



GREEN INFRASTRUCTURE FOR CAMDEN

December 12, 2011





Localized Flooding in Camden

- October 1, 2010 rain event in Cramer Hill
- Capacity of existing infrastructure & topography
- Sewage water and public health hazard
- Existing conditions/needs vary by neighborhood





The problem... combined sewer systems

DURING DRY WEATHER

Normal sewage flow is contained within the system and flows to the Wastewater Treatment Plant.



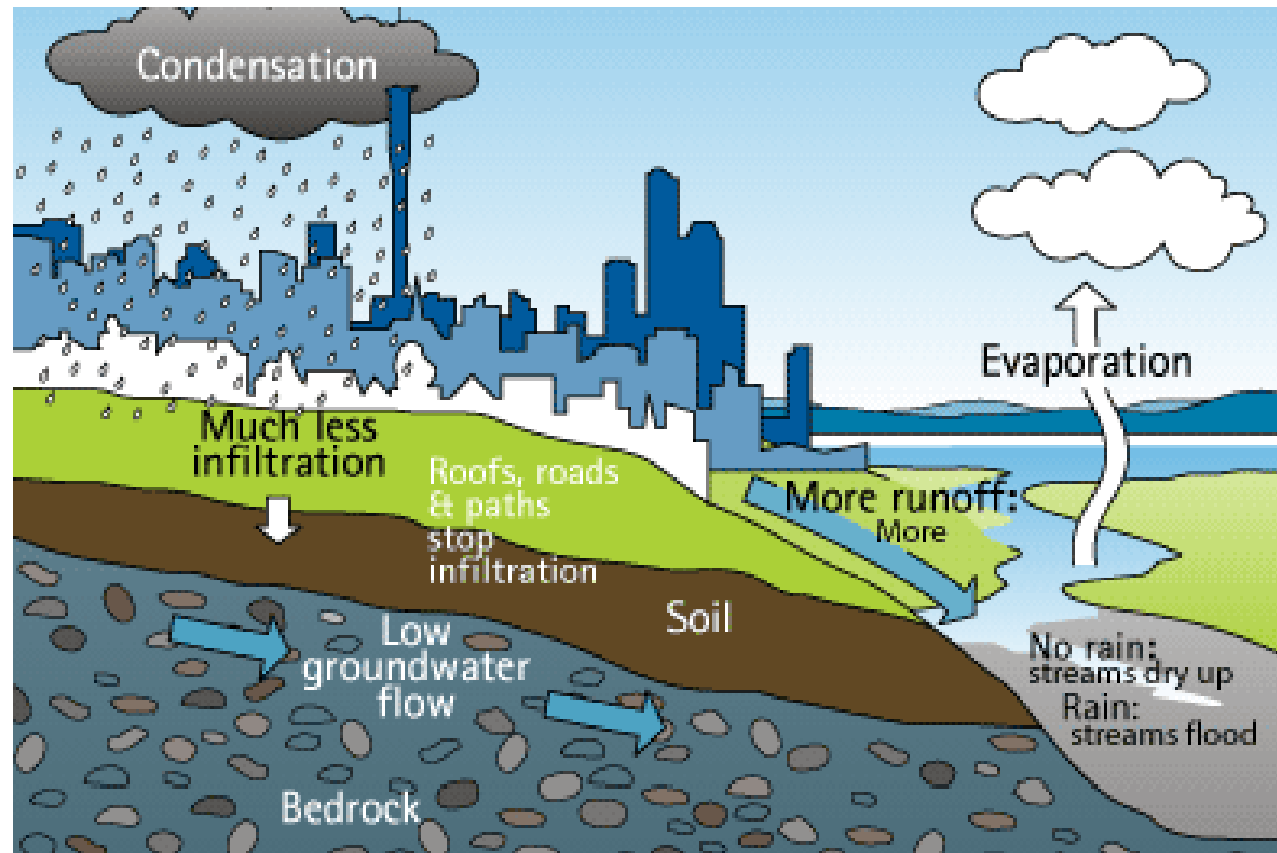
DURING STORMY WEATHER

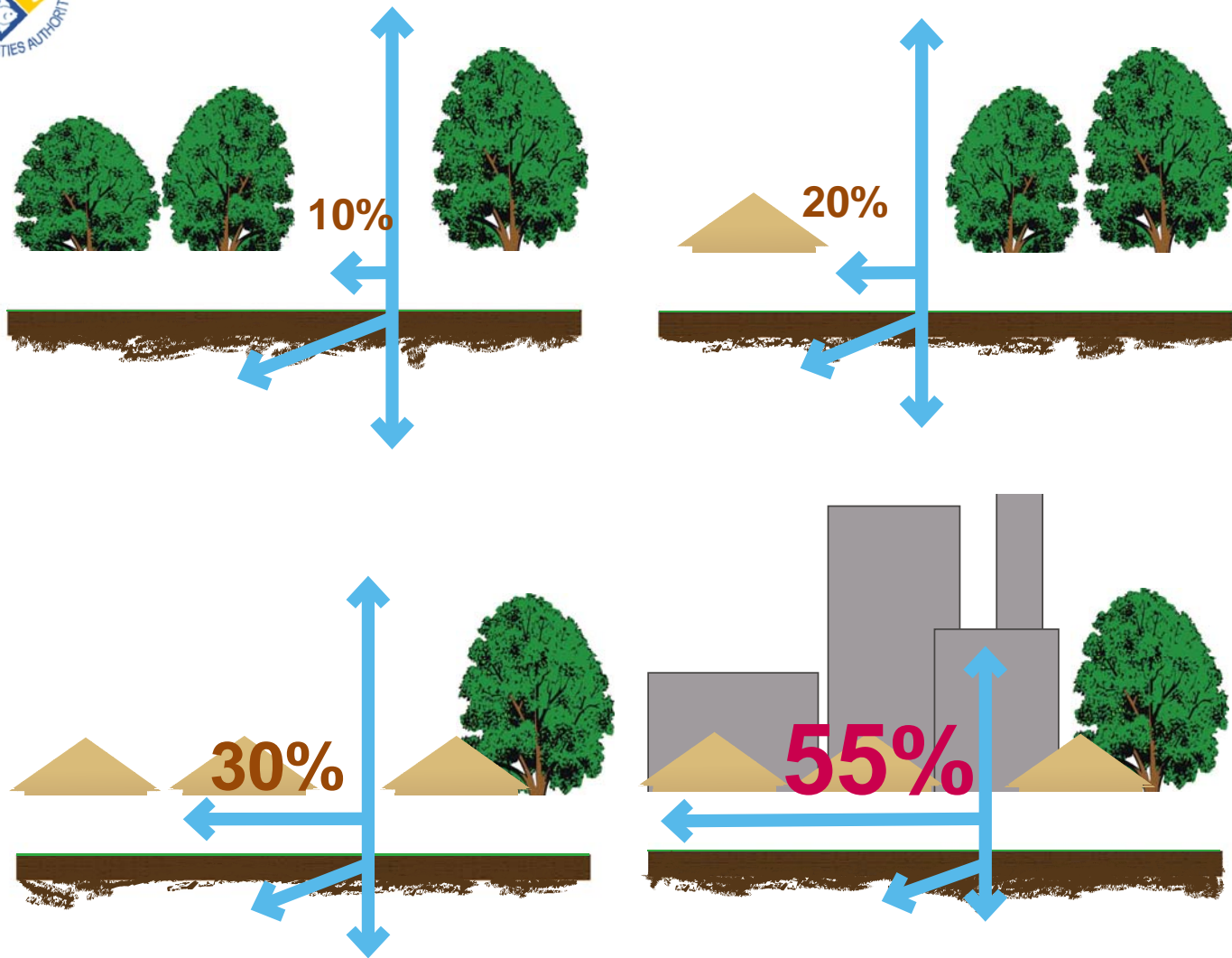
The combination of stormwater and sewage can exceed normal capacity and overflows into area waterways.





The Urban Water Cycle...





more development



more paved surfaces



more stormwater runoff



Grey vs. Green

Grey Infrastructure

- Roads
- Curbs & Gutters
- Catch Basins
- Sewer Pipes
- Retention & Detention Ponds
- Treatment Plants

Green Infrastructure

- Trees
- Wetlands
- Parks
- Gardens
- ...and more!



Green Infrastructure is...

...an approach to stormwater management that is cost-effective, sustainable, and environmentally friendly.

Green Infrastructure projects:

- capture,
- filter,
- absorb, and
- reuse

stormwater to maintain or mimic natural systems and treat runoff as a resource.





