



# PBL Presentation: Outdoor Learning Space - 2014 Forest Glen Addition





# Outdoor Learning Space – Forest Glen

“The new Forest Glen building addition will include the opportunity to **design an outdoor learning space**. How can we best design the outdoor learning space to **maximize the educational effectiveness** for Forest Glen students and teachers.”



**PROBLEM-BASED LEARNING**

## AGENDA

What you need to know in order to design an Outdoor Learning Space -

- **Context**

- Context
- New Planned Outdoor Learning Space / Classroom Addition
- Mathematical Concepts
  - Perimeter
  - Area

- **Design Considerations**

- Climate
- Paving
- Outdoor Furniture
- Landscape

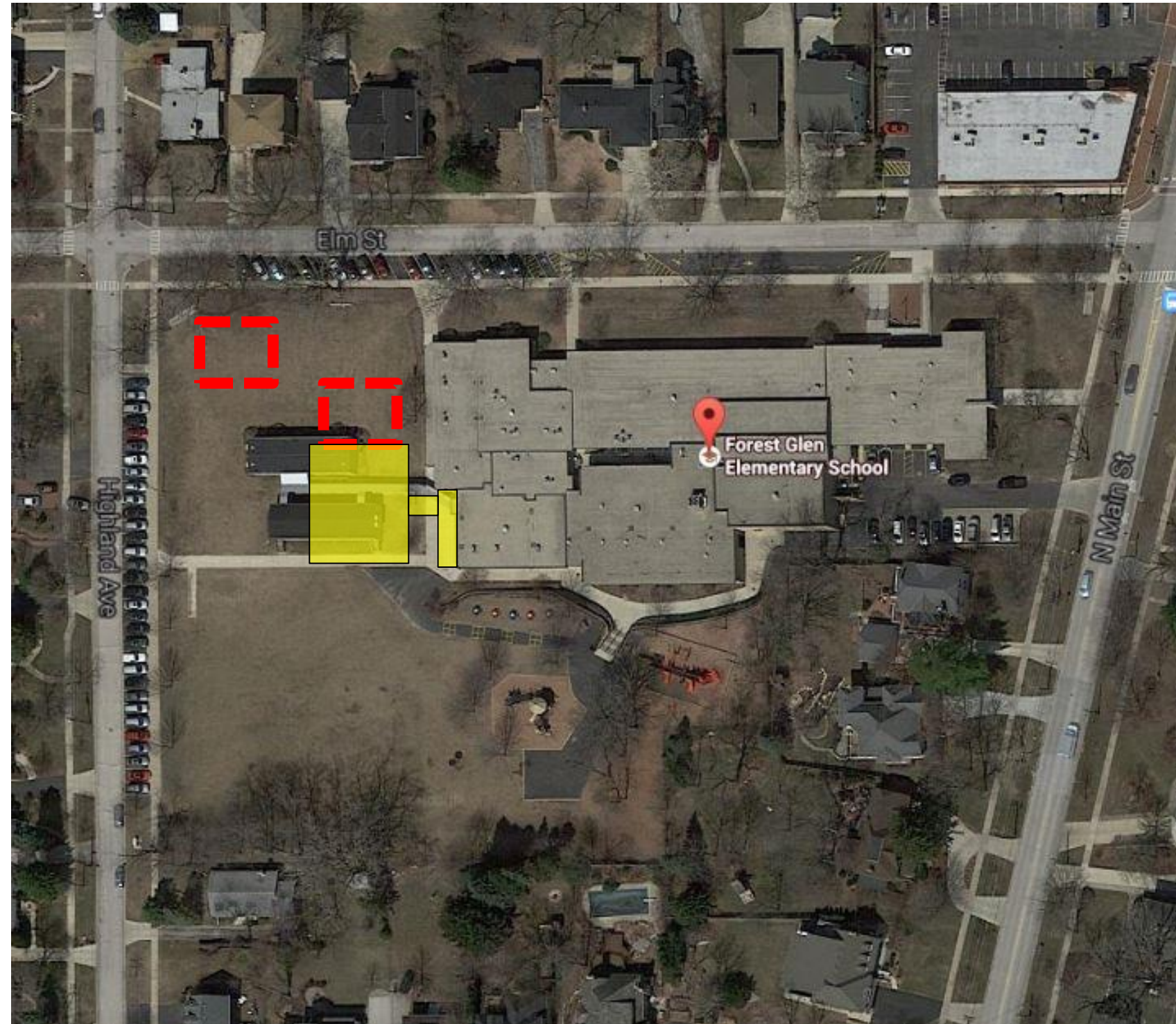
- Outdoor Learning Space Examples

- **User needs**



# Outdoor Learning Space – Forest Glen

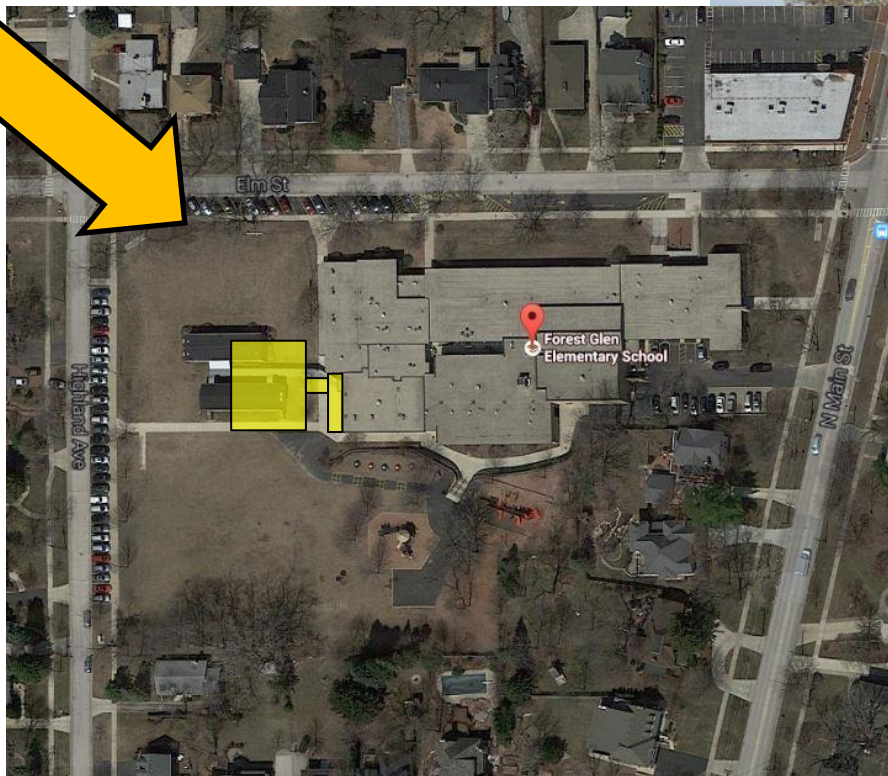
