

# Utilizing LID within the County Right of Way to Satisfy MS4 Requirements

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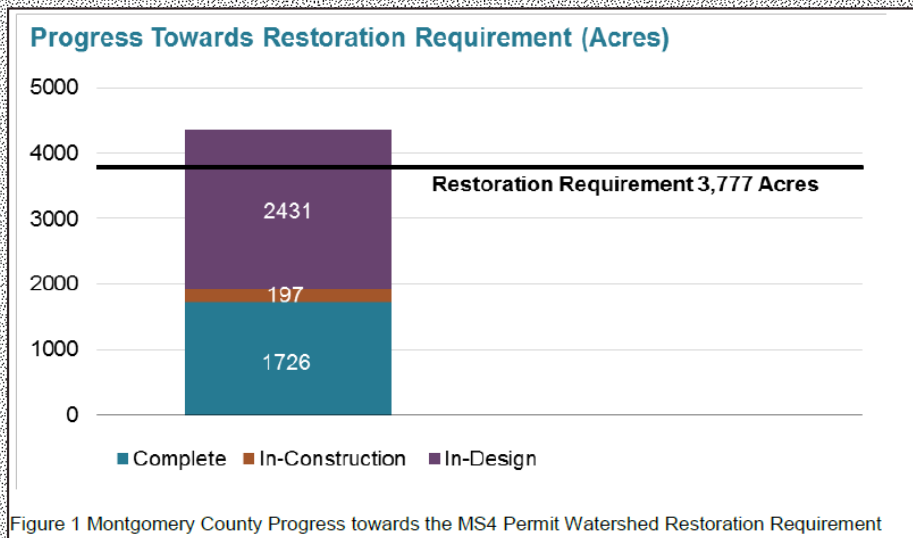
October 20, 2016





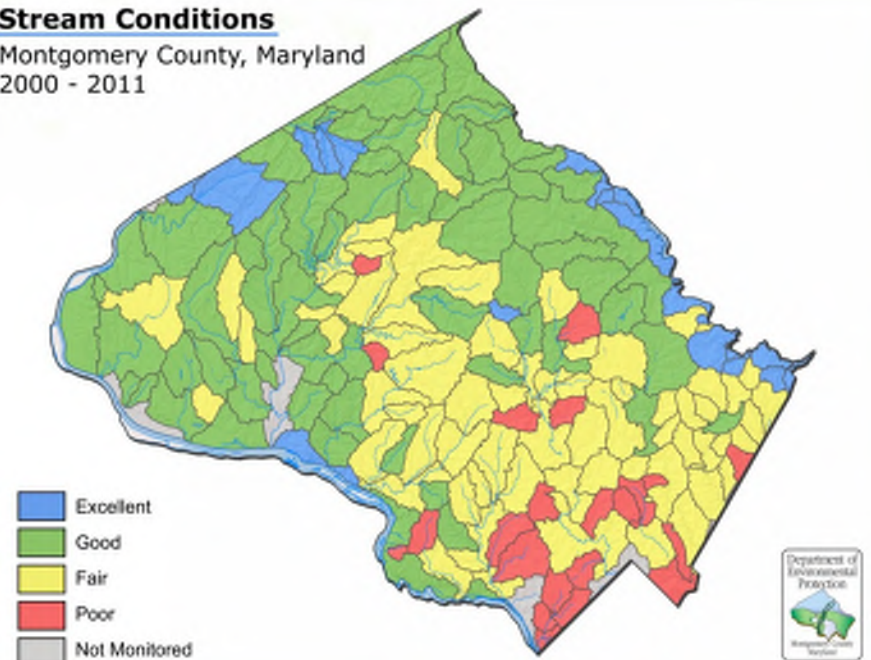
# Regulatory Requirements

- Federal Clean Water Act permit program
- **MS4 = Municipal Separate Storm Sewer System**
  - Provide SWM for 20% of Impervious Surfaces (approximately 5.9 square miles)



## Stream Conditions

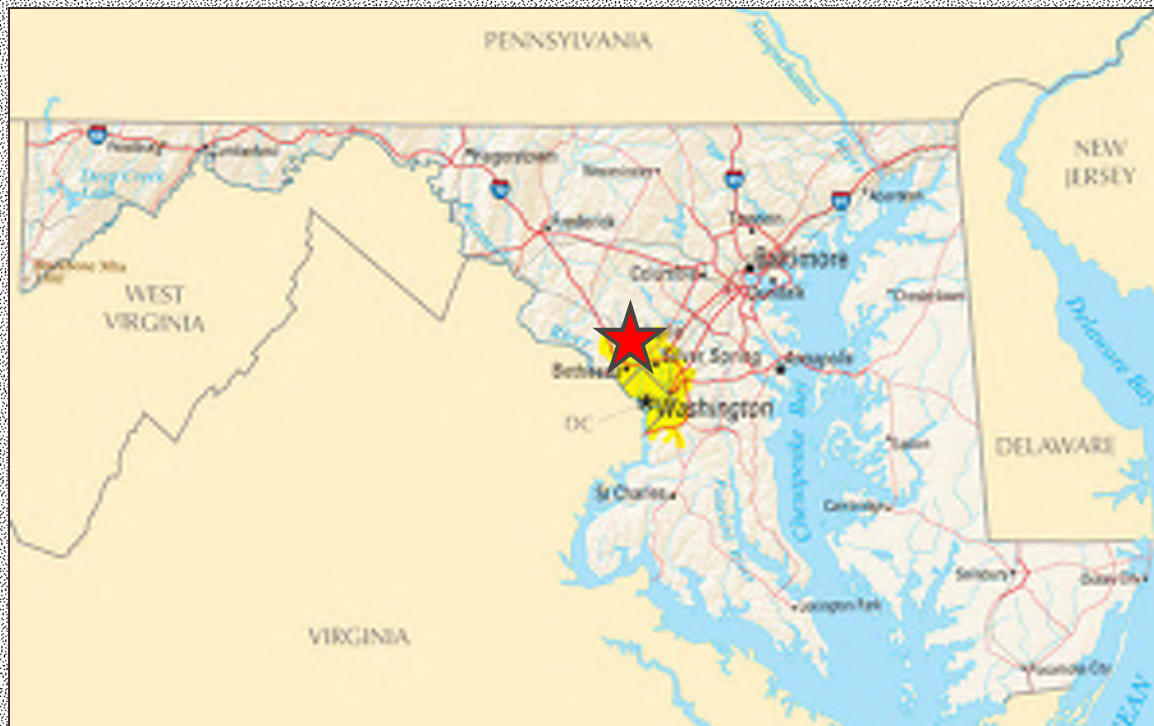
Montgomery County, Maryland  
2000 - 2011