Green Infrastructure Includes:

- Green Roofs
- Rainwater Harvesting
- Planter Boxes
- Rain Gardens
- Permeable Pavements
- Vegetated Swales
- Natural Retention Basins
- Trees & Urban Forestry
- Brownfield Redevelopment



Natural Retention Basins



Rain Gardens



Vegetated Swales



Green Roofs



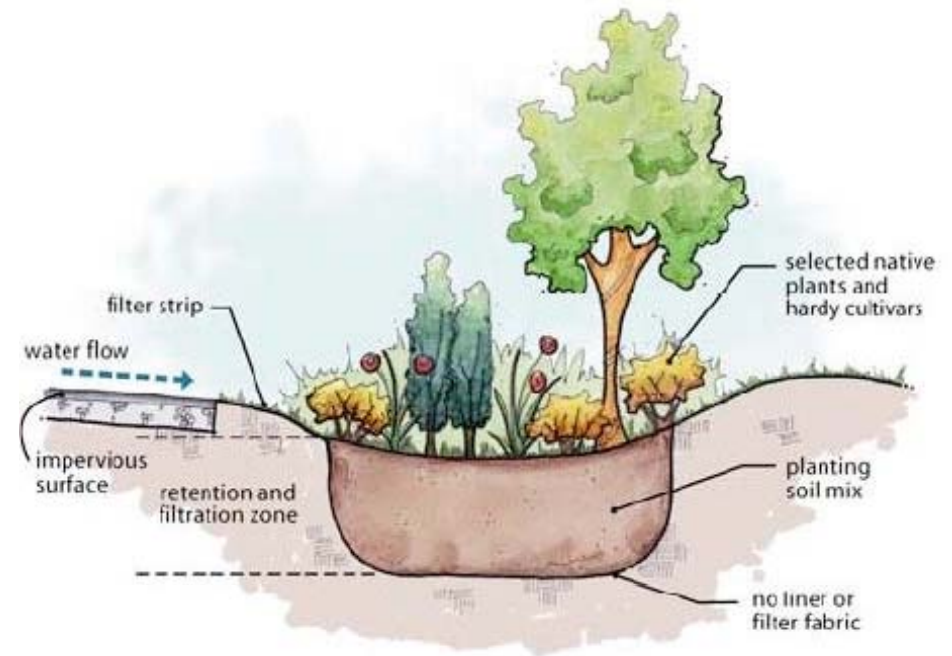
Permeable Pavements



Rainwater Harvesting



Green Infrastructure Techniques Bioswales & Bioretention Basins



- shallow ditches that remove silt and pollution from stormwater runoff
- retain & slow water down
- water quality & aesthetic improvements



Green Infrastructure Techniques

Street Planters & Permeable Pavement



Street Planters:

- Absorb stormwater runoff
- Increase permeable surfaces
- Improve air quality through urban greening

Permeable Pavement:

- Allows movement of water and air through paving material
- Absorbs stormwater runoff



Green Infrastructure Techniques

Community Gardens



- Increases community green space; potential rainwater harvesting
- Addresses fresh food supply issues
- Reduces city heat from streets and parking lots
- Creates income and economic development opportunities



How can green infrastructure projects benefit Camden?

- Reducing localized flooding
- Improving water quality
- Reducing sewer backups
- Preventing combined sewer overflows
- Greening local neighborhoods
- Educating residents





City of Camden
Camden County Municipal Utilities Authority
Cooper's Ferry Development Association
New Jersey Department of Environmental Protection
Rutgers Cooperative Extension
NJ Tree Foundation





What is Camden SMART?



Stormwater Management and Resource Training

Stemwater

Management

And

Resource

Training



What is Camden SMART?



- The objective of the Camden SMART Initiative is to develop a comprehensive network of green infrastructure programs and projects for the City of Camden.
- This Initiative is a collaboration between:
 - City of Camden
 - Camden County Municipal Utilities Authority
 - Cooper’s Ferry Development Association
 - NJ Department of Environmental Protection
 - Rutgers Cooperative Extension Water Resources Program
 - New Jersey Tree Foundation



Coordinating Committee

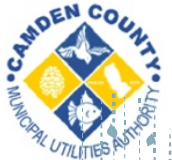
- Andy Kricun – Camden County Municipal Utilities Authority
- Chris Obropta, Jeremiah Bergstrom, Caitrin Higgins – Rutgers Cooperative Extension Water Resources Program
- Frank McLaughlin – NJDEP Office of Brownfields
- Meishka Ruiz – Cooper's Ferry Development Association
- Jessica Franzini – New Jersey Tree Foundation