## OVERALL SITE MAP





# Outdoor Learning Space – Forest Glen

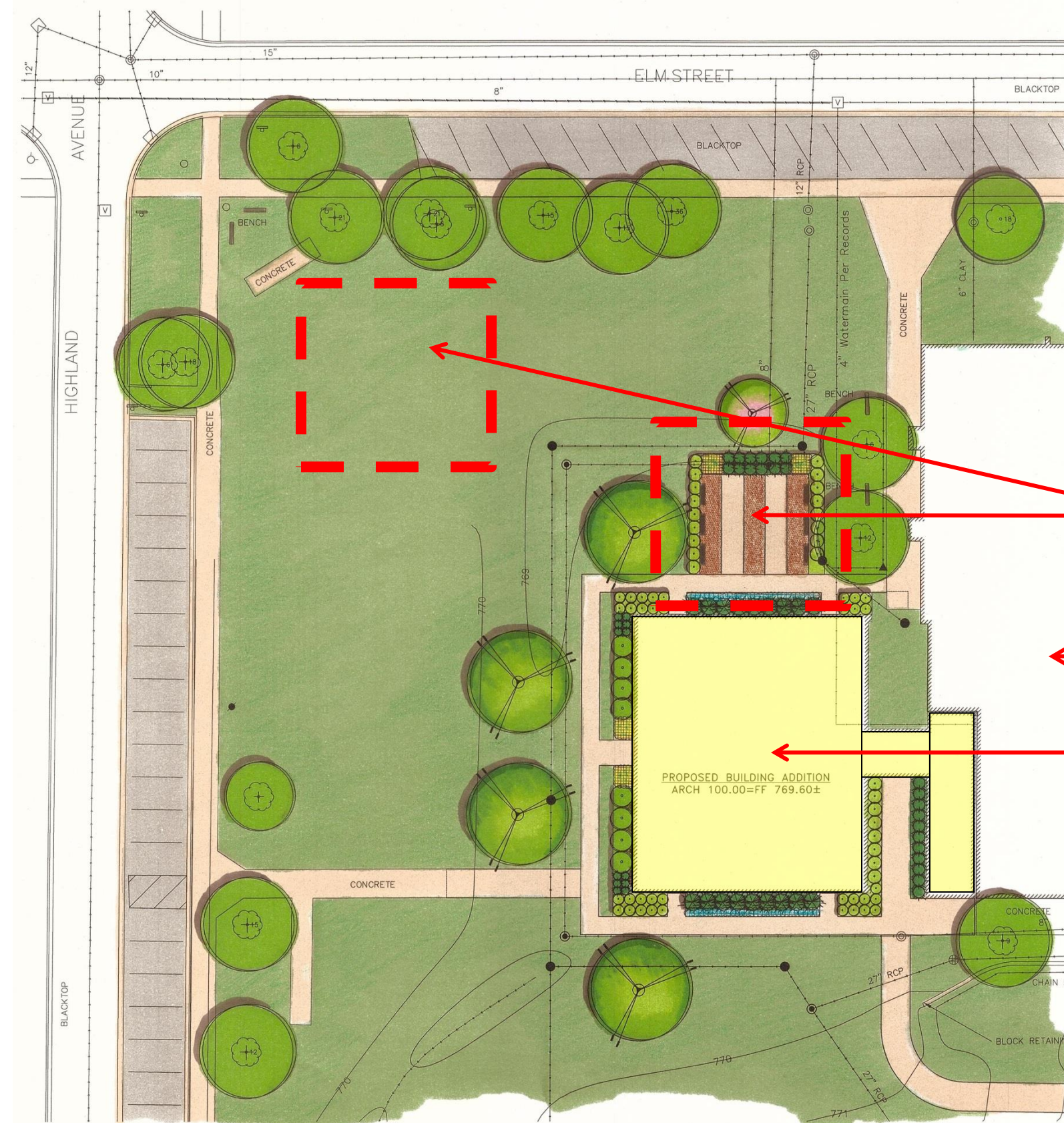
## CONTEXT





# Outdoor Learning Space – Forest Glen

## SITE PLAN



New Outdoor Learning Area

Existing School

New Addition



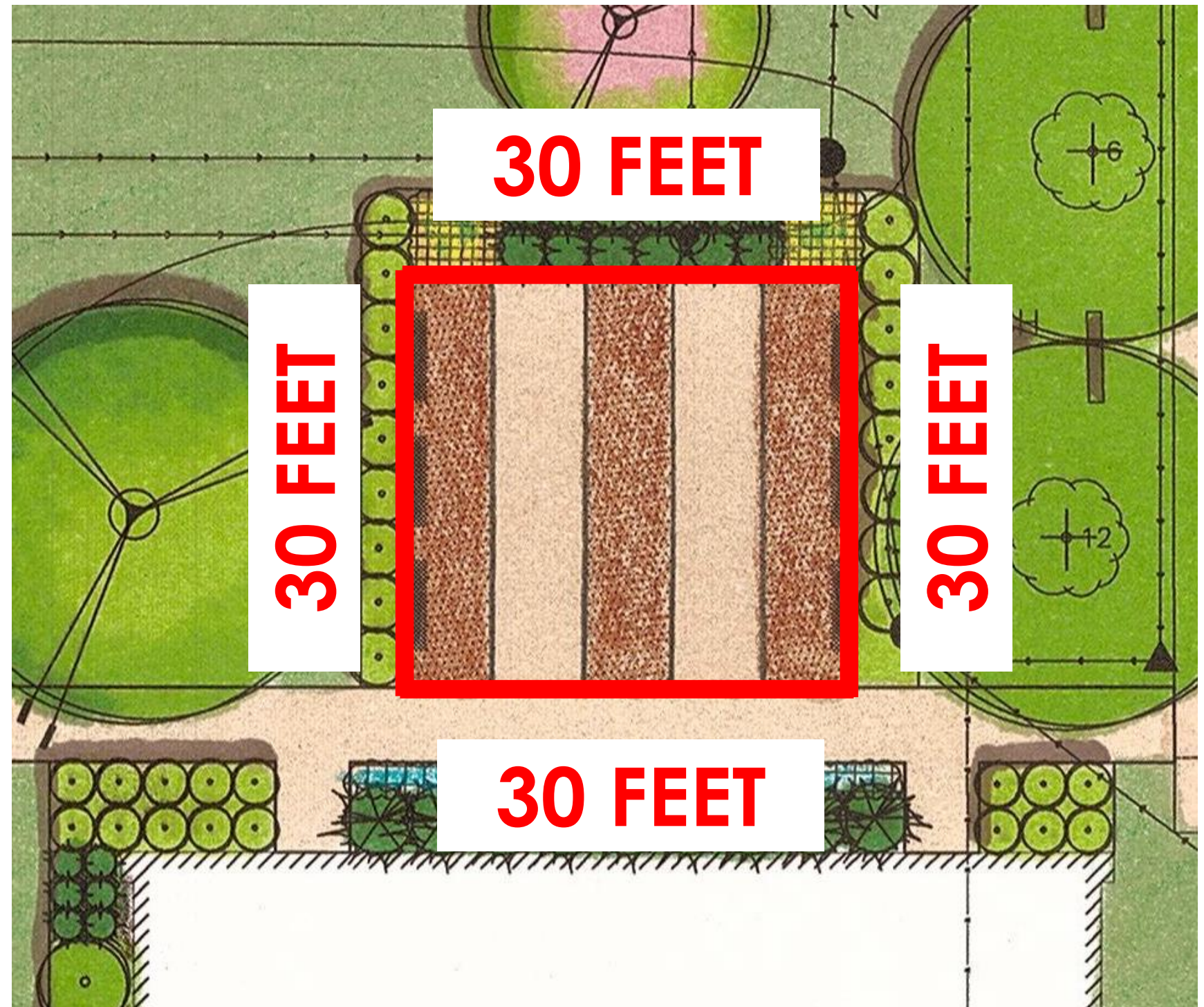


## MATHEMATICAL CONCEPTS

### PERIMETER

- Measurement
  - Feet

HOW DO WE CALCULATE THE PERIMETER?





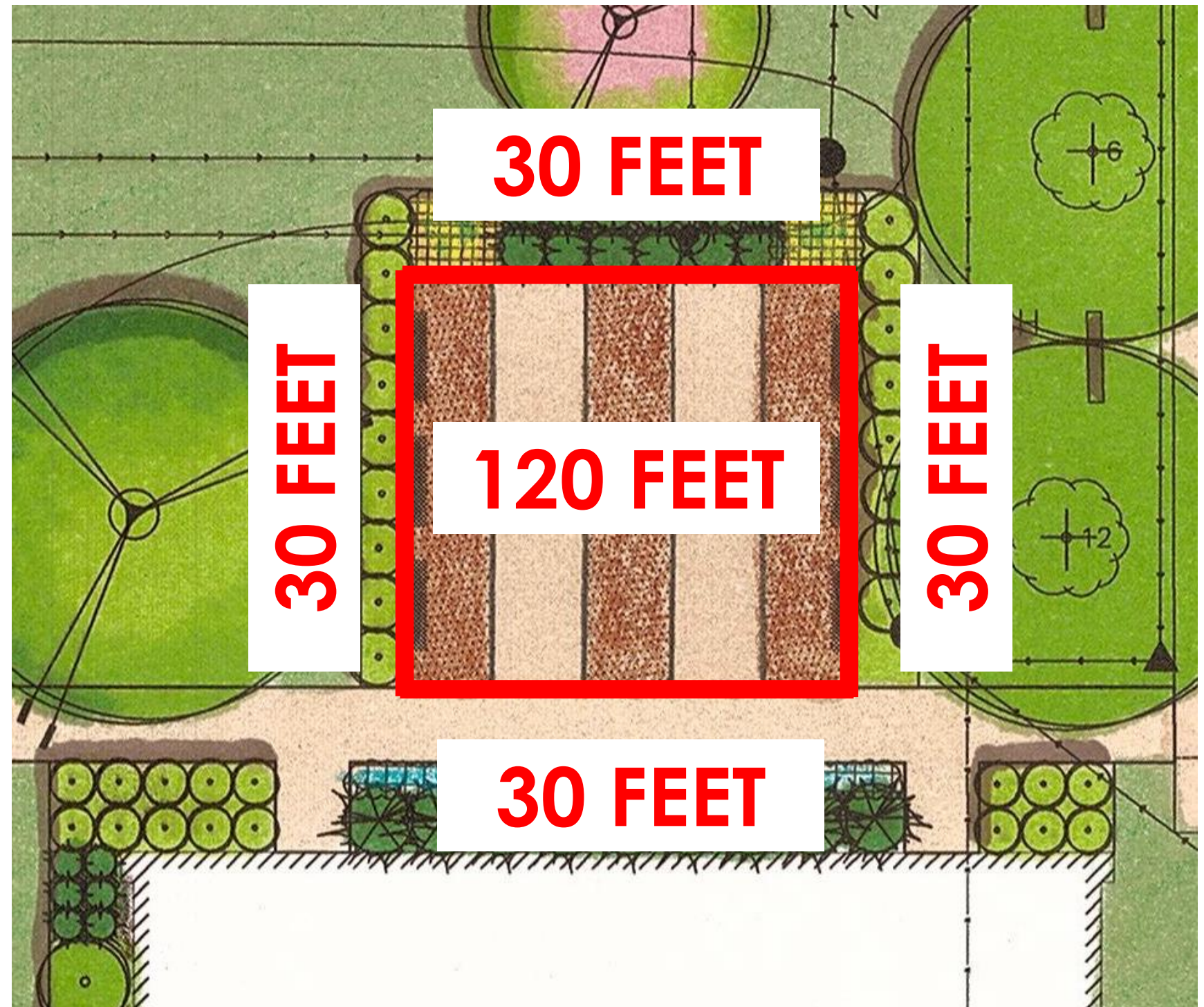
## MATHEMATICAL CONCEPTS

### PERIMETER

- **Measurement**
  - Feet
- **Calculation**
  - Add all perimeter dimensions to get total perimeter dimension

$$30 \text{ feet} + 30 \text{ feet} + 30 \text{ feet} + 30 \text{ feet} = 120 \text{ feet}$$

Why is this important?



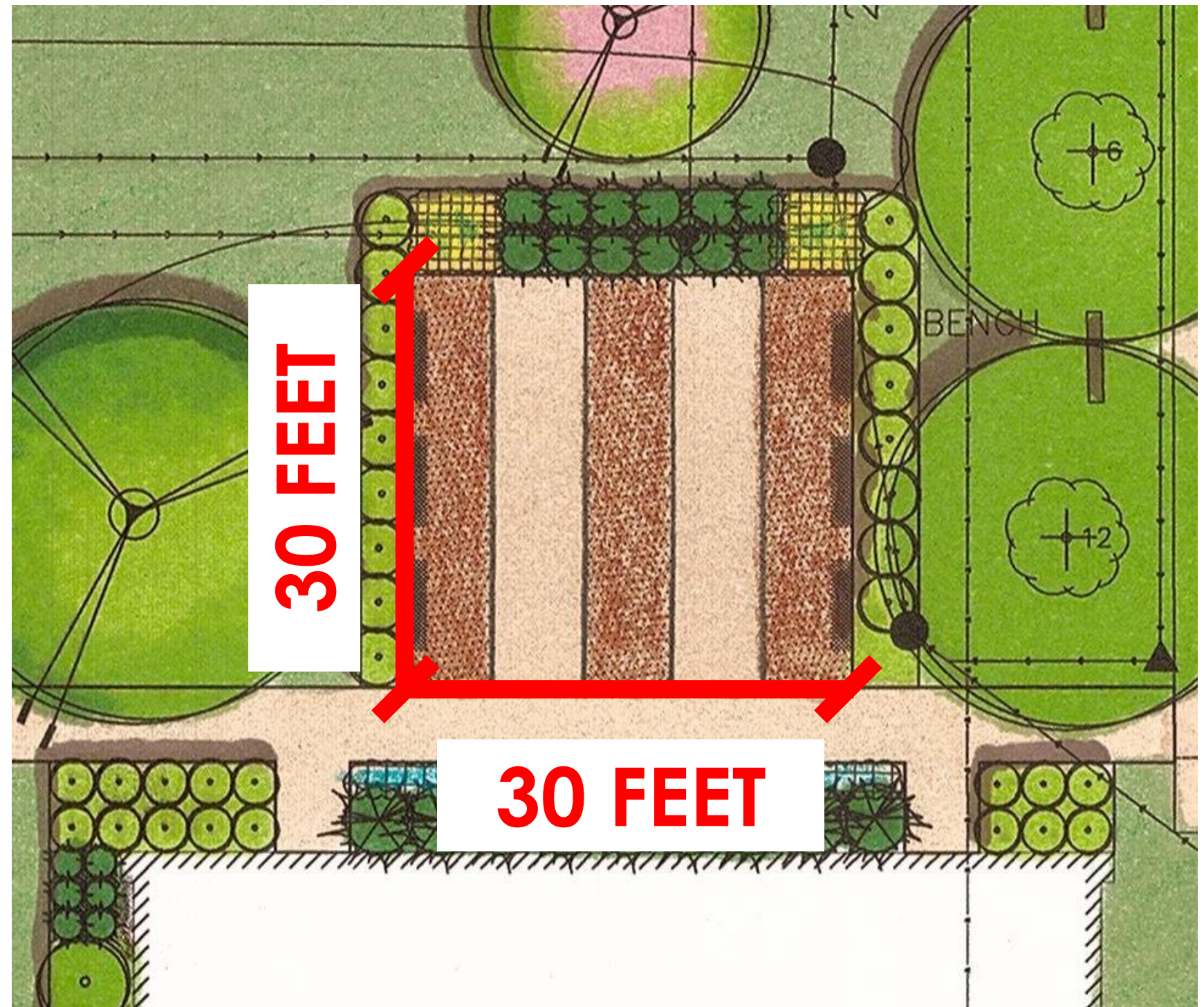


## MATHEMATICAL CONCEPTS

### AREA

- Measurement
  - Square Feet

HOW DO WE CALCULATE THE AREA?





