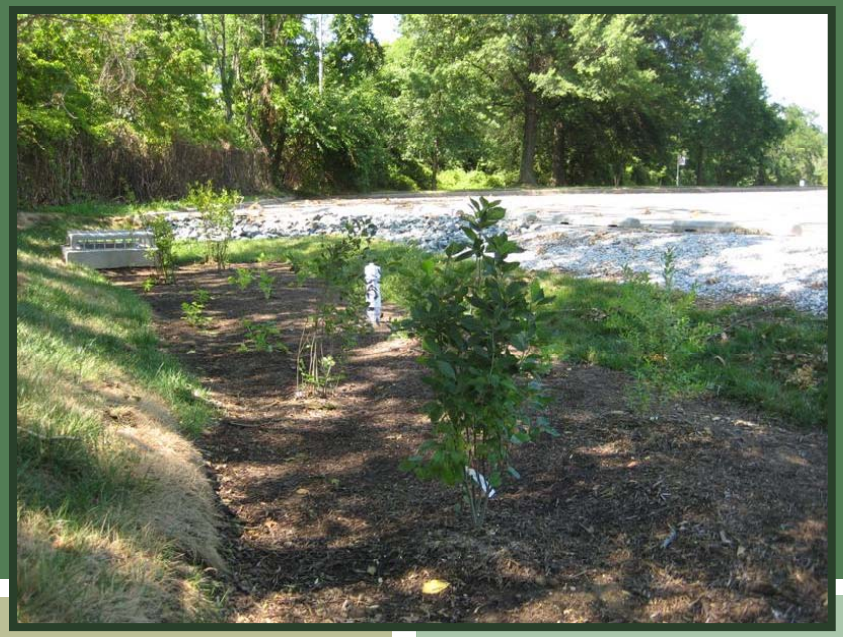
Practical Stormwater Solutions for Maryland Local Municipal Governments
March 2013 Symposium

Baltimore Polytechnic Institute
Parking Lot Bioretention Retrofit:
A Practical Stormwater Management Solution



MARYLAND ENVIRONMENTAL SERVICE

moffatt & nichol

MPA Schoolyard Greening Program

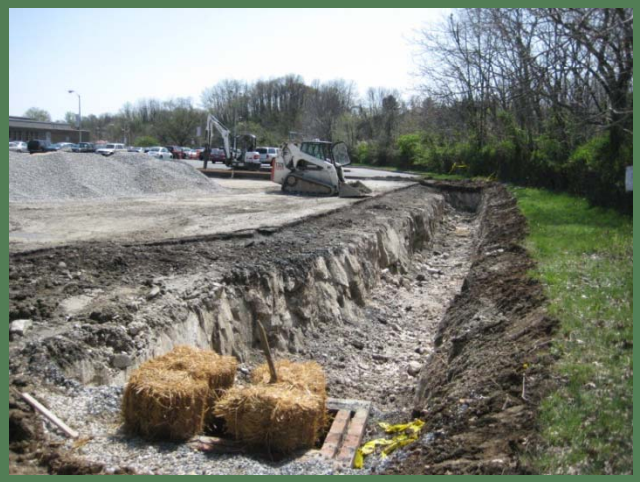
- Innovative partnership program between Maryland Port Administration (MPA) and Baltimore City Schools
- Projects provide long-term environmental and educational benefits to schools while offsetting environmental impacts from MPA projects
- Existing asphalt areas replaced with new green spaces
- Water quality benefits by reducing or treating impervious surfaces
- Enhanced schoolyard areas provide opportunities for recreation, exercise, environmental education and outdoor learning
- The Maryland Environmental Service (MES) supports MPA's program working as the prime contractor, performing construction, and subcontracting permitting and design services to Moffatt & Nichol.

Constructed Schoolyard Greenings

- MES was contracted by MPA in 2008 to assist in implementing the program with cost-effective environmental solutions. All work was completed under budget, including additional work.
- 2008: Barclay School – MES restored the new 0.75 acre green space.
- 2009: Matthew Henson Elementary and Baltimore Montessori Public Charter Schools – MES removed and recycled 1.5 acres of impervious surface and replaced with soil, sod, and a bioretention facility. Total approximate construction cost: $260,000.
- 2010: Hamilton Elementary School – MES re-graded and installed ~1 acre of new sod. Total approximate construction cost: $23,000.

Baltimore Polytechnic Institute Parking Lot Stormwater Retrofit

- Constructed in 2012
- Two adjacent micro-bioretention facilities
- 2,750 SF footprint to filter runoff from 1 acre of impervious area
- Net loss of only 7 parking spaces
- Provided groundwater recharge
- Design included retrofit of existing inlet structures to serve as overflow weirs to save construction costs
- Direct environmental benefit to the Jones Falls, a 303(d) impaired stream
- Total Approximate Construction Cost of $115,000



