

# LEED Sustainable Sites Introduction and Stormwater Discussion



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# Discussion Outline

- LEED Review
- Sustainable Sites Overview
- Sustainable Sites Prerequisites
- SS credit 1: Site Selection
- SS credit 6.1: Stormwater Quantity
- SS credit 6.2: Stormwater Quality

# LEED



Leadership in Energy and  
Environmental Design

- 110 different LEED points
- Certified 40-49 points
- Silver 50-59 points
- Gold 60-69 points
- Platinum 80 points +

# Five LEED Categories

- Sustainable Sites
  - Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality

# Sustainable Sites Overview

- Protecting Surrounding Habitats
  - Managing Stormwater runoff
- Reducing the Heat Island Effect
  - Eliminating Light Pollution

# Sustainable Sites Prerequisites

SS-Prerequisite 1

Construction Activity Pollution Prevention

# SS – Prerequisite 1

- Plan must comply with:
  - Erosion and Sedimentation requirements of the 2003 EPA General Permit OR
  - Local standards (County Conservation District)

Whichever is more stringent

# SS – Prerequisite 1

- Plans must accomplish the following Objectives:
  - Prevent loss of soil during construction
  - Prevent sedimentation of storm sewers or receiving streams
  - Prevent pollution of the air with dust and particulates



**Probably does not comply with LEED Prerequisite**

# SS – Prerequisite 1

## BOTTOM LINE

- Any development in the Delaware Valley will most likely have to comply with this requirement anyway
- LEED compliance causes zero or negligible impact to bottom line

# Sustainable Sites Prerequisites

SS-Prerequisite 2

Schools only:

Environmental Site Assessment

# SS-Prerequisite 2

- Phase 1 Environmental Report
- Routinely prepared by environmental professional
- Follows ASTM guidelines
- Schools on a former landfills are ineligible for LEED certification
- Can help obtain SS Credit 3: Brownfield Redevelopment

# SS – Prerequisite 2

## BOTTOM LINE

- Any school development in the Delaware Valley will most likely have to have this report anyway
- LEED compliance causes negligible impact to bottom line

# Credits:

## Sustainable Sites

- SS 1 Site Selection
- SS 6.1 Stormwater Quantity
- SS 6.2 Stormwater Quality

# SS credit 1

## Site Selection

- Intent: to avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site

# SS credit 1

## Site Selection

- Urban or redevelopment sites more likely to comply with this criteria
- Waterfront properties less likely to comply

# Site Selection Criteria

- Do not develop buildings hardscape, roads or parking areas in portions of sites that meet any of the following criteria:
  - Prime Farmland
  - Previously undeveloped land that is lower than 5' above the 100 year floodplain
  - Land specifically indentified as habitat for any species on federal or state threatened or endangered lists (NJDEP i-MAP)

# Site Selection Criteria

- Do not develop buildings hardscape, roads or parking areas in portions of sites that meet any of the following criteria:
  - Land within 100' of wetlands or within wetlands buffers
  - Previously undeveloped land that is within 50' of a water body
  - Former parkland (unless swap is provided)

# SS credit 1

## BOTTOM LINE

- Property compliant with all criteria may be difficult to find
- LEED compliance may reduce property yield
- Some approvals (NJDEP) may be simpler with LEED compliance

# Stormwater Design



- SS 6.1 Stormwater Quantity
- SS 6.2 Stormwater Quality





## SS - 6.1

# Stormwater Design: Stormwater Quantity

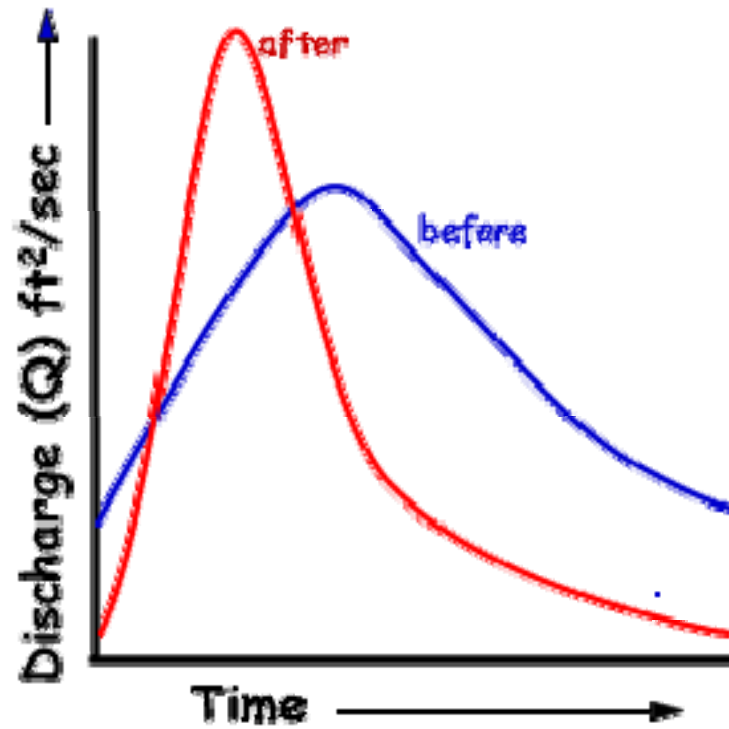
- Option 1: 50% existing impervious coverage or less
  - Reduce peak rates and volumes for the 1 and 2 year storm OR
  - Implement plan that protects receiving stream channels from excessive erosion