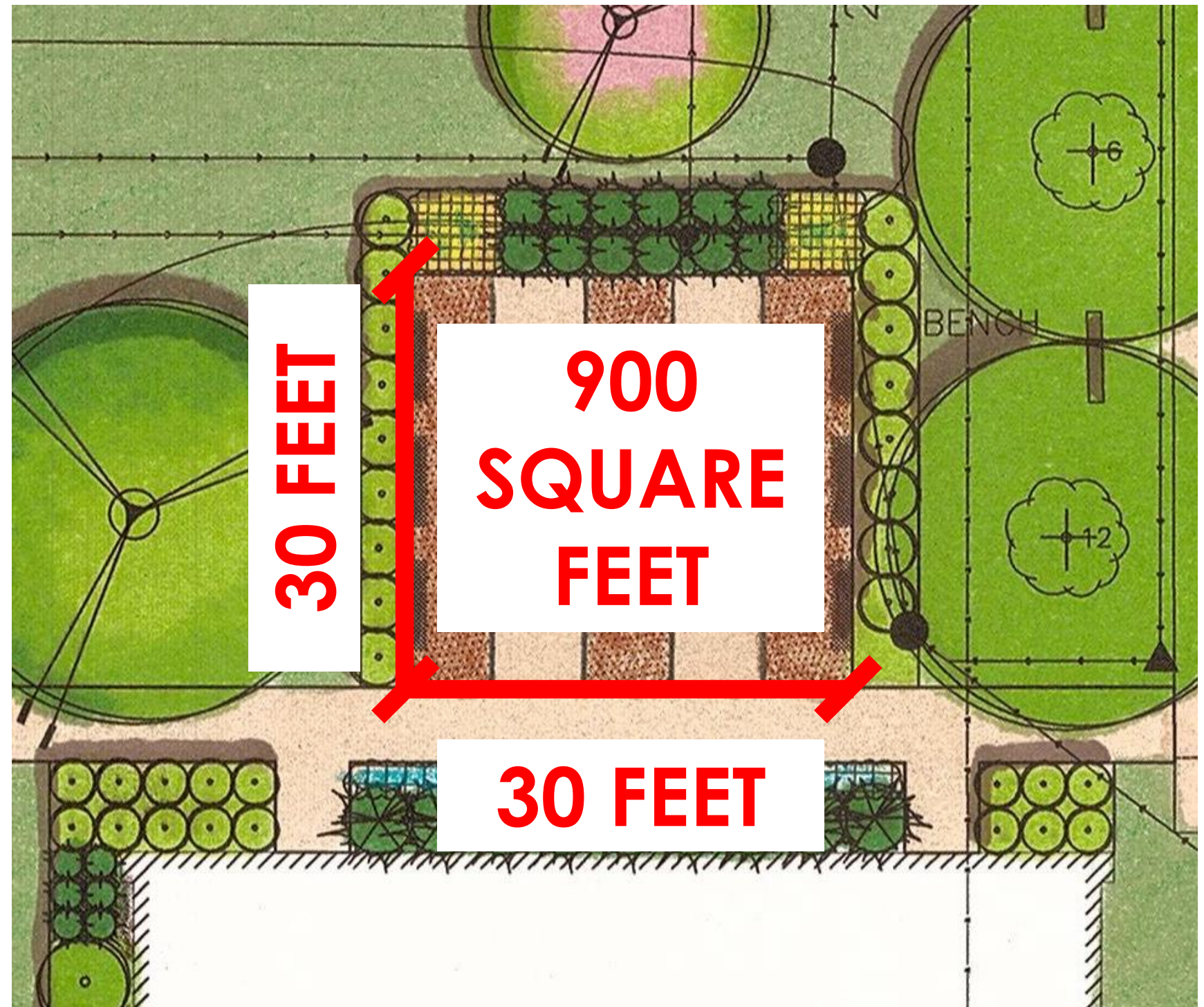
## MATHEMATICAL CONCEPTS

### AREA

- **Measurement**
  - Square Feet
- **Calculation**
  - Multiply perimeter dimensions to get total area