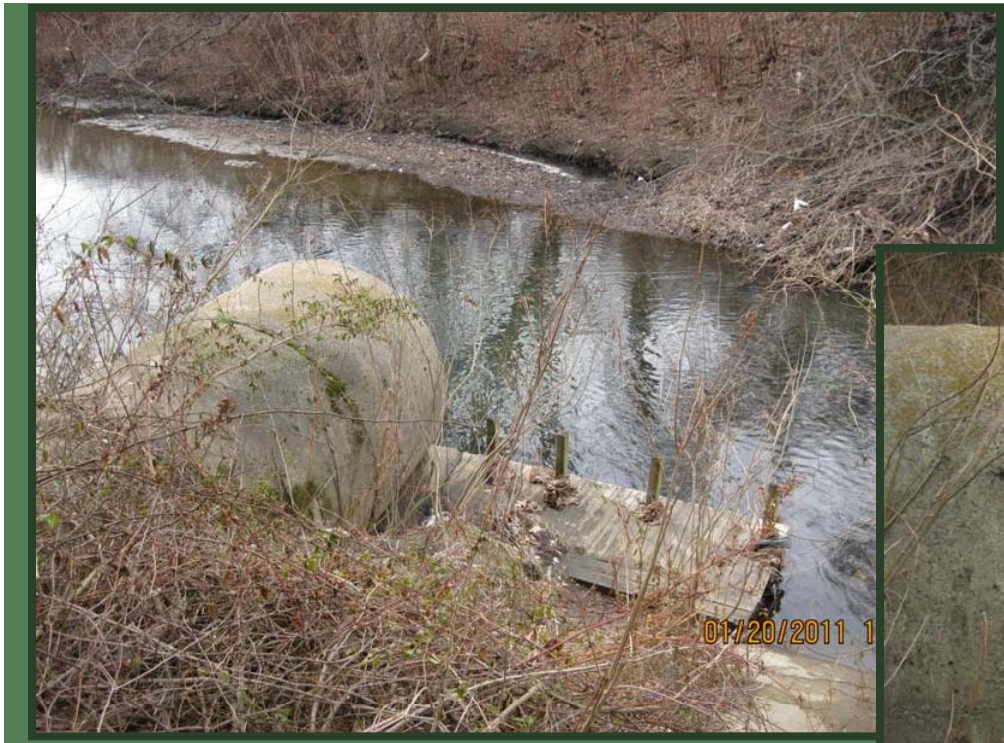
Bioretention:
Practical and Effective Solution

- Environmental Site Design (ESD) stormwater filtering practice
- Site integrated and low maintenance
- Captures runoff from hard surfaces and filters out pollutants before flowing downstream
- Uses natural filter media (soil, sand, mulch, plants)
- Provides aesthetic micro-habitats for native birds and insects
- Promotes infiltration and groundwater recharge
- Reduces downstream erosion of stream banks and wetlands
- Provides practical educational opportunities for classroom integration on impacts of stormwater runoff and urban water quality issues

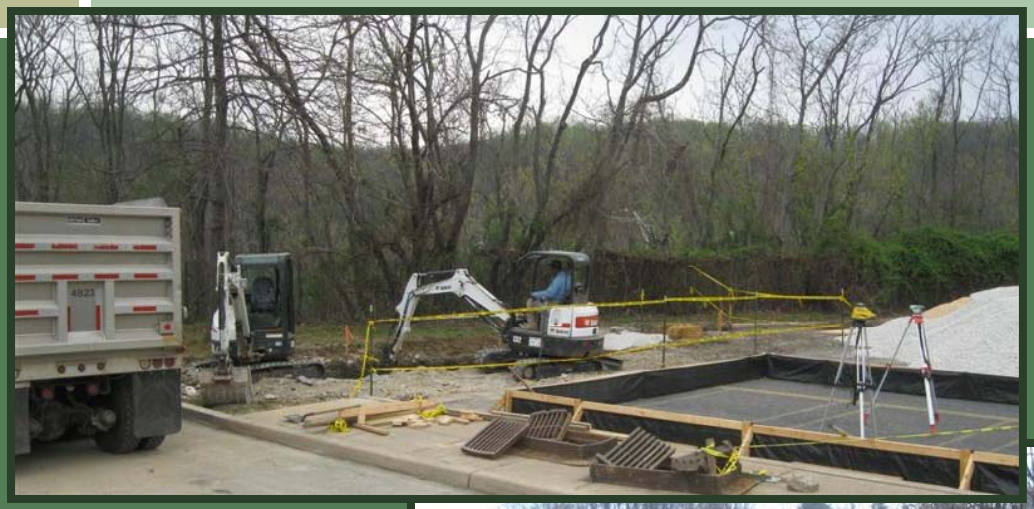
Polytechnic: A Project of Partnerships

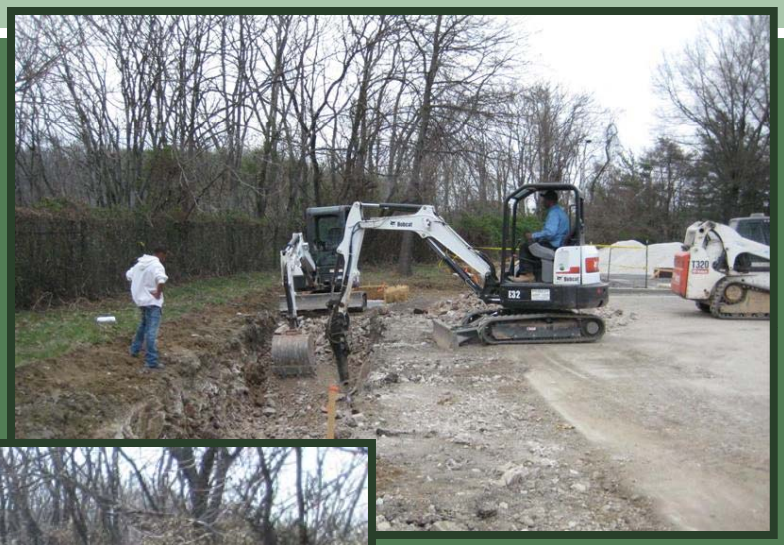
- DESIGN
  - MES and Moffatt & Nichol coordinated design process with Polytechnic science and engineering students
- CONSTRUCTION
  - Polytechnic students took part in site surveying and observed construction process
  - MES utilized construction support from Chesapeake Center for Youth Development, an organization that provides work opportunities for at risk urban youth to help them develop job skills through on-the-job training.
- MAINTENCE/MONITORING
  - Blue Water Baltimore watershed organization has been contracted by MPA to engage students in continuing inspections, maintenance, outreach and stewardship activities
- Project provides improved water quality, enhanced environmental habitat, education, and long-term benefit to the school community