## SS - 6.1

# Stormwater Design: Stormwater Quantity

- Option 2 : greater than 50% existing impervious coverage
  - Reduce runoff volume 25% for the 1 and 2 year storm



# Rainfall Graph



## SS credit 6.1 Stormwater Design: Stormwater Quantity

- Methods to comply
  - Plan at the beginning stages of the project
  - Cluster development
  - Water reuse
  - Green roof
  - Infiltration or detention practices



# SS credit 6.1

## Stormwater Quantity

### BOTTOM LINE

- Project may already comply with LEED requirements due to Municipality or NJDEP requirements (especially case 1)
- Stormwater infiltration is often expensive
- May work well with other LEED credits
- Steps to reduce impervious coverage usually reduces project yield



## SS - 6.2

# Stormwater Design: Stormwater Quality

- Requires design that captures and treats 90% of the average annual rainfall
- Treatment must remove 80% of total suspended solids



## SS - 6.2

# Stormwater Design: Stormwater Quality

- Methods to Comply
  - Infiltration basin
  - Rain gardens
  - Bioswales
  - Manhole treatment units



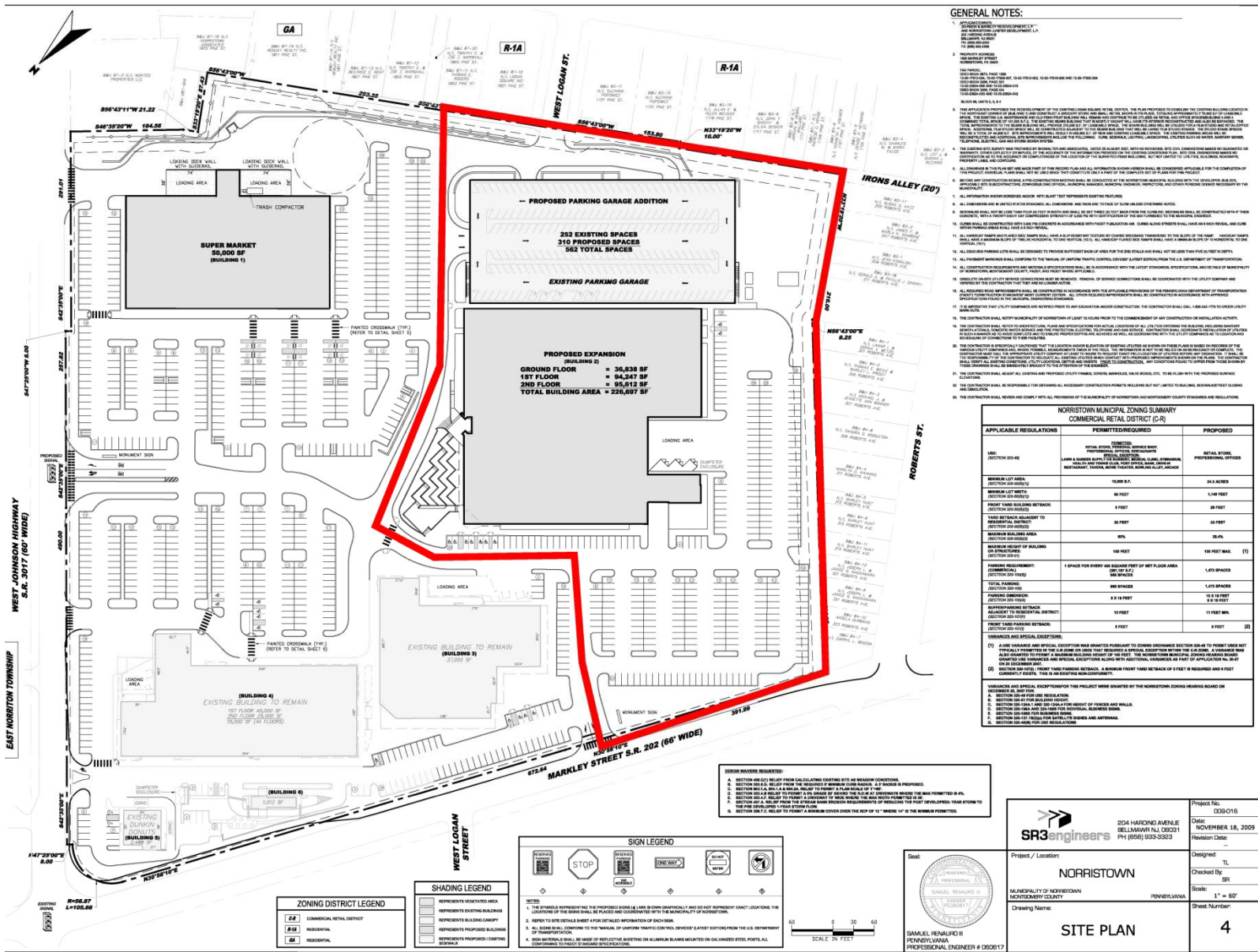
Rain Garden



## SS - 6.2

# Stormwater Design: Stormwater Quality

- Regional Credit available for most of South Jersey
- Site Boundary may vary if site has multiple buildings



**GENERAL NOTES:**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES FOUND DURING THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES AND STRUCTURES FOUND DURING THE CONSTRUCTION OF THIS PROJECT.
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NORRISTOWN MUNICIPAL ZONING SUMMARY COMMERCIAL RETAIL DISTRICT (C-R)		
APPLICABLE REGULATIONS	PERMITTED/REQUIRED	PROPOSED
USE (SECTION 201-06)	RETAIL STORES, PROFESSIONAL OFFICES, SERVICE BUSINESSES, PROFESSIONAL SERVICES, PERSONAL SERVICES, PROFESSIONAL SERVICES, PROFESSIONAL OFFICES	RETAIL STORE, PROFESSIONAL OFFICE
MINIMUM LOT AREA (SECTION 201-07)	10,000 S.F.	24,3 ACRES
FRONT YARD SETBACK (SECTION 201-08)	25 FEET	1,140 FEET
REAR YARD SETBACK (SECTION 201-09)	25 FEET	25 FEET
MINIMUM BUILDING AREA (SECTION 201-10)	500 S.F.	28,000 S.F.