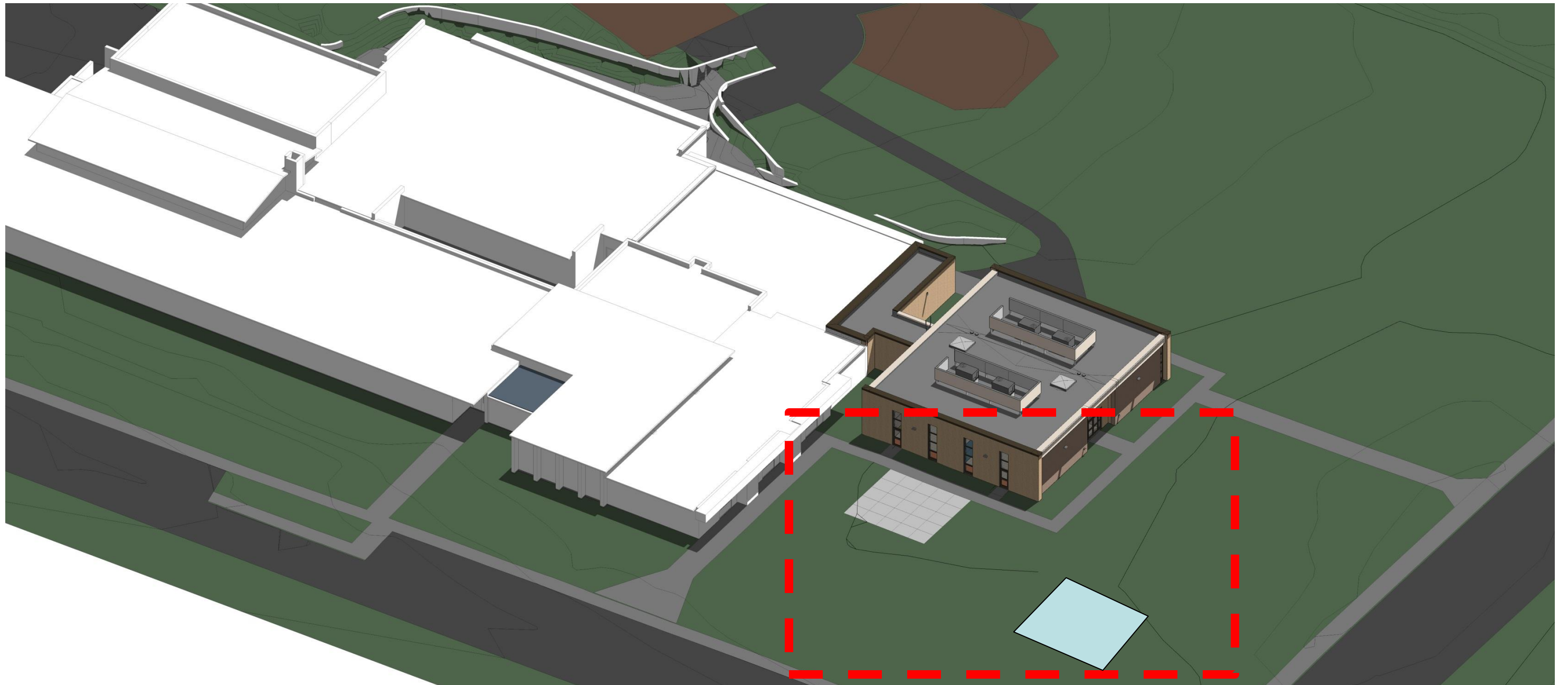
**30 feet x 30 feet = 900 square feet**

**Why is this important?**





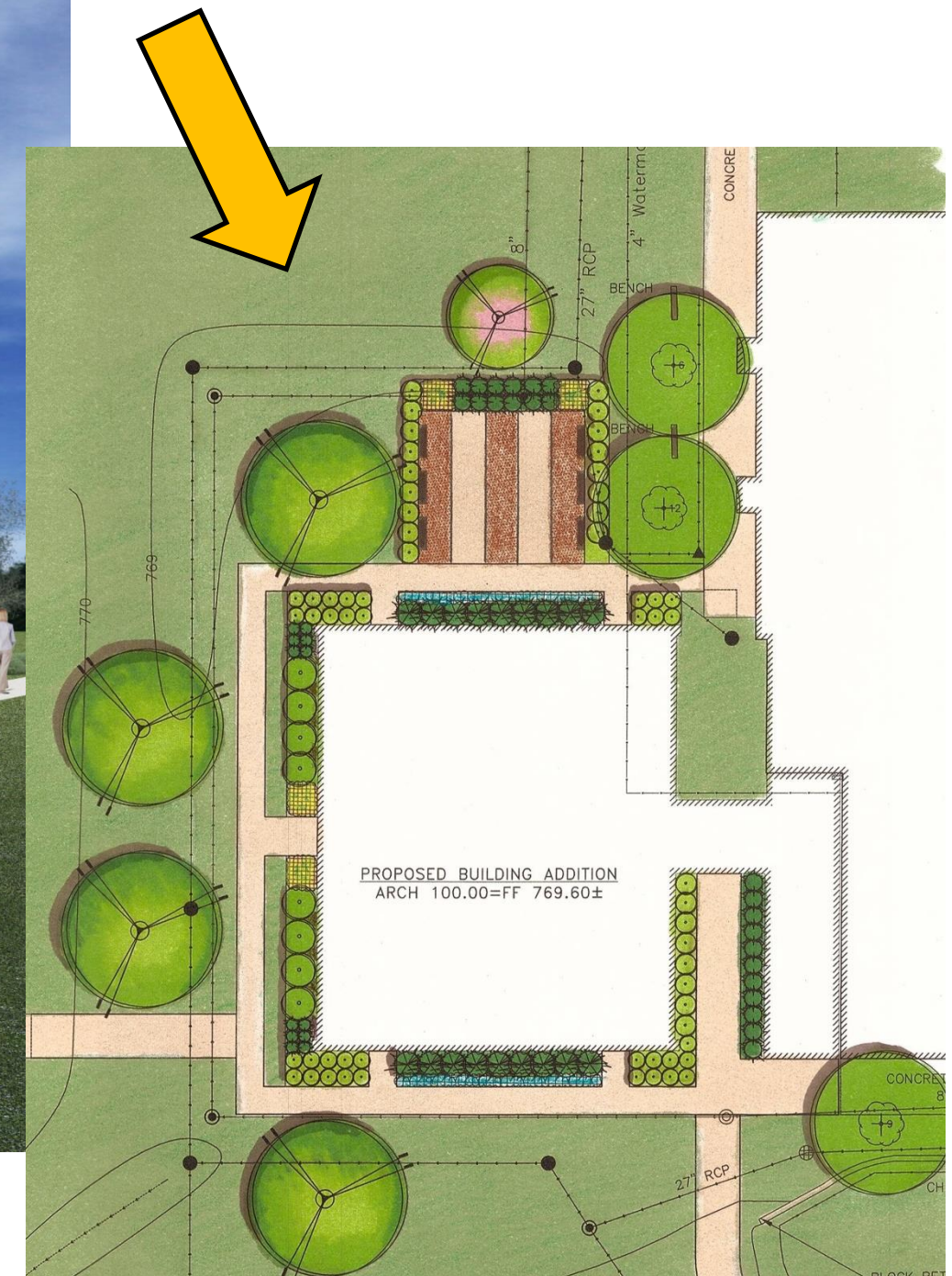
## NEW ADDITION / OUTDOOR LEARNING SPACE





# Outdoor Learning Space – Forest Glen

## NEW ADDITION / OUTDOOR LEARNING SPACE





## CONSIDERATIONS FOR DESIGN

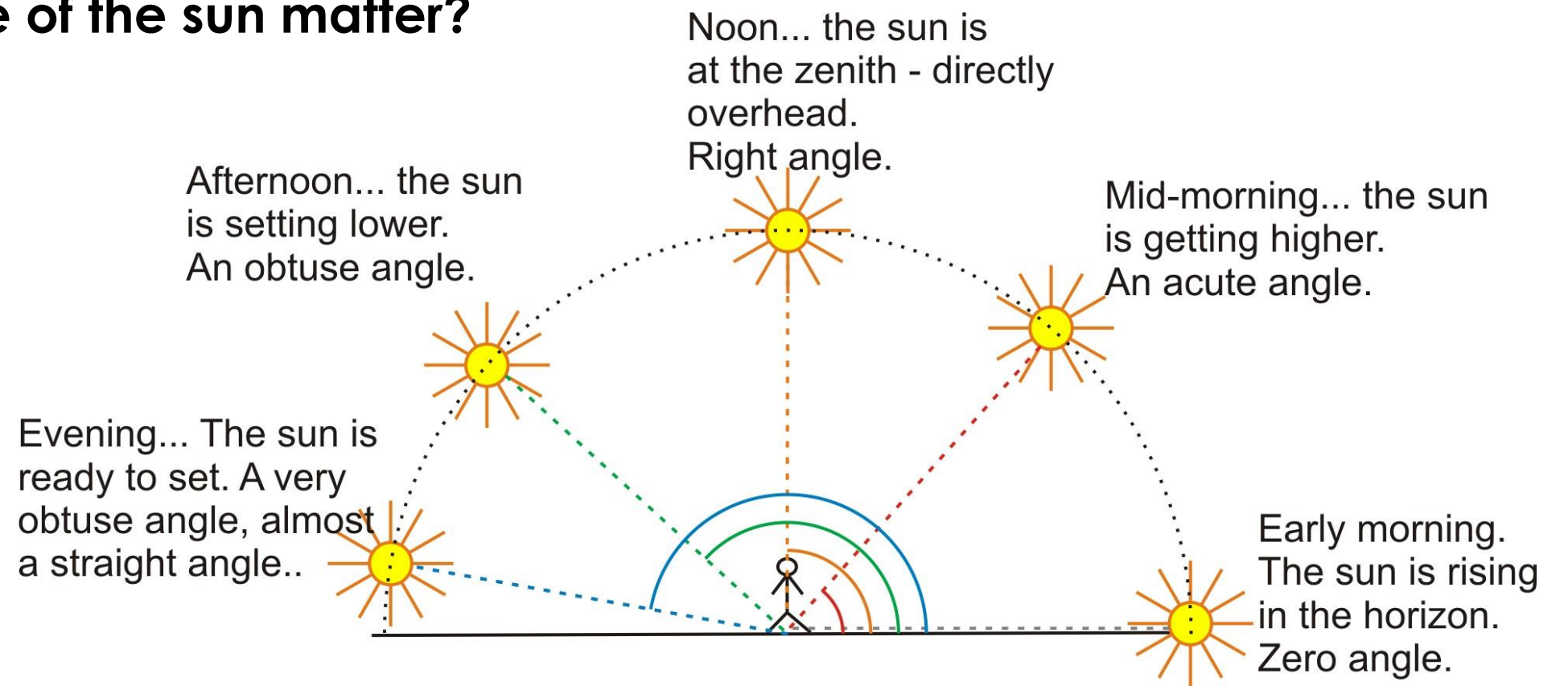
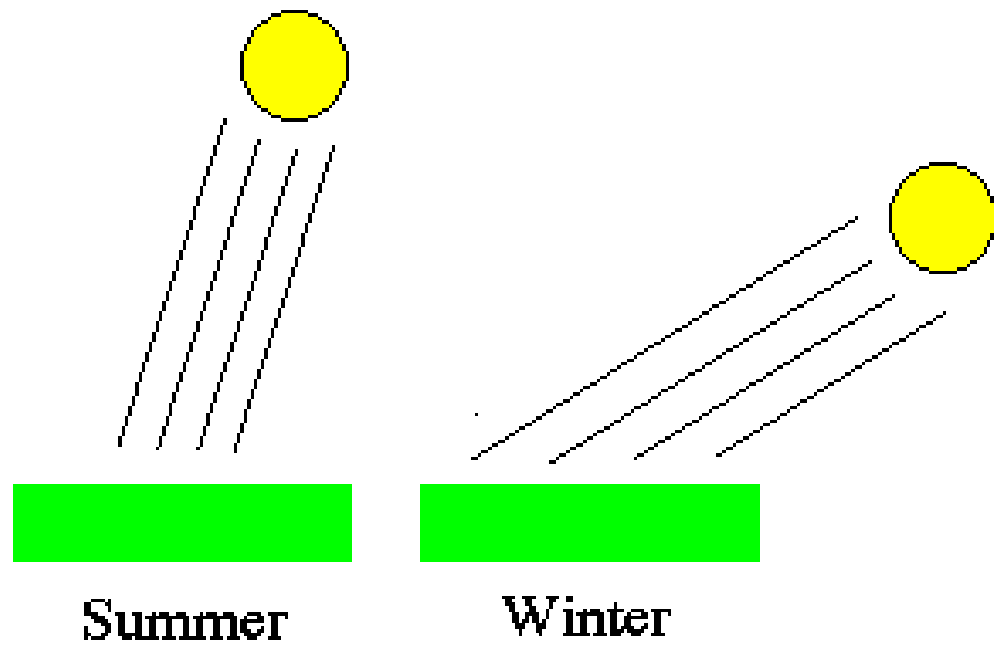
- **Climate**
  - Sun / Shadow
  - Rain / Water
  - Weather Effects
- **Paving**
  - Types
  - Permeable Paving
- **Outdoor Furniture**
- **Landscape**
  - Types
  - Landscape / Tree Placement
  - Rain Gardens
- **Lighting**



## CLIMATE

### Sun / Shadow

Why does the angle of the sun matter?