Stakeholder Group

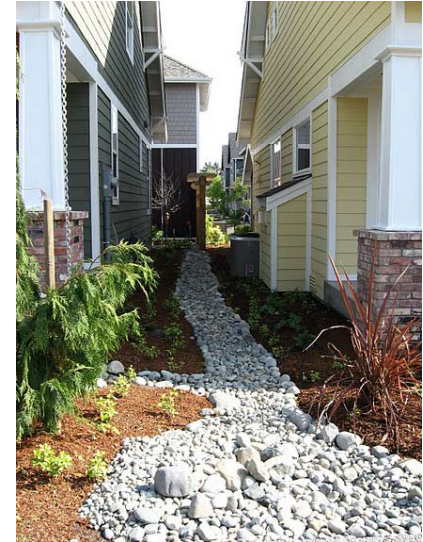
- Rutgers Camden/Walter Rand Institute
- Cramer Hill Community Development Corporation
- Heart of Camden
- Center for Environmental Transformation
- South Jersey Land and Water Trust
- Camden County Soil Conservation District
- Rutgers Cooperative Extension of Camden County
- Camden County 4-H
- Delaware Riverkeeper Network
- Respond, Inc.
- Save Our Waterfront
- Gloucester City Tree Committee & Beautification Association
- NJDEP
- Concerned Citizens of North Camden
- NJ Conservation Foundation
- Camden DCCB
- Camden Community Development Association
- Greater Camden Partnership
- Cooper Lanning Civic Association
- Morgan Village
- Camden City Garden Club
- Holy Name School
- Camden Churches Organized for People
- Concerned Citizens of Whitman Park





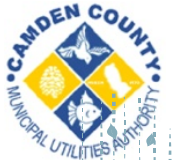
Camden SMART Initiative

Stormwater Management and Resource Training



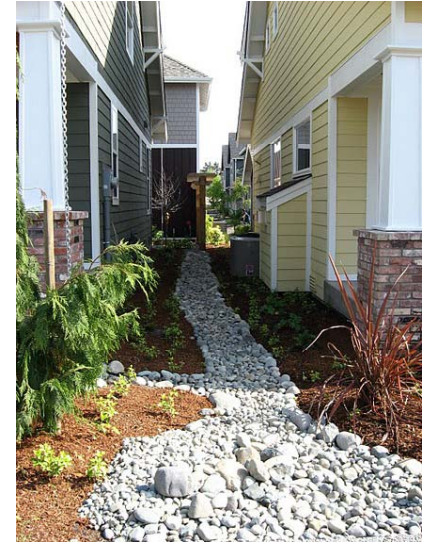
Program Goals:

- 1** Educate residents and community leaders about the benefits of stormwater management and green infrastructure
- 2** Establish a network of community organizations to advocate for sustainability in the City of Camden
- 3** Implement neighborhood green & grey infrastructure projects to alleviate flooding and achieve sustainable neighborhood revitalization
- 4** Provide training on green infrastructure techniques and create skilled jobs for residents



Camden SMART Initiative

Stormwater Management and Resource Training



Program Benefits:

- Prevention of neighborhood flooding and combined sewer overflows
- Job creation
- Improvements in air, water and climate quality
- Additional recreational amenities and open space
- Neighborhood beautification
- Environmental policy development

OVERVIEW



The Camden County Municipal Utilities Authority (CCMUA) in partnership with the Rutgers Cooperative Extension Water Resources Program proposes to pilot a community-based initiative implementing green infrastructure projects throughout the City of Camden and Gloucester City to reduce impacts to waterways and neighborhoods from combined sewer overflows, flooding, and sewer backups into private properties. The initial target will be to implement pilot rain garden and green infrastructure projects to prevent one (1) million gallons of stormwater from reaching the combined sewers in the City of Camden and Gloucester City. The program will include:

- Educating community leaders, businesses, and residents on the benefits and opportunities for green infrastructure projects;
- Providing training to local contractors and residents on green infrastructure installation techniques; and
- Establishing a network of community-based organizations to provide capacity for continual growth and expansion of the program.