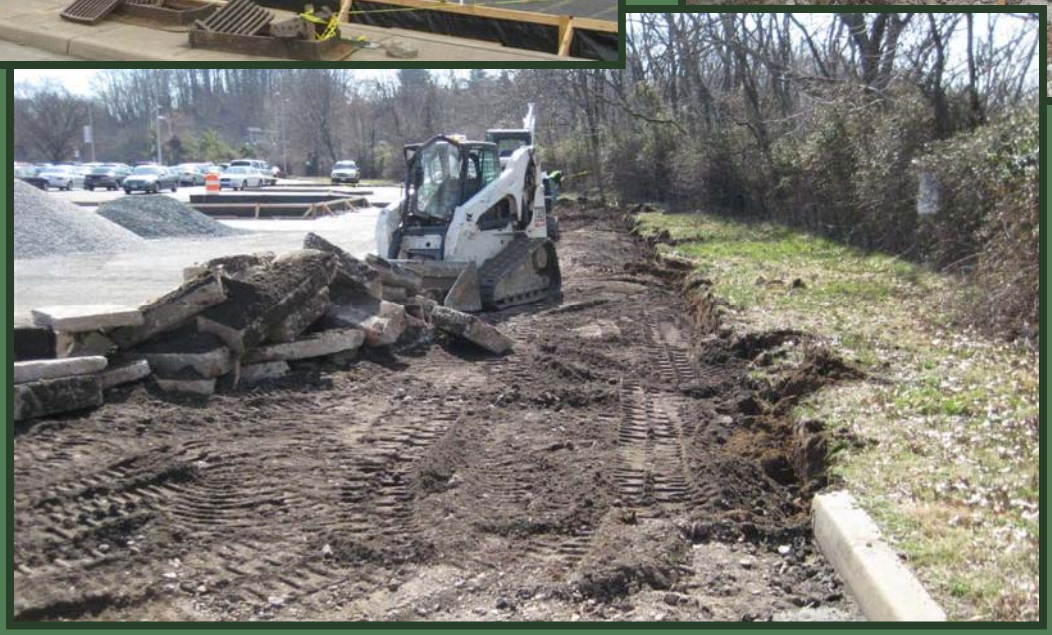
Storm Drain System
Outfall into Jones Falls