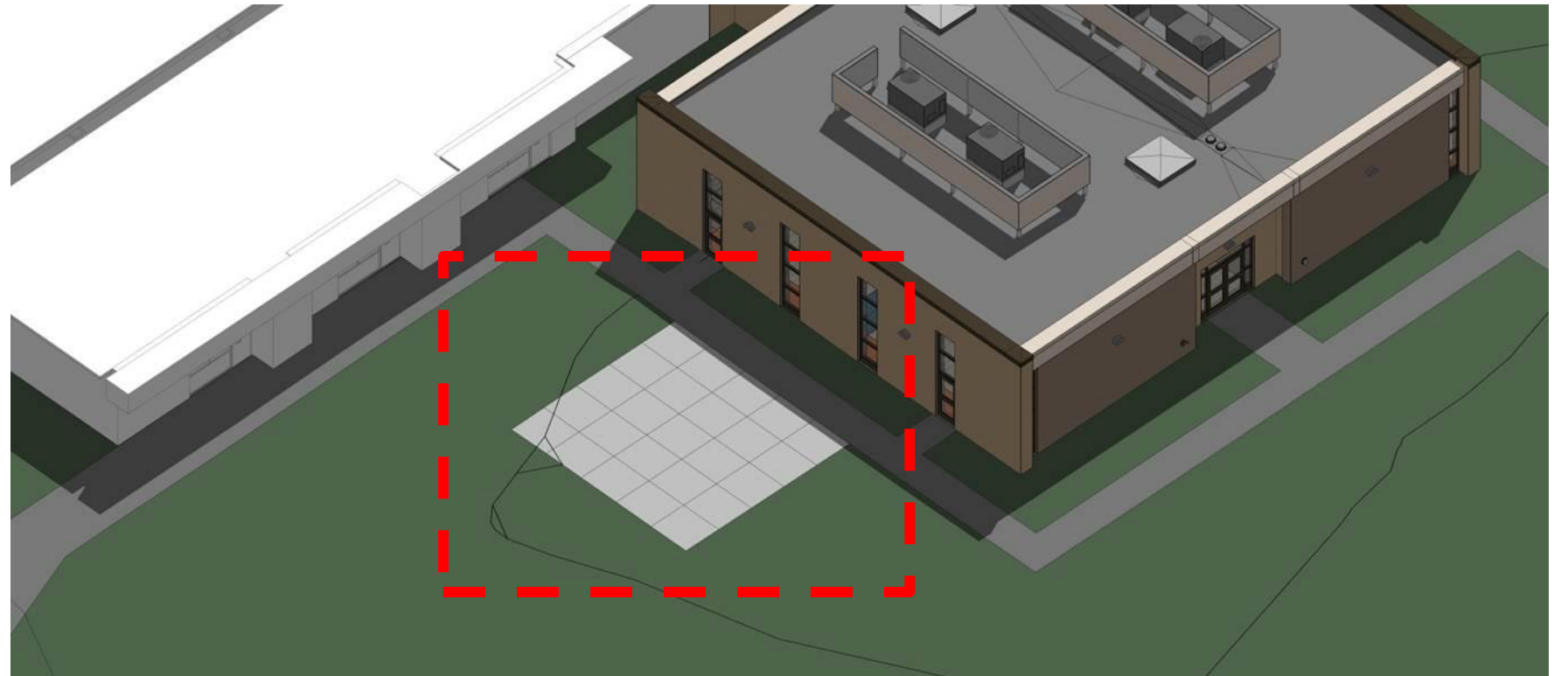


# Outdoor Learning Space – Forest Glen

## CLIMATE

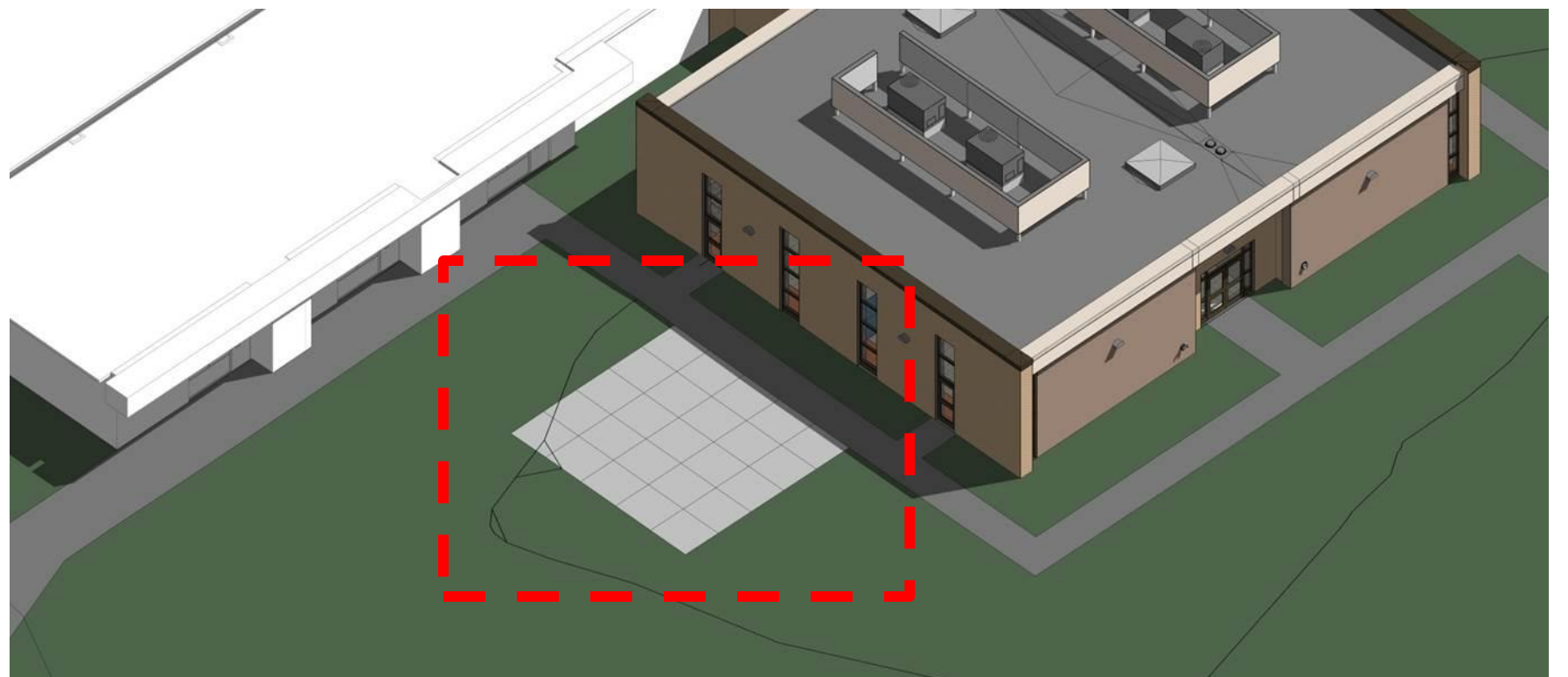
Sun / Shadow

Summer - September at 11:00 am



## SUN

Summer - September at 1:00 pm



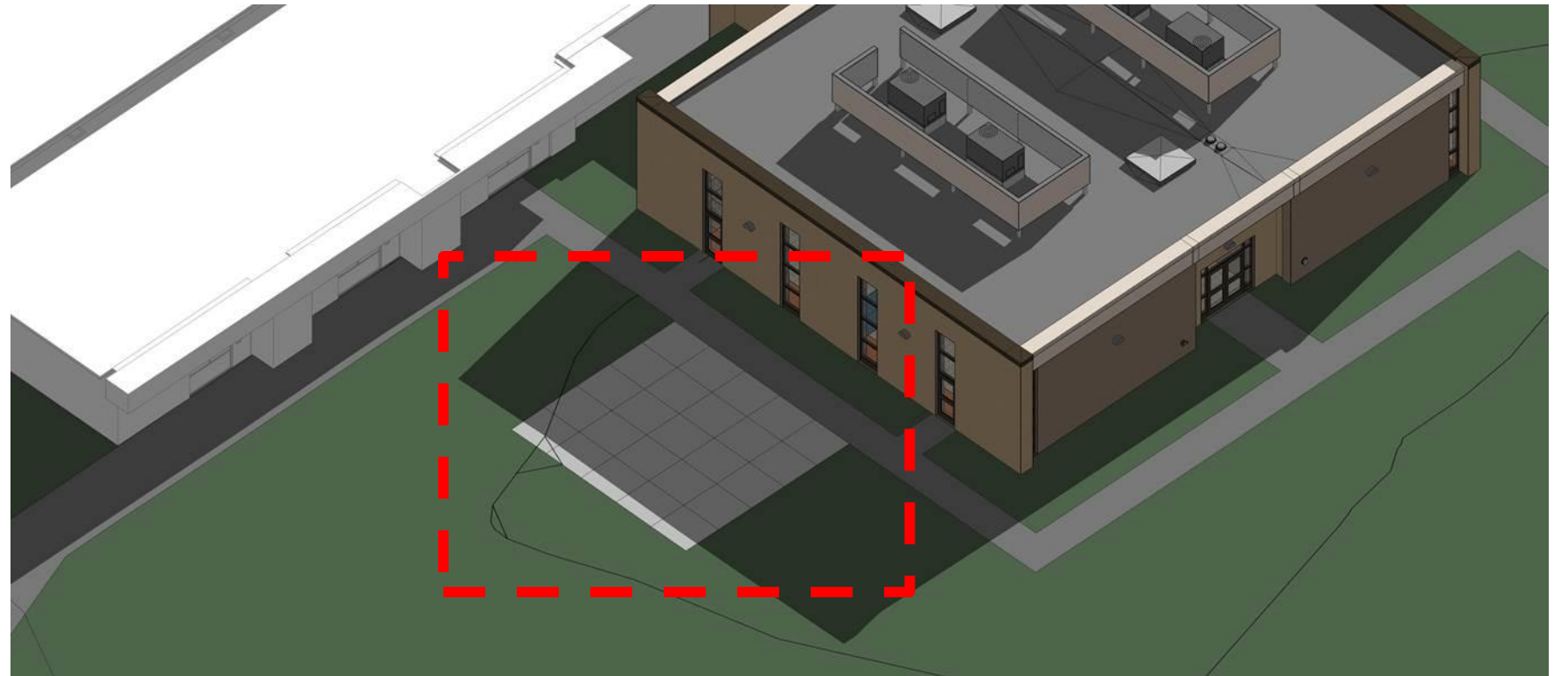


# Outdoor Learning Space – Forest Glen

## CLIMATE

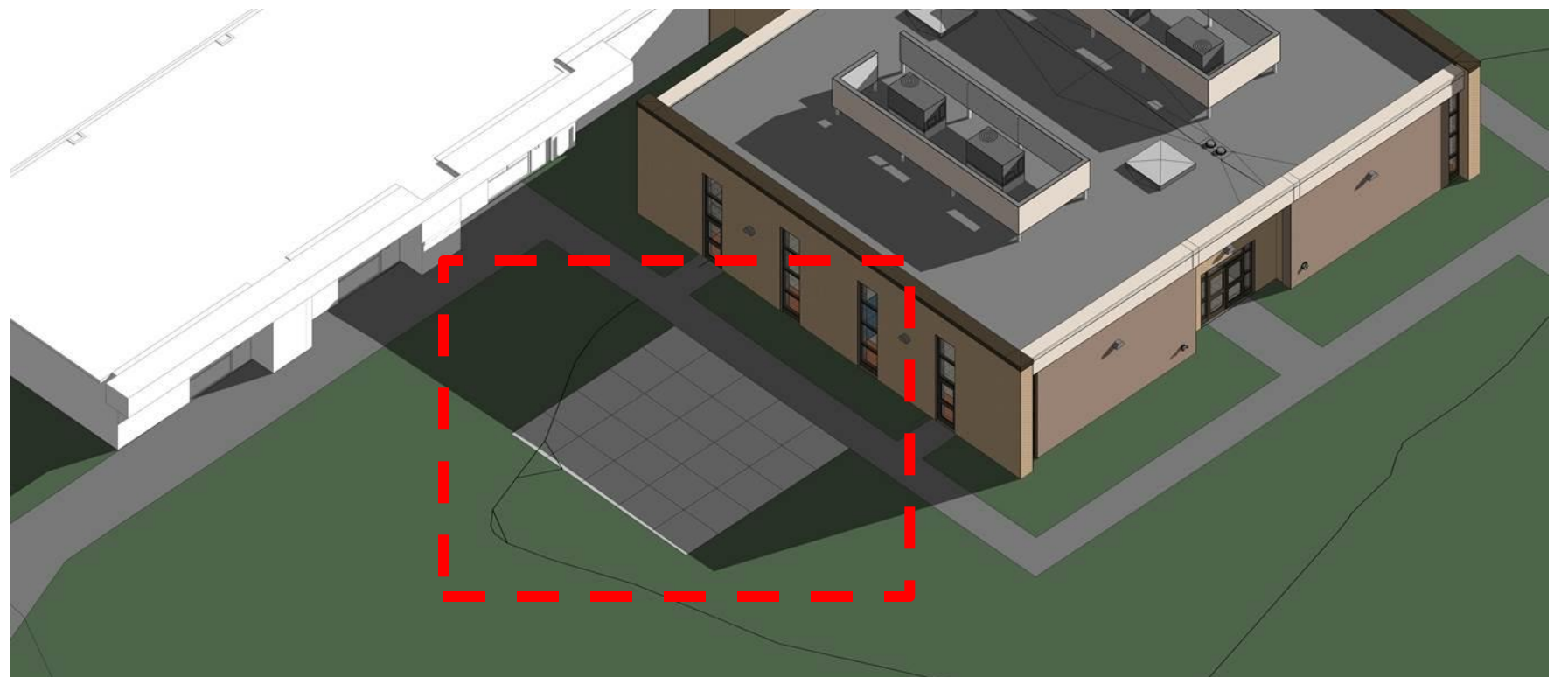
Sun / Shadow

Winter – December at 11:00 am



## SHADOW

Winter – December at 1:00 pm