Rain Garden Installation
Summer Elementary School
Camden, NJ
June 21, 2010





Tasks

1. Conduct City-Wide Feasibility Studies
 - City of Camden
 - Gloucester City
2. Community Meetings and Presentations
 - 4 Neighborhood workshops in City of Camden
 - 1 City-wide workshop in Gloucester City
3. Conduct Training Sessions
 - Rain Garden Training for Professional Landscapers (2/17/11)
 - Rain Garden Training for Homeowners and Officials
4. Design & Develop Demonstration Projects
 - Conduct neighborhood tours & site visits
5. Establish Community-Based Implementation Network
6. Identify and secure funding for next steps



Key Accomplishments

- Prepared Green Gateway design plans for rain garden park on formal Brownfields site
- Prepared and currently constructing Ferry Ave rain garden
- Created Campbell's Soup rain barrels
- Completed preliminary GIS mapping of 20 Camden neighborhoods and Gloucester City
- Conducted site visits and tour to identify rain garden rainwater harvesting for community gardens
- Facilitated 2 Stakeholder Group Meetings
- Facilitated a series of 5 community meetings
- Received preliminary commitment from NJDEP 319h program to provide \$300,000 to fund implementation projects
- Conducted Rain Garden Training Program
- Established the Camden SMART Collaboration



Next Steps

- Conduct Community Meetings (February – March)
- Complete Neighborhood Site Visits & Identify Priority Demonstration Projects
- Conduct 1st Training Session and install 1-2 Demonstration Rain Garden Projects
- Schedule 2nd Training Session
- Revise 319h Grant Proposal and Secure Implementation Funding (funding anticipated to be available in July-August 2011)
- Prepare Draft Feasibility Studies (Camden + Gloucester)
- Plan for next Stakeholder Meeting in late-April or early-May



Green Infrastructure Demonstration Projects



Rain Garden Installation
Sumner Elementary
School
June 21, 2010

- targeting area neighborhoods that suffer from flooding and other environmental issues alleviated by green infrastructure
- establishing neighborhood partnerships
- training for residents and contractors on installation and maintenance of green infrastructure

SUMNER ELEMENTARY SCHOOL

Rain Garden



Sumner Elementary School
1600 South 8th St
Camden, NJ

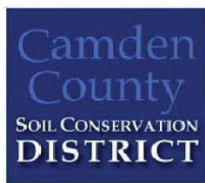
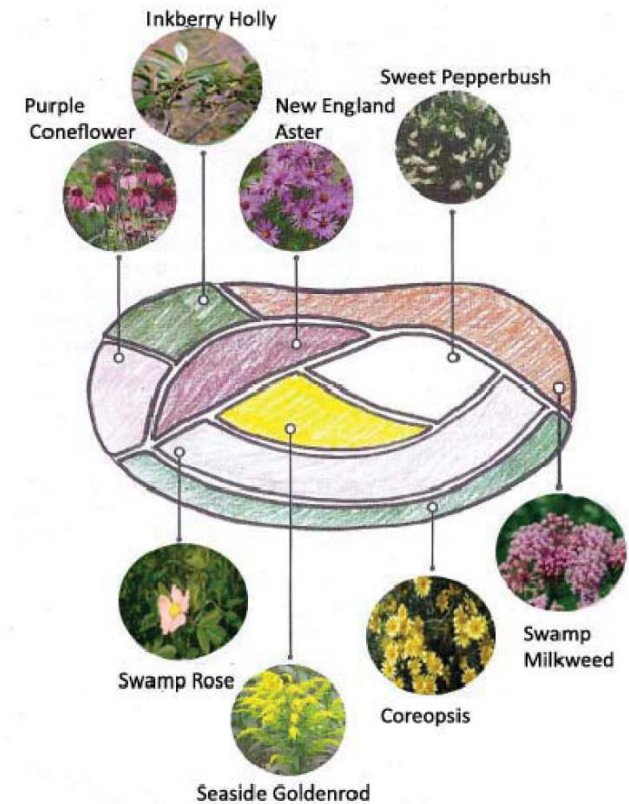
Plant List

- Purple Coneflower (*Echinacea purpurea*)
- Inkberry Holly (*Ilex glabra*)
- New England Aster (*Aster novae-angliae*)
- Sweet Pepperbush (*Clethra alnifolia*)
- Swamp Rose (*Rosa palustris*)
- Seaside Goldenrod (*Solidago sempervirens*)
- Coreopsis (*Coreopsis lanceolata*)
- Swamp Milkweed (*Asclepias incarnata*)

Rain Garden Design

- 250 square feet
- 6 inches deep
- 12 inches of soil excavated
- 3 inches of topsoil/compost added to amend existing soils
- 3 inches of mulch spread
- Collects rooftop runoff from the downspout located at the corner of the building.