MINIMUM HEIGHT OF BUILDING (SECTION 201-11)	10 FEET	10 FEET MAX. (1)
PARKING REQUIREMENT (SECTION 201-12)	1 SPACE FOR EVERY 100 SQUARE FEET OF NET FLOOR AREA	1,475 SPACES
TOTAL PARKING (SECTION 201-13)	300 SPACES	1,475 SPACES
PARKING OVERHEAD (SECTION 201-14)	3 X 14 FEET	3 X 14 FEET
REAR YARD SETBACK (SECTION 201-15)	10 FEET	11 FEET MIN.
FRONT YARD SETBACK (SECTION 201-16)	5 FEET	5 FEET (2)

**DESIGN REVIEWER REQUIRED:**

1. DESIGN REVIEWER REQUIRED FOR THESE CALLINGS COVERED BY AN ORDINANCE.
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**SIGN LEGEND**

**NOTES:**

1. THE SYMBOLS REPRESENTED BY THE PROPOSED SIGNS ARE SHOWN GRAPHICALLY AND DO NOT REPRESENT EXACT LOCATIONS. THE LOCATION OF THE SIGNS SHALL BE PLACED AND COORDINATED WITH THE MUNICIPALITY OF NORRISTOWN.
2. REFER TO SITE DETAILS SHEET FOR DETAILED INFORMATION ON EACH SIGN.
3. ALL SIGNS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES' LATEST EDITION FROM THE U.S. DEPARTMENT OF TRANSPORTATION.
4. SIGN MATERIALS SHALL BE MADE OF REFLECTIVE MATERIAL ON ALUMINUM BLANKS MOUNTED ON GALVANNEED STEEL POSTS, ALL DIMENSIONS TO MATCH SIGNAGE REGULATIONS.

**ZONING DISTRICT LEGEND**

CR	COMMERCIAL RETAIL DISTRICT
IND	INDUSTRIAL
RES	RESIDENTIAL

**SHADING LEGEND**

[Pattern]	REPRESENTS UNSETTLED AREA
[Pattern]	REPRESENTS EXISTING BUILDING
[Pattern]	REPRESENTS EXISTING DRIVEWAY
[Pattern]	REPRESENTS PROPOSED BUILDING
[Pattern]	REPRESENTS PROPOSED DRIVEWAY

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Project / Location: NORRISTOWN  
MUNICIPALITY OF NORRISTOWN  
MONTGOMERY COUNTY PENNSYLVANIA

Project No: COB016  
Date: NOVEMBER 18, 2009  
Revision Date: -  
Designed: TL  
Checked By: SP  
Scale: 1" = 60'  
Sheet Number: 4

# LEED Site Boundary



## SS - 6.2

# Stormwater Quality

# BOTTOM LINE

- Project may already comply with LEED requirements due to Municipality or NJDEP requirements
- Water quality methods and devices can be expensive

# LEED



## Leadership in Energy and Environmental Design

LEED Reference Guide for Green Building Design and Construction  
2009 edition  
[usgbc.org](http://usgbc.org)