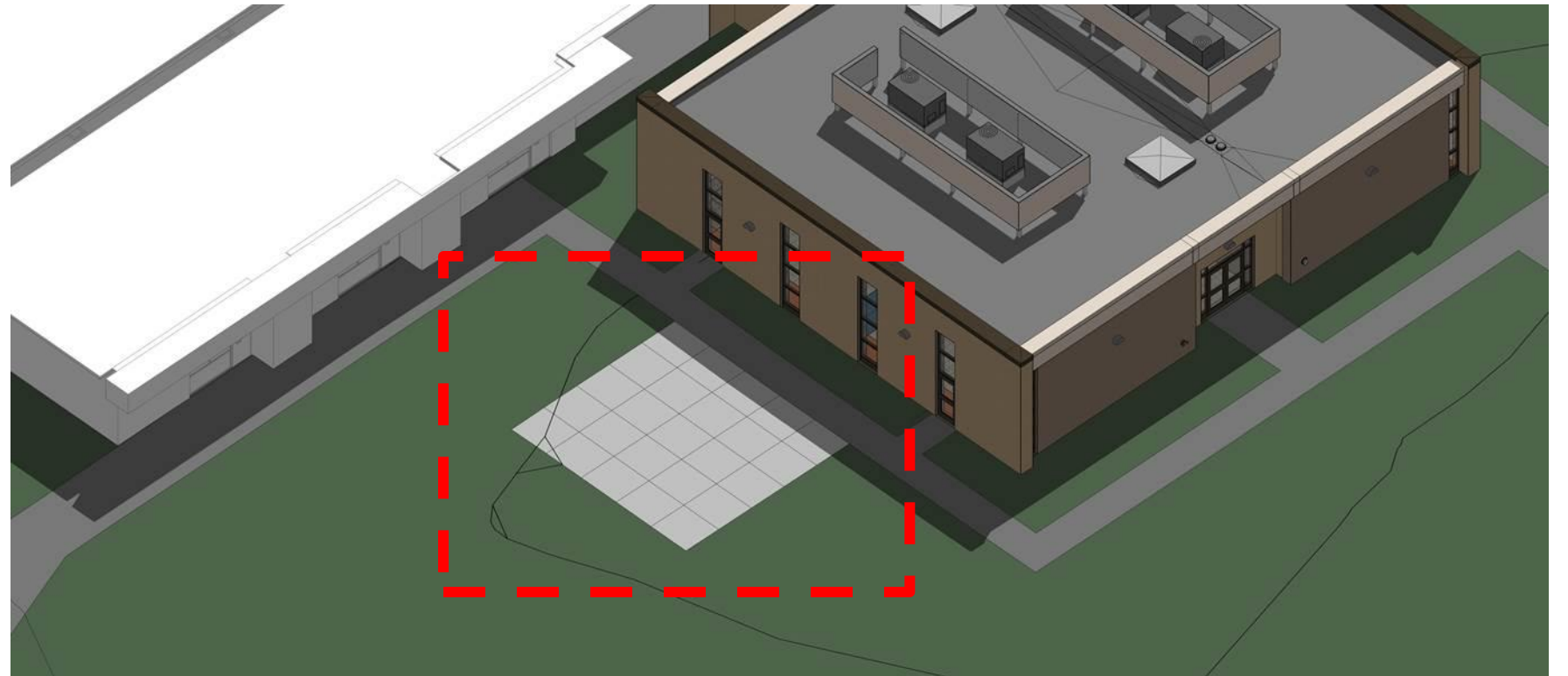


# Outdoor Learning Space – Forest Glen

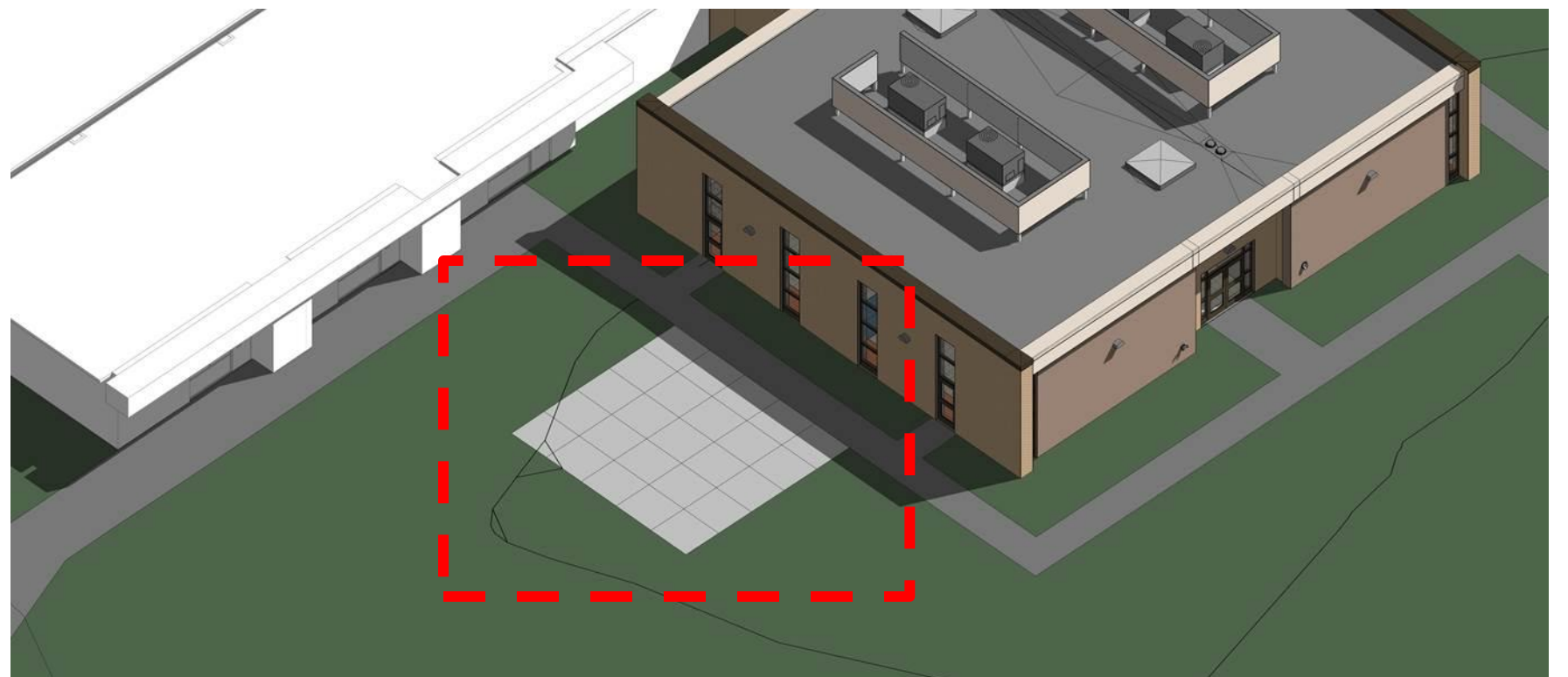
## CLIMATE

Sun / Shadow

Spring – April at 11:00 am



Spring – April at 1:00 pm





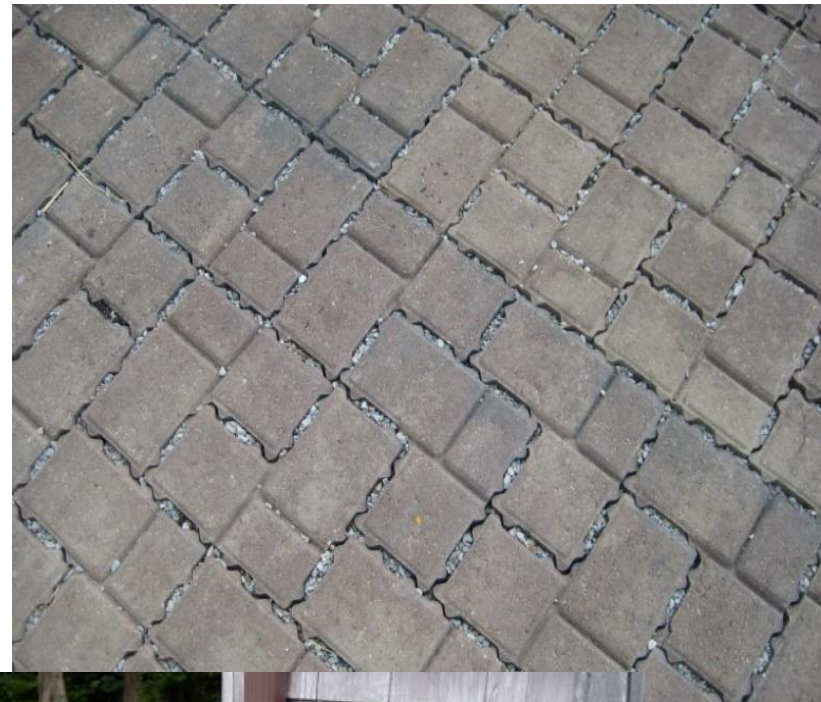
## CLIMATE

Rain / Water

**Where does rain water go?**

### Collect Water

- Prevents flooding
- Use natural resources
- Water plants using collected rain water
- Install pervious pavers, vegetated swales, rain gardens to collect water.