Schoolyard Greening Construction







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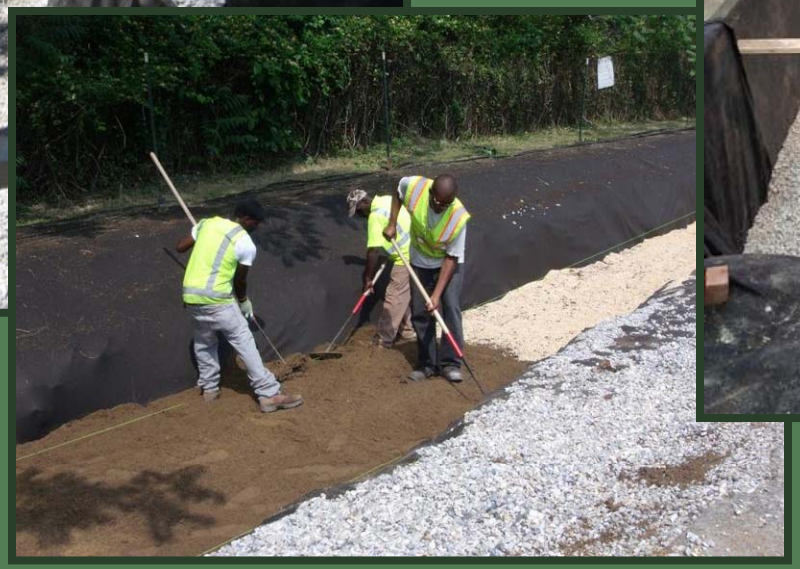
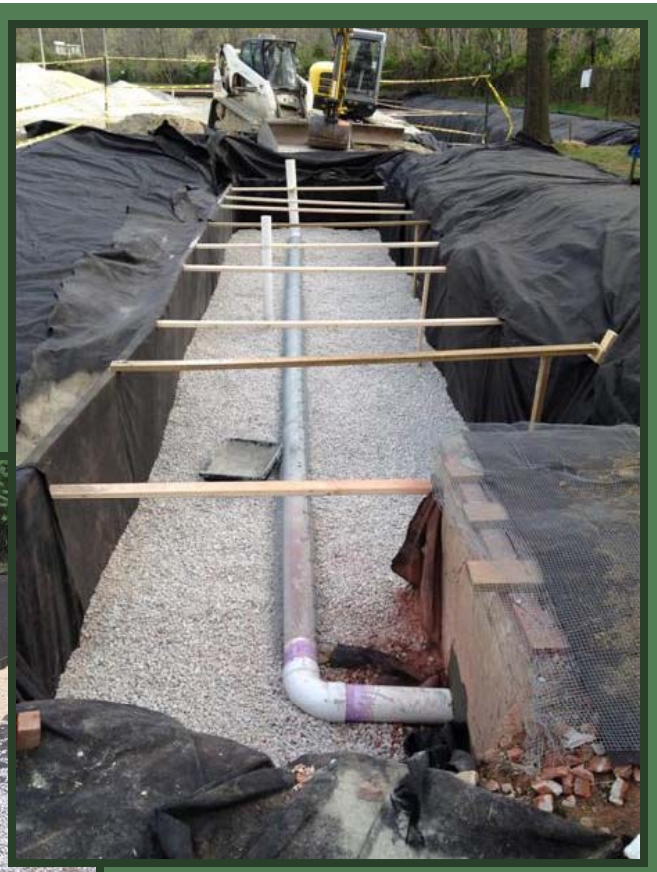
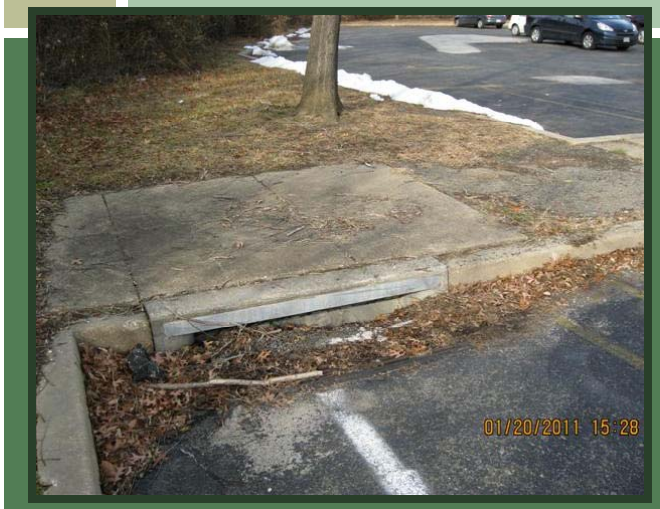
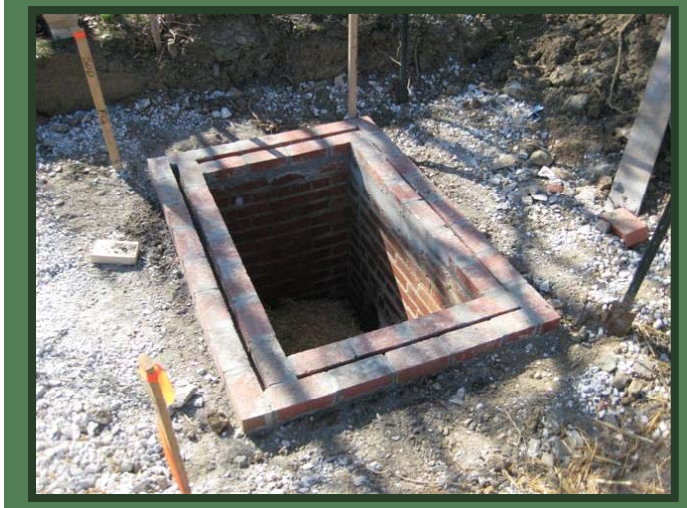
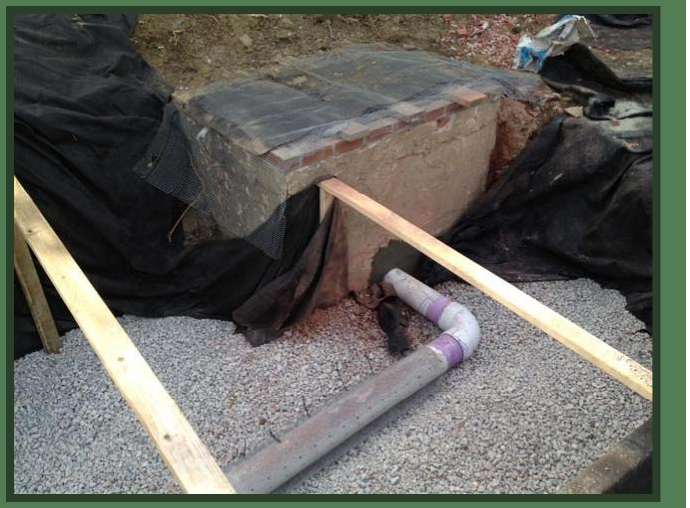




Construction – Inlet Modification







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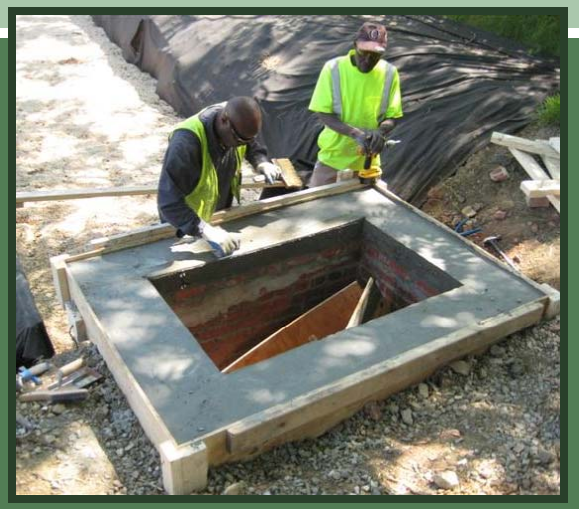