Rain Garden Layout

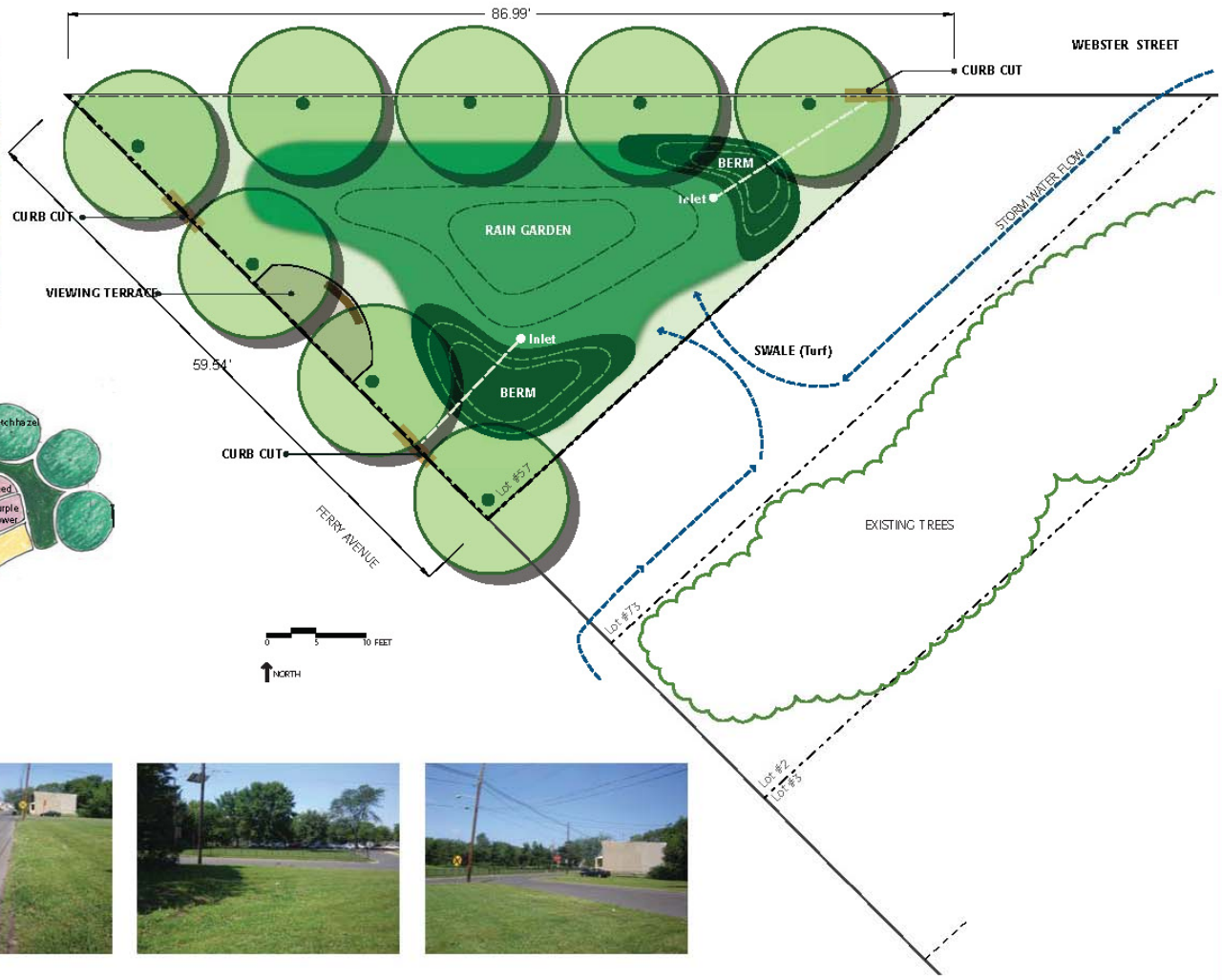


CCMUA FERRY AVENUE

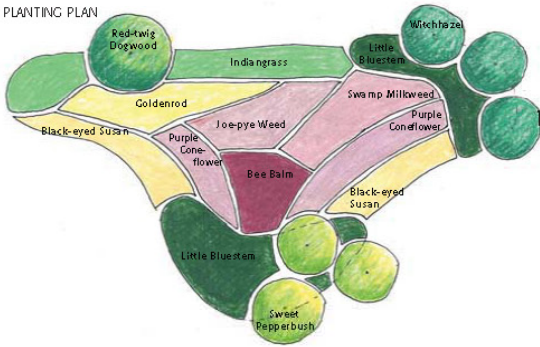
Conceptual Site Plan

This rain garden will be constructed to capture and treat runoff from surrounding roadways to reduce nuisance street flooding in this low-lying neighborhood and protect water quality of the nearby waterways.