**Permeable Pavers**



**Vegetated Swale**



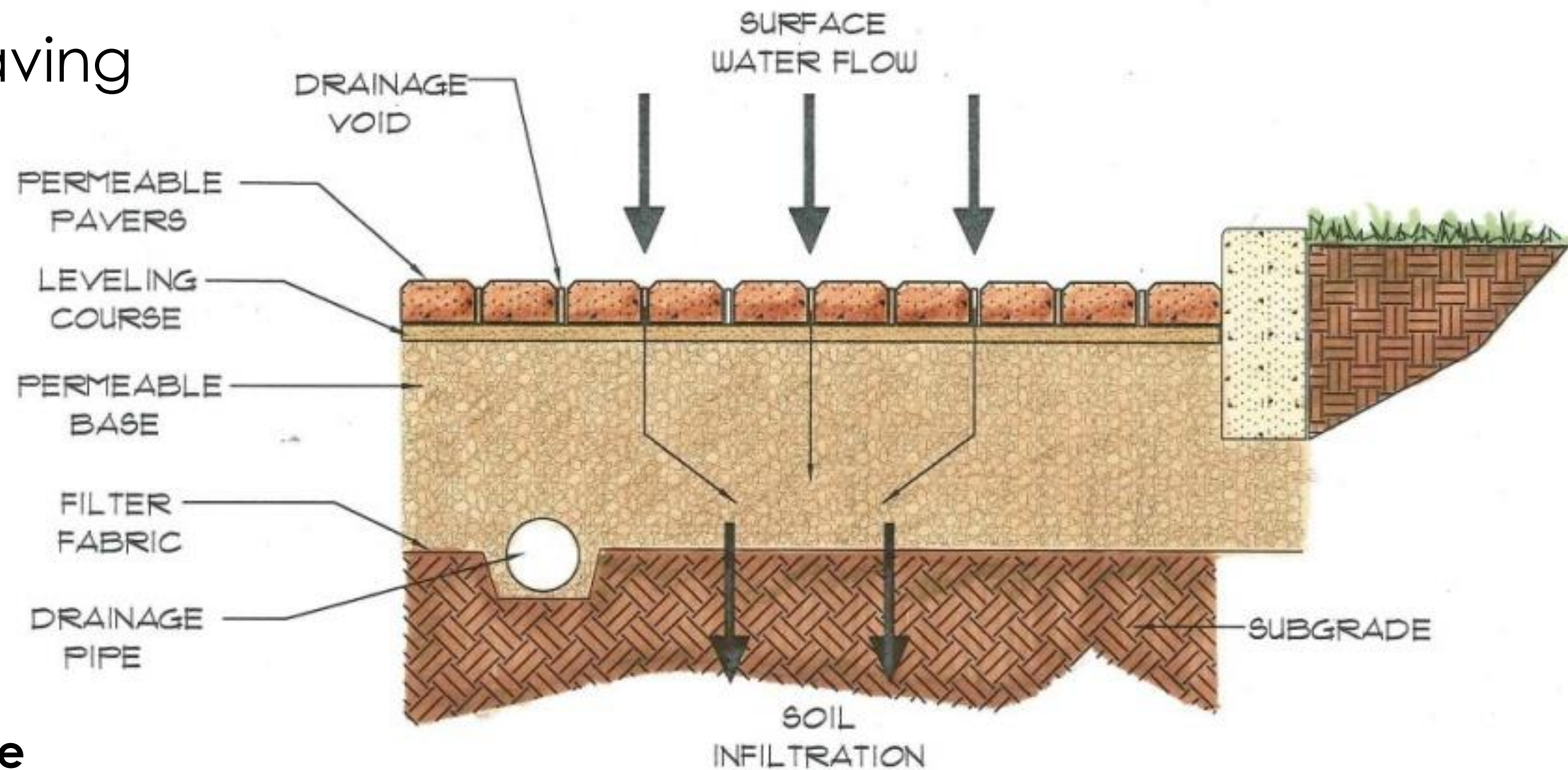
**Water Collection – Rain barrels**



## CLIMATE

### Permeable Paving

### Rain / Water



**What is a permeable paver?**

- ALLOWS SURFACE INFILTRATION
- AGGREGATE MATERIAL FILTERS STORMWATER
- SOIL INFILTRATION CONTRIBUTES TO AQUIFER RECHARGE

Permeable pavers allow surface infiltration, cleansing of storm-water run-off, recharges the aquifer, and reduces the impact of regional storm-water management systems