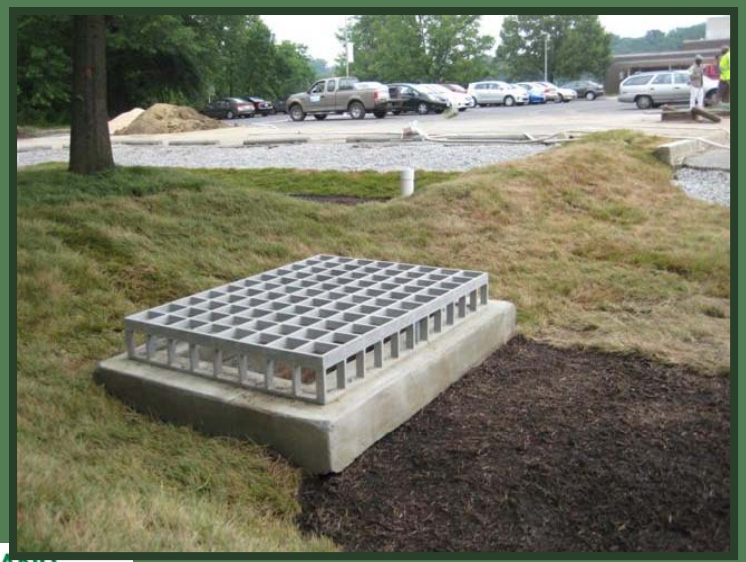

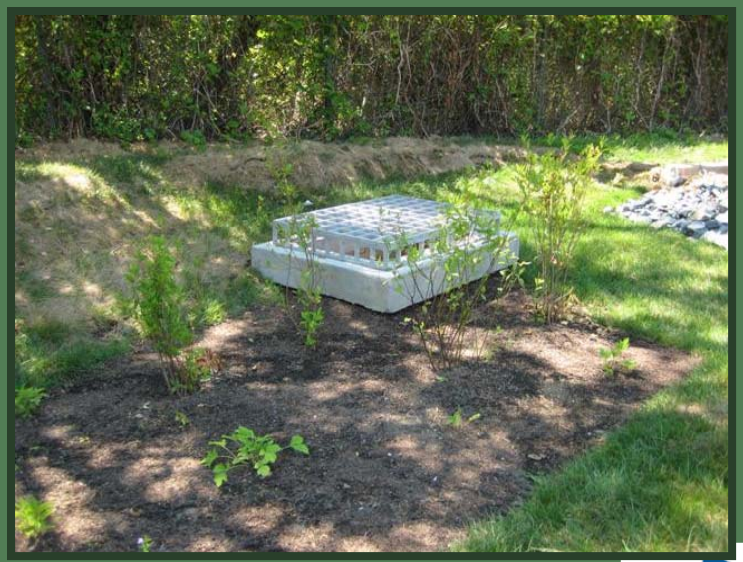

