American Street Improvement Project

Kevin Selger, RLA, ASLA, LEED AP
Trevor Woodward, PG
Nicole Carey, EIT

Gilmore & Associates, Inc.
Engineers, Geologists, Surveyors, Landscape Architects

2019 STORMWATER MANAGEMENT SYMPOSIUM
VILLANOVA UNIVERSITY COLLEGE OF ENGINEERING CENTER FOR RESILIENT WATER SYSTEMS “Building Resilience Into Stormwater”
American Street Improvement Project

• Scale
  • 2 Miles x 120’ ROW = 29+ acres

• Funding ($26M+)
  • City partnership with PADOT and FHWA
  • $5M USDOT TIGER Grant
  • PWD GSI Funds ($5.5M)

• Schedule
  • 16-month design timeframe
  • 3 Year construction timeframe

• Design Team

 Delaware River

GIRARD AVE

CENTER CITY

AMERICAN STREET

LEHIGH AVE

INDIANA AVE

Two Miles Long

120’ Wide Right-of-Way
American Street Improvement Project

Franklin School, Cecil B. Moore

Crane Arts Building
Complete Streets Project

- Streetscape and Paving
- Green Stormwater Infrastructure (GSI)
- Landscape Improvements

- Accessibility and Pedestrian Safety
- Multimodal Transportation Improvements
  - Walk – Bike – Bus – Car/Truck
  - Raised/Protected Bike Lanes
Stakeholders

• Agency (City, State & Federal):
  
  ![Agency Logos]

• Community
  • Community Members- Residents & Business Owners (Commercial/Industrial)
  • Elected officials/City Council and Council Staff

• Interagency collaboration enables successful large-scale GSI projects
Community Engagement

- Steering Committee Meetings
  - 5 Total Meetings
- Public Open Houses
  - 6 Total Meetings
  - Multiple Locations
  - Translators
- Business Owner Meetings
  - Separate from Open Houses
- Public Officials Meetings
Infiltration Columns
Philadelphia Geology

• North section of City:
  • Wissahickon Formation (Lower Paleozoic)
    • Metamorphic Bedrock (Less Favorable)

• Southeast section of City:
  • Trenton Gravel (Quaternary)
    • Unconsolidated Outwash (More Favorable)

• Fill-Urban Land
  • Variable/Impacted
    • Unfavorable
Philadelphia Geology
Subsurface Testing

• 1st Phase
  • Geotechnical test borings
  • Environmental sampling
    • Report/Review/Adjust

• 2nd Phase
  • Borehole Infiltration tests
    • Above water table
  • Column Inflow tests
    • Below water table
1st Phase – Geotech/Enviro Study

- Field Study Documentation
  - Surface Cover
  - Fill
  - Strata
  - Water
  - Environmental Samples

- Recommendations
  - Prioritized locations and system types
Stormwater Infiltration Column

- Stormwater Management
  - Reduce runoff
  - Protect water quality
  - Promote recharge

- Infiltration Column: 20’ Deep; 14” diameter; 6” PVC casing; indirect connection

- First in Philadelphia

- Variation on Bedrock Systems
2\textsuperscript{nd} Phase – Infiltration Testing Results
Infiltration Column Installation & Testing

2019 STORMWATER MANAGEMENT SYMPOSIUM
Green Stormwater Infrastructure
GSI on American Street

- PWD’s *Green City, Clean Waters* Program

- GSI Design Criteria:
  - PWD GSI Planning & Design Manual (Version 1.0)
    - Right-of-Ways/Streets
    - Public Spaces/Parks

- GSI Selection Process:
  - Partner Agency Approval & Coord.
  - GSI Maintenance
  - Transportation Needs
    - Roadway – Cars, Buses, Trucking
    - Parking
    - Bikes
  - Pedestrian Safety
  - Green Space Maximization
**GSI on American Street**

- **Selected GSI Systems:**
  - Bioswales
  - Rain Gardens
  - Subsurface Stormwater Trenches
    - Infiltration
    - Lined/Slow-Release
  - Tree Pits (400+)
    - ~250 GSI Trees
    - ~150 Standard Street Trees
  - Infiltration Columns

- **42 GSI Systems Designed**
  - Aimed for 2-Inches of Runoff Capture per System
    - Did not go below 1-Inch of Capture
  - 10-year Storm Conveyance

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2019 STORMWATER MANAGEMENT SYMPOSIUM

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GSI Design & Utilities

- Former railroad tracks made ideal location for GSI
  - No Utilities
  - Available Unused Space
  - Linear Along the ROW
GSI on American Street – Metrics

• More than 1.1M SF of DA captured and managed
  • Managing more than 90% of total impervious remaining on corridor
  • 4-acres of additional DA from side streets
• Almost 2-acres of GSI Vegetated Area
• GSI will collect more than 1.4M gallons of stormwater runoff from the right-of-way
  • 2-Inches of Static Storage
• More than 50 Greened Acres towards PWD’s *Green Cities, Clean Waters* program for waterway pollutant reduction
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Thank You!

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