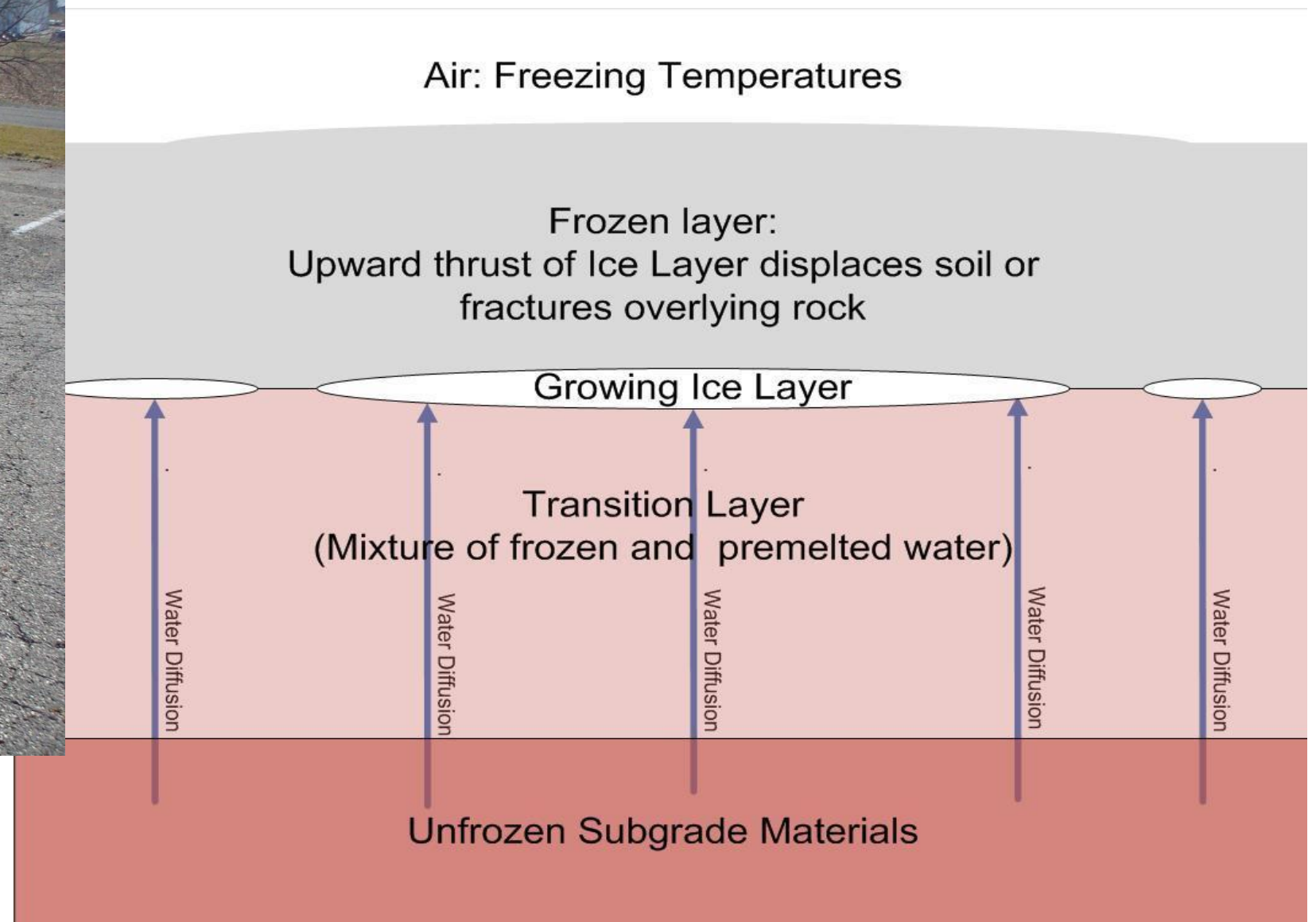


## CLIMATE

### Weather Effects



Pavement Cracking



Freeze / Thaw Cycle



## CLIMATE

### Weather Effects



Erosion



Corrosion / Rust



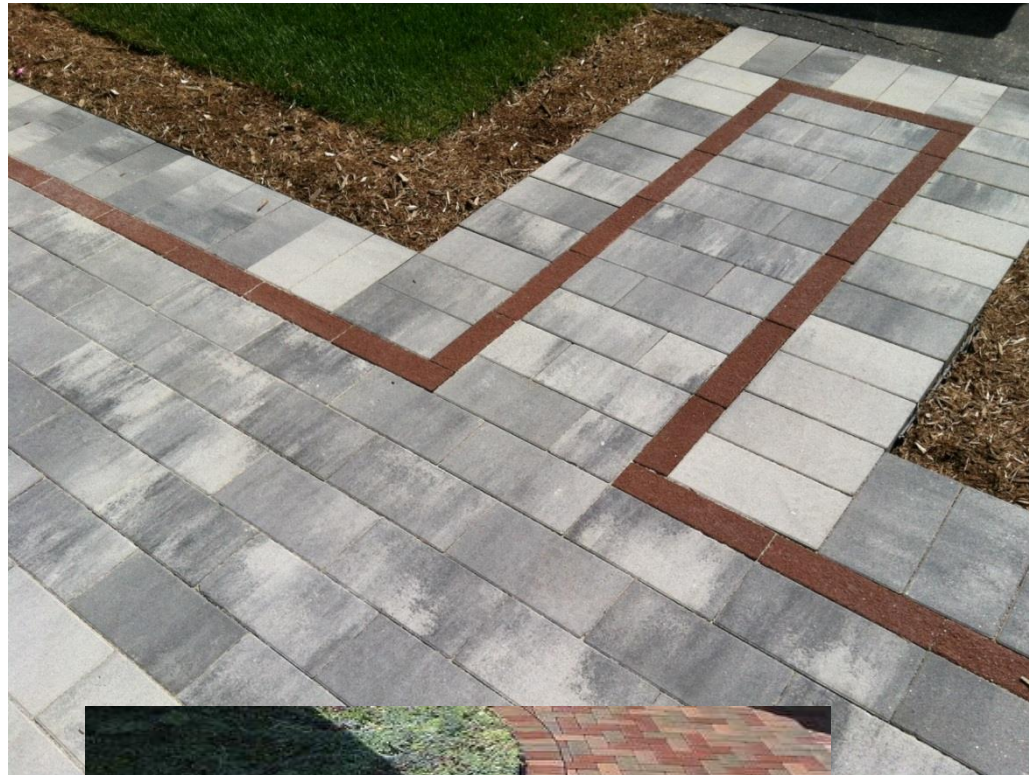
# Outdoor Learning Space – Forest Glen

## PAVING

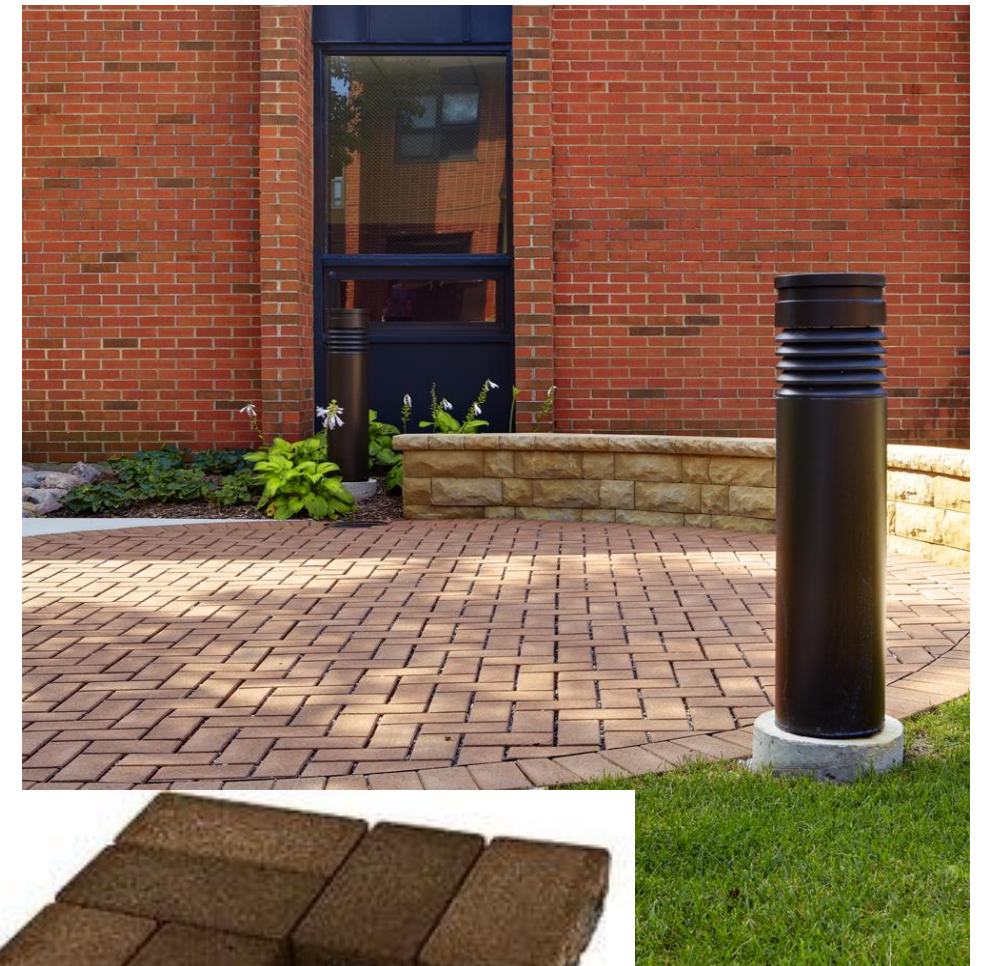
### Types



Concrete - Color /  
Texture / Pattern Variety



Stone Pavers - Color /  
Texture / Pattern Variety



Rubber Pavers - Color /  
Texture / Pattern Variety  
(Hadley Jr. High Courtyard)



## OUTDOOR FURNITURE





## LANDSCAPE

### Types





## LANDSCAPE

### Considerations

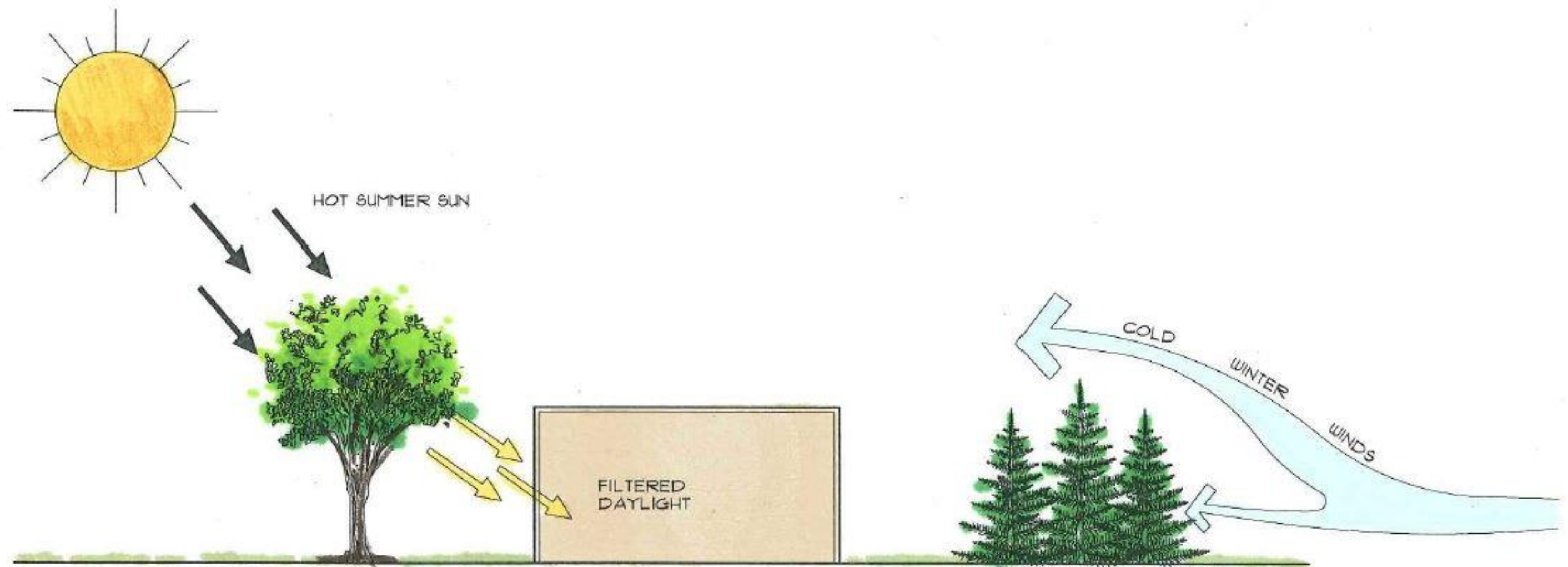


**Has anyone ever been stung by a bee?**



## LANDSCAPE

### Landscape / Tree Placement



SHADE TREES CAN REDUCE WINTER HEATING AND SUMMER COOLING REQUIREMENTS  
EVERGREEN TREES CAN BLOCK AND REDUCE THE VELOCITY OF NORTH WINTER WINDS  
SHADE TREES CAN IMPROVE DAYLIGHT QUALITY BY FILTERING THE LIGHT



## LANDSCAPE



Vertical  
Planting



Water Feature

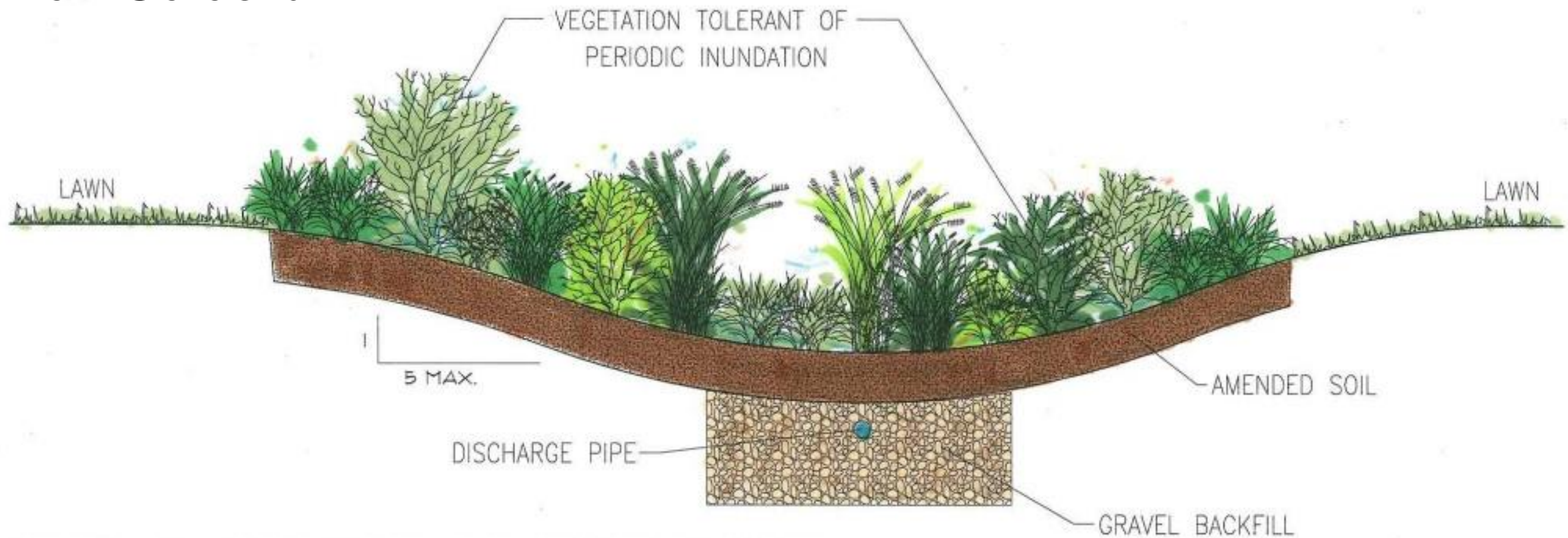


Gardening



## LANDSCAPE

### Rain Gardens

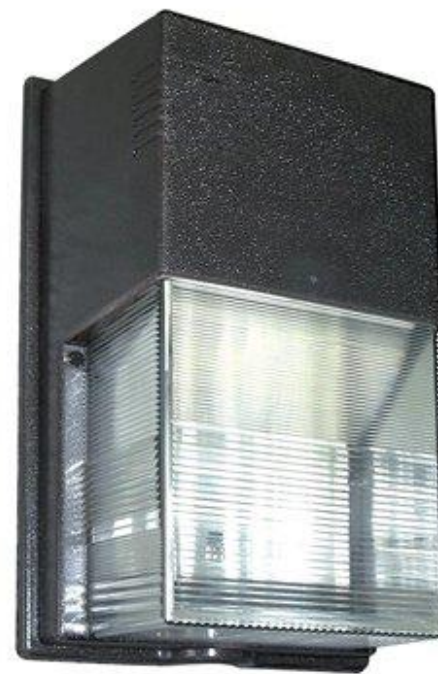


REDUCES RUNOFF VOLUMES AND RATES, WHILE RECHARGING GROUNDWATER  
INCREASED AESTHETIC VALUE OF PROPERTY AND REDUCED MAINTENANCE  
PROVIDES WILDLIFE HABITAT

A landscaped garden designed to percolate and detain storm-water runoff from adjacent surfaces and roof systems.



## LIGHTING





## OUTDOOR LEARNING SPACE EXAMPLES





## OUTDOOR LEARNING SPACE EXAMPLES

### Spatial Features

- What are the needs of the users?
- What will the space be used for?
  - Group Activities?
  - Outdoor learning exercises?

### Community Use

- Both school and neighborhood community use



Hadley Jr. High