SITE CONTEXT



RAIN GARDEN PLANTING PLAN



EXISTING SITE CONDITIONS



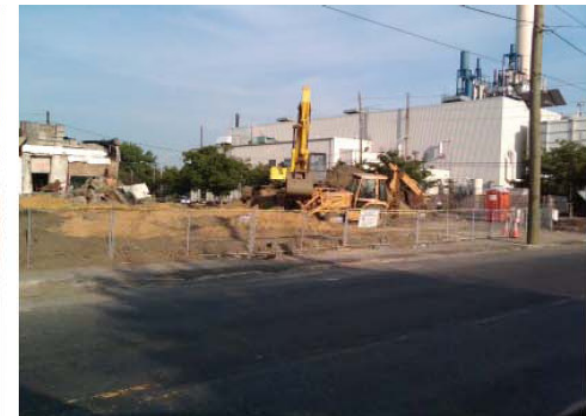
CAMDEN GREEN GATEWAY PROJECT

Project Overview

The RCE Water Resources Program has partnered with the CCMUA to develop a community-based open space plan for the former fueling station located at the corner of Broadway and Chelton Avenue. The CCMUA is leading an effort with support from NJDEP to remediate this corner property and provide a "Green Gateway Entry" to the community of Waterfront South. The RCE Water Resources Program is preparing the conceptual design plan outlining recommended improvements for the property to serve as an open space amenity to the local community. This "Green Solution" will integrate rain gardens into the site to reduce stormwater discharges to the combined sewer system and protect water quality. The rain gardens will be constructed with support from local residents to serve as a demonstration for other neighborhoods throughout Camden on how cost-effective green infrastructure solutions can be integrated into parks and open spaces as well as reclaimed vacant and abandoned properties once demolition, debris removal, and clean up is completed. Including green infrastructure techniques and technologies as part of redevelopment programs in New Jersey's urban communities provide multiple environmental benefits and can help local communities realize the potential of underutilized sites making them a true community amenity and resource for local residents.



Chelton Avenue Existing Conditions
April 22, 2010



Chelton Avenue Construction Progress
June 21, 2010

THE GREEN GATEWAY CHELTON AVENUE

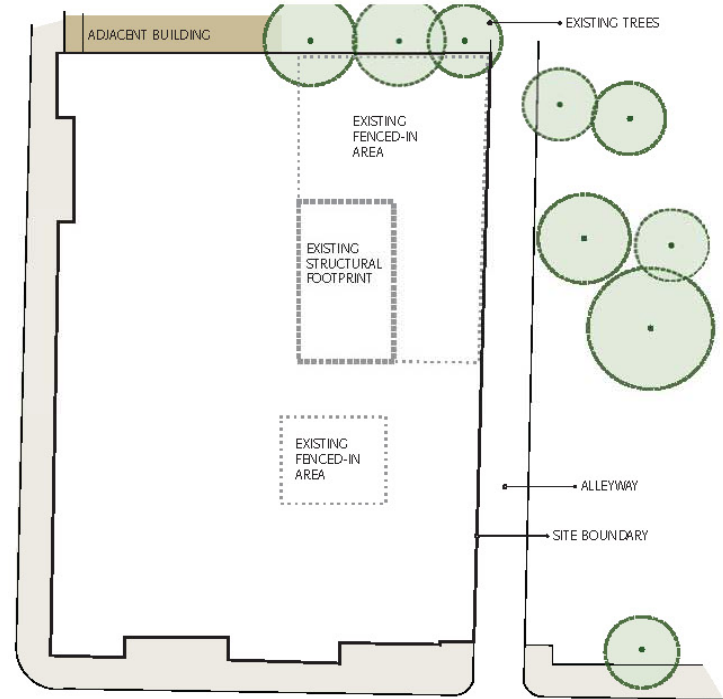
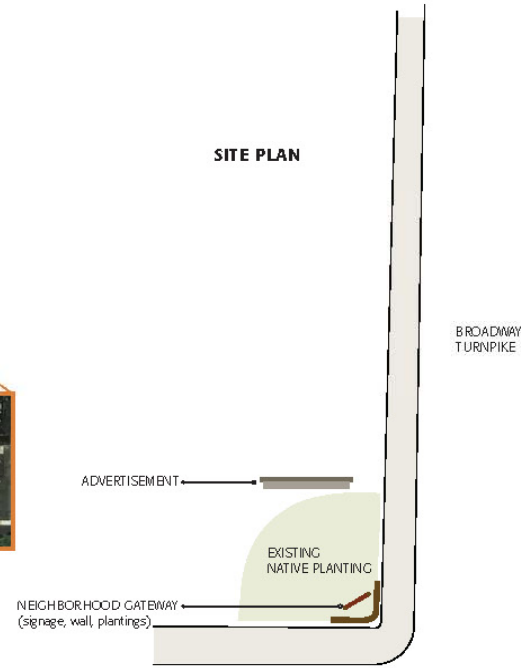
Existing Site Conditions