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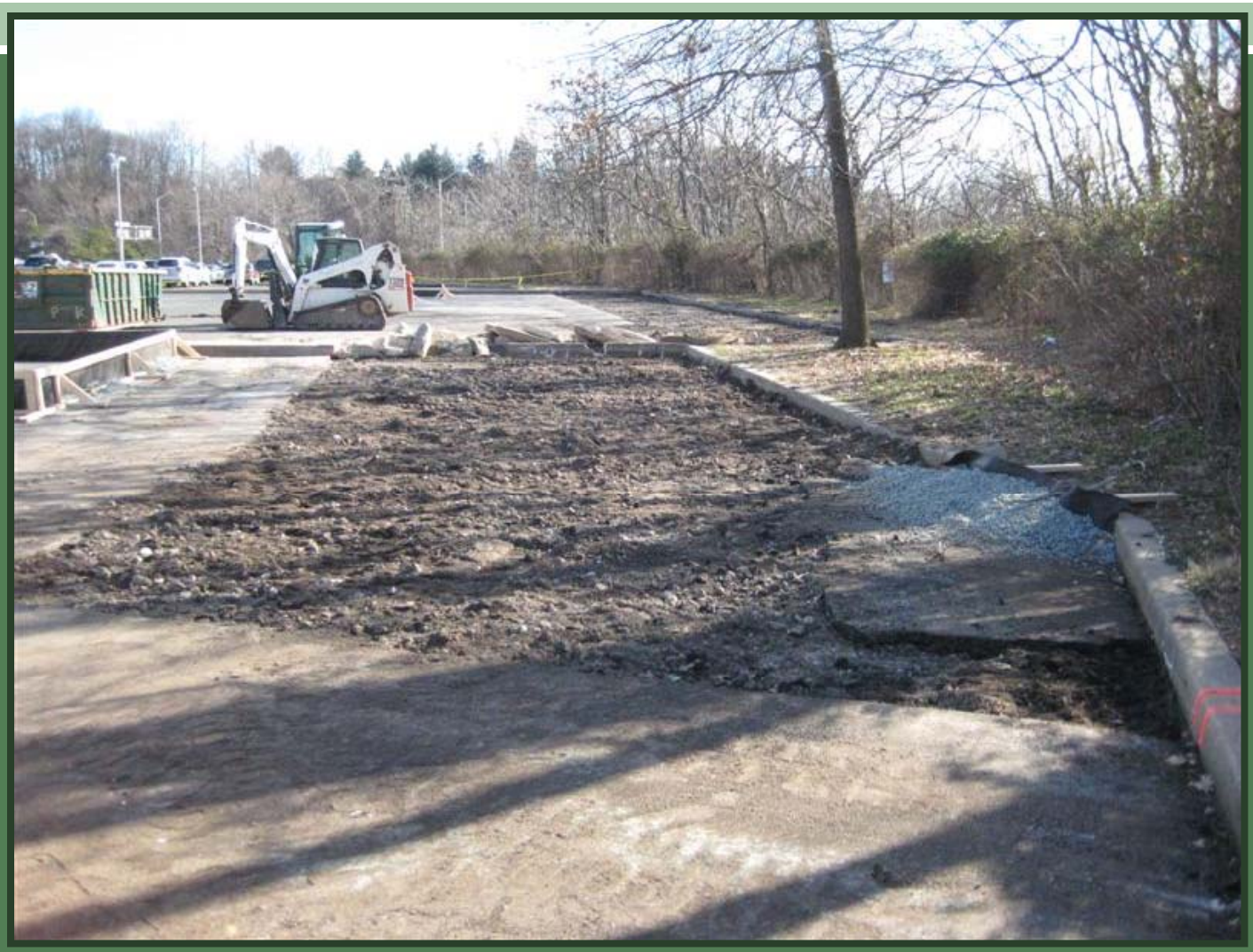
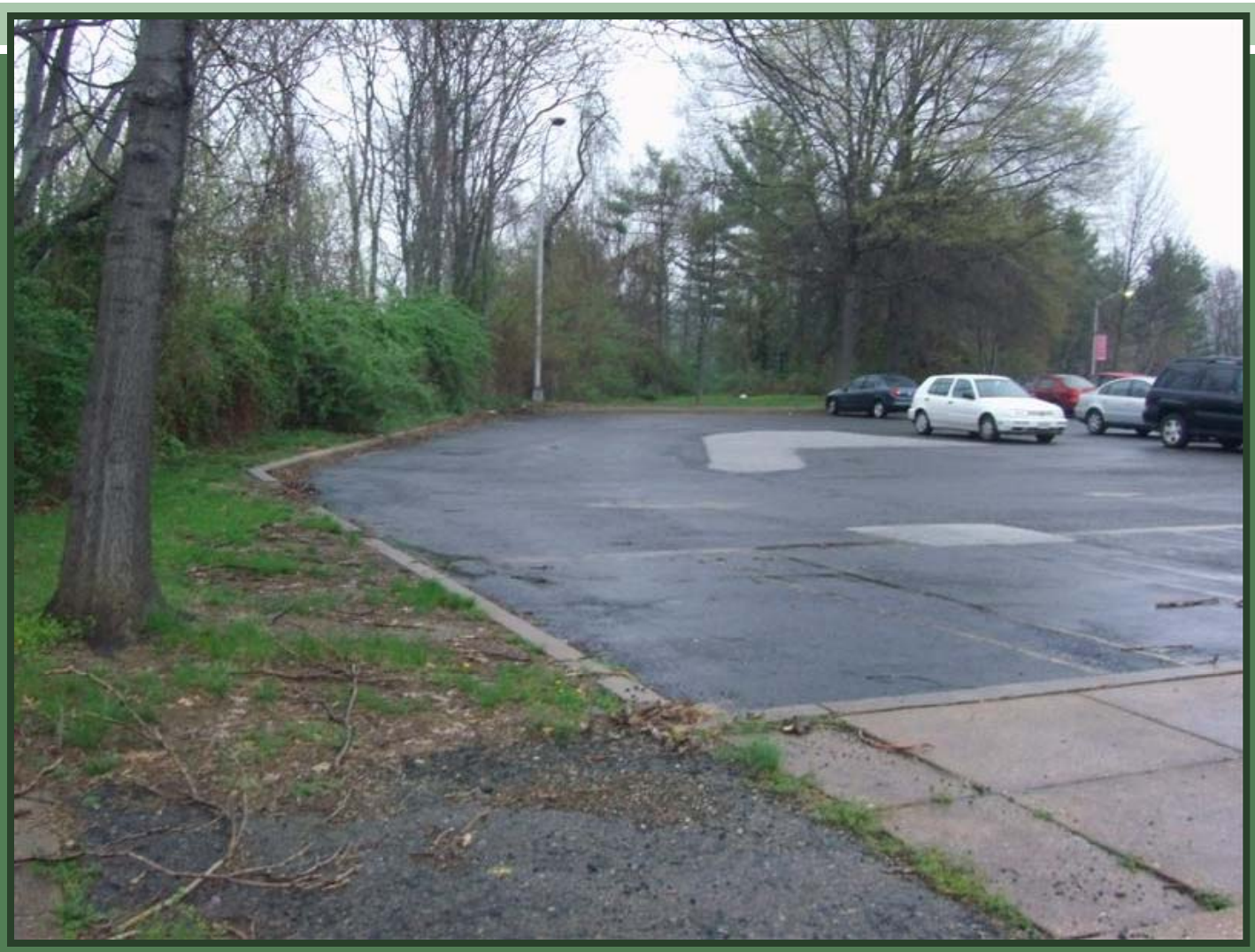


