality Test Kits

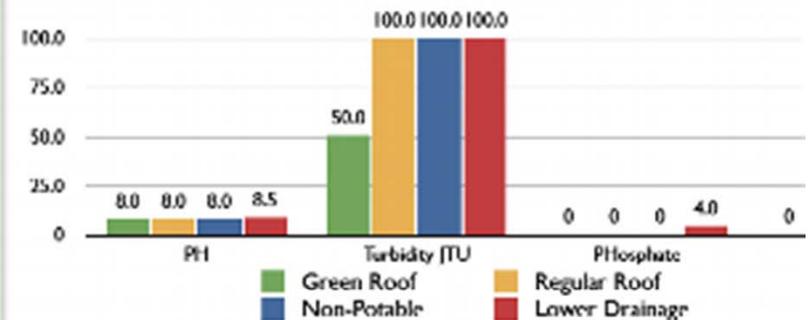
## PROCEDURE:

Students gathered water samples from the vegetative roof, rain water catchment system and lower drainage area. Students then conducted water quality test based on their hypothesis.

## CONCLUSION:

The vegetative roof has a lower turbidity than the regular roof.  
 The water draining below the school property did show elevated levels of phosphate but normal levels of nitrates.  
 The non-potable water used in the school's toilets did not show an elevated level of acid.

WATER SOURCE	PH	TURBIDITY JTU	PHOSPHATE	NITRATES
GREEN HOOP	8.0	50.0	0.0	0.0
REGULAR ROOF	8.0	100.0	0.0	0.0
NON-POTABLE	8.0	100.0	0.0	0.0
LOWER DRAINAGE	8.5	100.0	4.0	0.0





## Turkeyfoot Middle School: Alternative Energy Experiments



## STEM Campus Entry Rain Garden





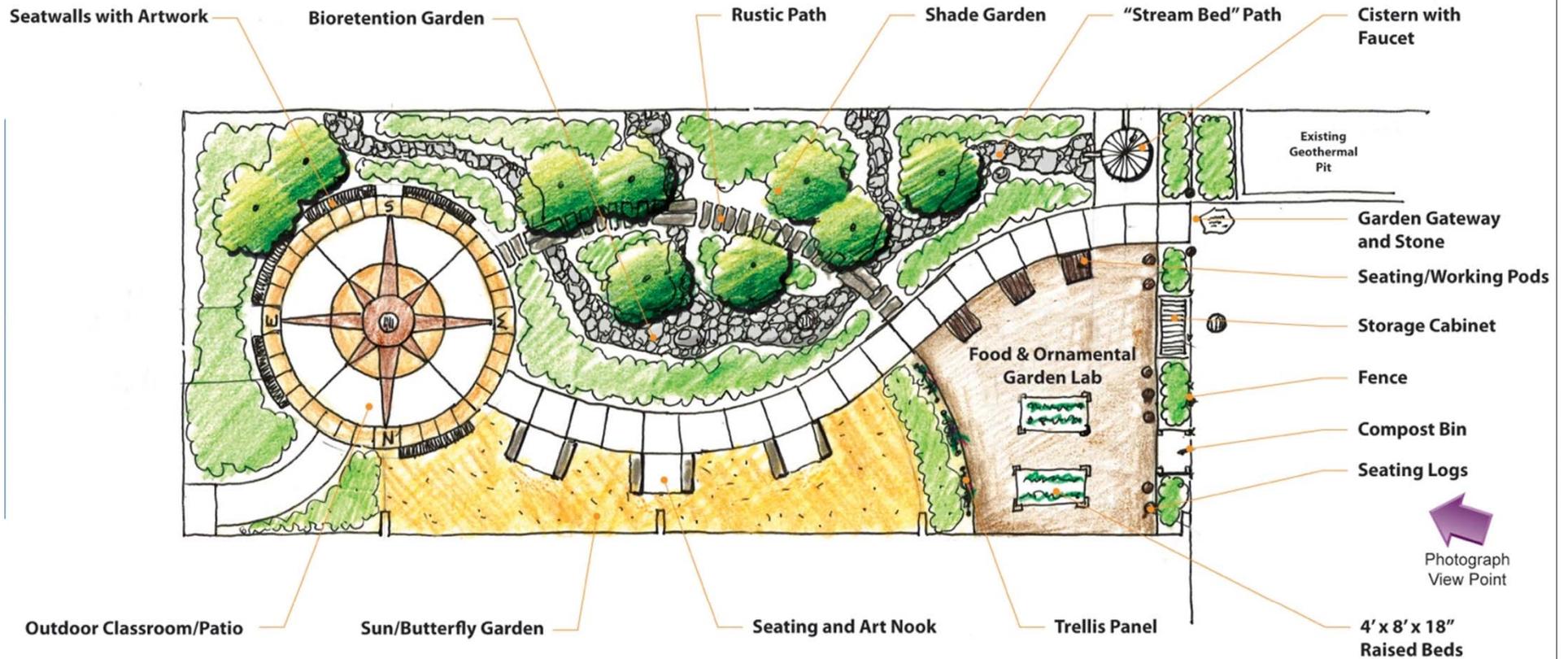
## STEM Campus Entry Rain Garden



## Caywood Elementary Courtyard: Existing Site



# Caywood Elementary Courtyard: Proposed Concept



# Green Campus & Stormwater Master Plan



Project Funded by EPA 319 Grant

## Conceptual Diagram



**“The environments we create show our children what we value”**

**~ Robert Layton**

**Thank You**