SITE CONTEXT



SITE BOUNDARY

SITE PLAN



TYPICAL RAIN GARDEN FOOTPRINTS



SITE PHOTOGRAPHS



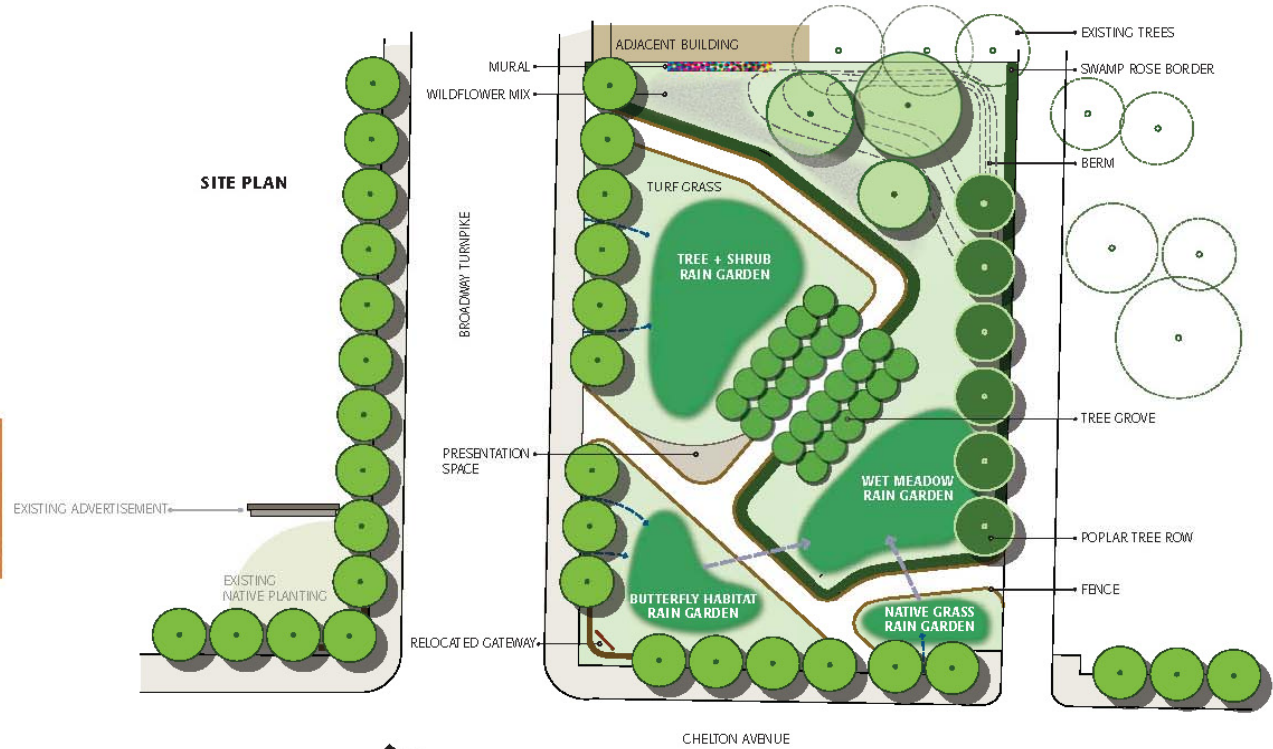
THE GREEN GATEWAY CHELTON AVENUE

Proposed Site Plan

SITE CONTEXT



SITE PLAN



SWAMP ROSE



BUTTERFLY HABITAT RAIN GARDEN



ART MURAL



FENCE





- Partnership between Camden and Philadelphia through Two Cities, One Waterfront Initiative
- Long range vision for stormwater and resource management for City of Camden