...After

Before…



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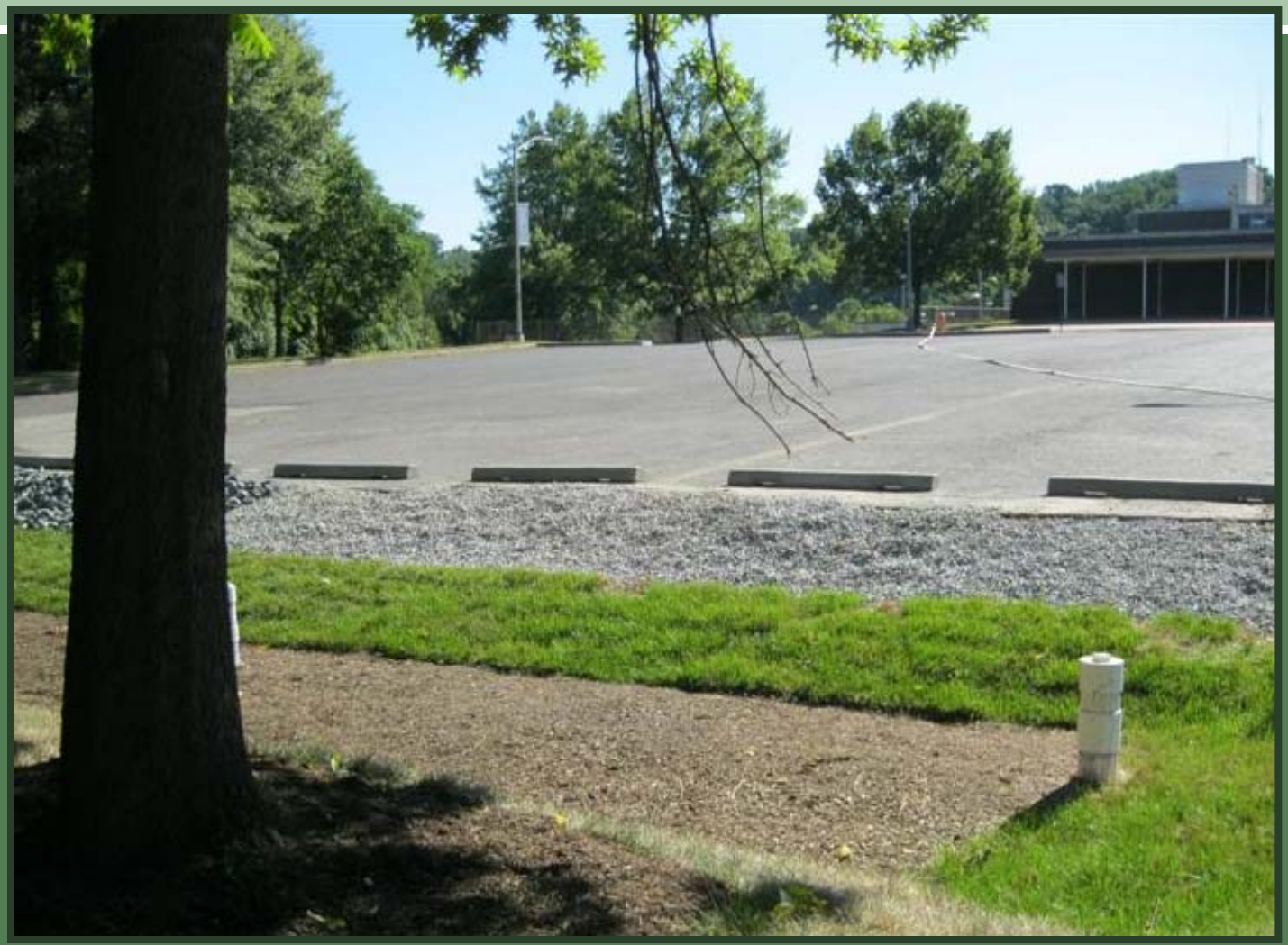
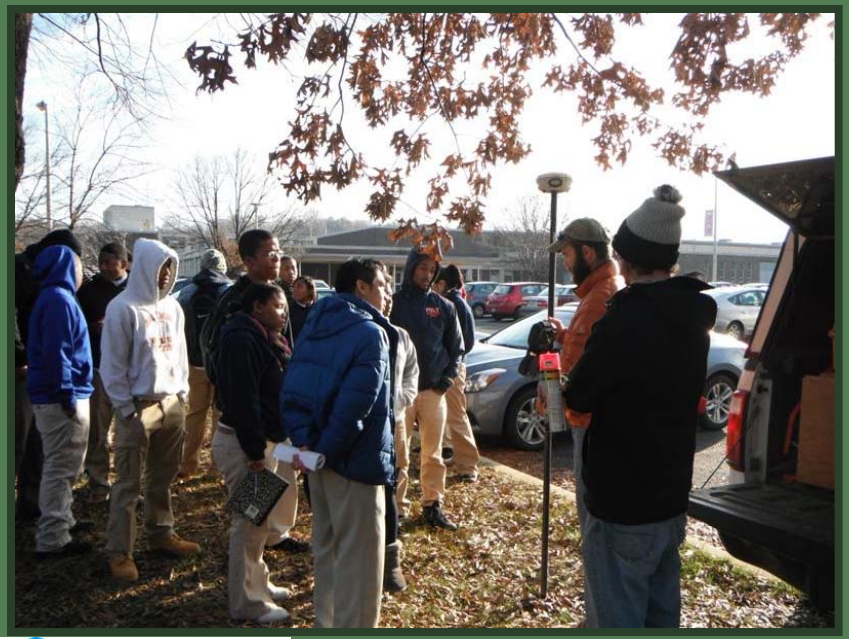
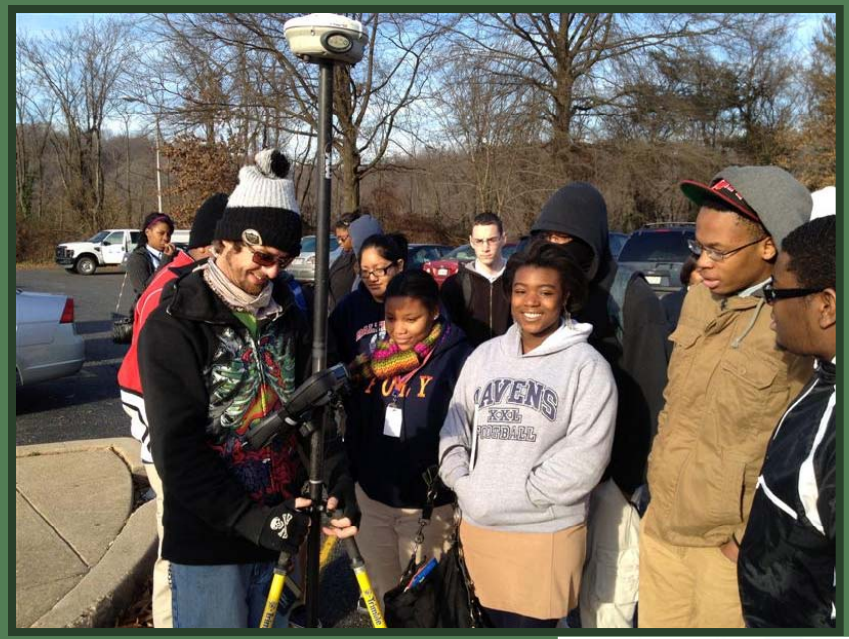


Student Engagement & Participation

DURING CONSTRUCTION, STUDENTS HAD THE OPPORTUNITY TO:

- Observe the construction process
- Learn about design, surveying and estimating
- Learn about planting a micro-habitat

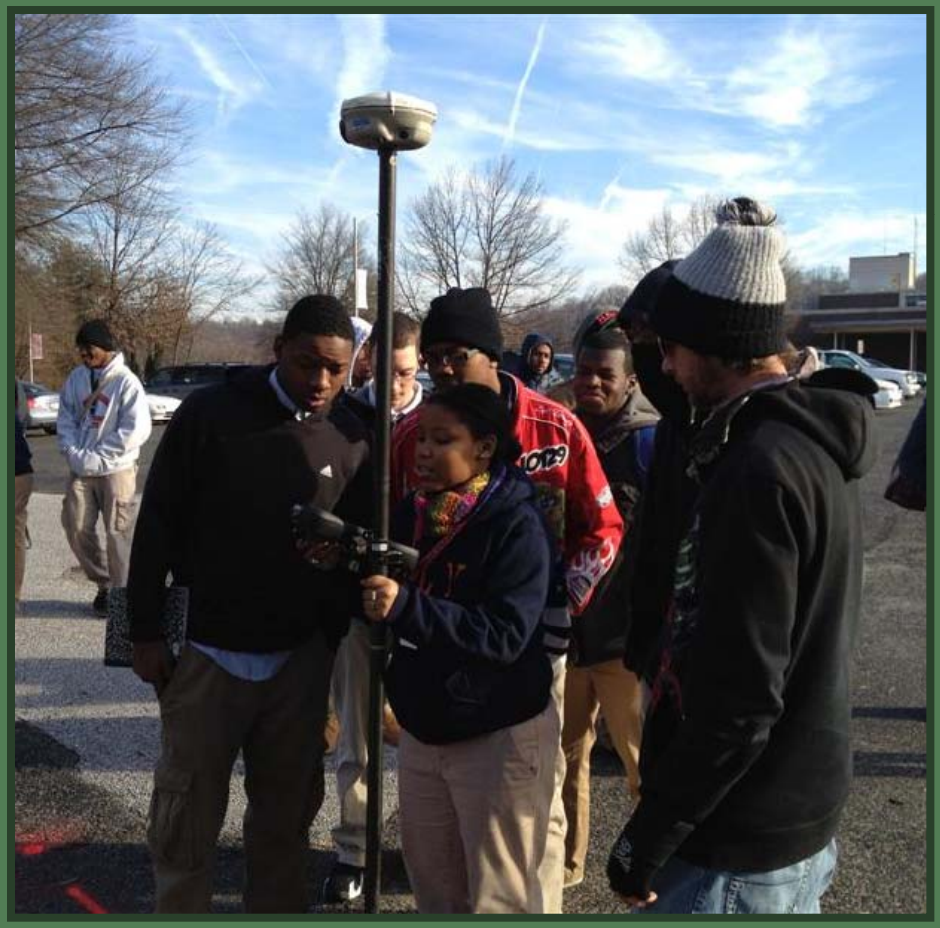




Student Engagement & Participation

STUDENTS NOW HAVE THE OPPORTUNITY TO:

- Monitor improvements to water quality
- Develop a better understanding of the importance of stormwater management in an urban setting
- View the native birds and insects within the micro-habitat



Schoolyard Greening

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