# ESD & LID Projects

- Forest Estates – 33 acres
- Franklin Knolls (4 Phases) – 147 acres
- Wheaton Woods – 270 acres





# Neighborhood Demographics

- Neighborhoods built in the late 1950's & early 1960's
  - Single family detached residential housing
  - Curb & gutter with sidewalks
  - Mature trees
  - Utilities
- No existing SWM facilities





# Preliminary Watershed Assessment

## Roadway LID Field Data Sheet

32

Data Collector: KS. WWC 1/10/11

Opportunity ID# \_\_\_\_\_

Proposed Site Location (Address or street): 10300 Toward Ave. (along Woodman N.)  
See site 11

### Photographs:

☐ Site Photo Documented? Photo #: 62  
Note where photo was taken and direction on map

Verify Mapped Data is Accurate (if not, note any inconsistencies on map):

- ☒ Storm Drain System
- ☐ Contours (Drainage Area)
- ☐ Utilities
- ☐ Paving/Impervious areas
- ☐ Other:

### SWM Practice Proposed:

- ☐ Bioretention/Rain Garden
- ☐ Bio-swale
- ☐ Other:
- ☐ Curb Extension
- ☒ Tree Box Filter

### Possible Conflicts:

- ☒ Utilities (list type): water
- ☒ Vegetation/Trees tree removal
- ☐ Other:

### Notes:

possibly remove walkway between curb + sidewalk too  
locate tree box w/ of curb a bit to avoid conflicts

- GIS Desktop Analysis
- Field Walk
- Summary Tables and Mapping
- Assessment of Opportunities
  - Feasibility
  - Aesthetics
  - Constructability
  - Maintenance



**BMP # 5**

Location: **8901 Miles St**  
**Franklin Knolls Neighborhood - Phase 1**

Inspection Date: **4/14/2011**

**Hydrology Summary**

Land Use	Area (ac)	Percentage
Impervious Area	0.30	31%
Forest	0.01	1%
Open Space	0.66	68%
<b>Total Drainage Area =</b>	<b>0.97</b>	<b>100%</b>

**Impervious Area Breakdown**

Area Type	Area (ac)	Percentage
ROW - Road & Driveways	0.15	50%
ROW - Sidewalk	0.00	0%
On-Lot Impervious	0.15	50%
<b>Total Impervious =</b>	<b>0.30</b>	<b>100%</b>

**SWM Volume Summary (ft<sup>3</sup>)**

Target Treatment		Treatment	% ESD <sub>v</sub>
WQ <sub>v</sub>	ESD <sub>v</sub>	Provided	Treated
1,156	2,081	847	41%

**Study Area/Outfall** **A**

**Possible Construction Conflicts**

Utilities: sanitary  
 Vegetation: brush  
 Others:

**Potential LID Retrofit Type**

**Bioretention & Pavement Removal**

**Site Notes:**

- Existing storm drain system and inlet available to tie facility underdrain into
- Sanitary is located within the roadway - possible house connections
- Water line is located within the roadway - possible house connections
- Could remove pavement at dead end of Langley Drive for pavement removal credit, could be combined with curb extension
- Good area for bioremediation or tree box on corner of 8901 Miles
- Past pavement on either side of stream channel (8901 Miles and 924 Heron,) has room for rain garden



Looking towards end of Langley Drive and 904 Heron from intersection of Miles St. and Langley Dr.



Looking towards corner of 8901 Miles St. from intersection of Langley Dr. and Heron Dr.

**Over 600 sites initially identified as part of the Preliminary Assessments**



# Supporting Information

- Topographic Survey
- Utility Designation and SUE
- Geotechnical Analysis - Soil Borings and Infiltration Tests
- Environmental Features





# Roadway Design Constraints



- Width of County ROW (curb to sidewalk)
- DOT setbacks/clear space requirements
- Driveway/Leadwalk Locations
- On-street parking
- Slope of roadway



# Additional Design Constraints

- Existing Trees/Roadside Tree Permit
- Underground and Overhead Utilities
- Existing Soils/Infiltration Rates
- Property Owner Complaints and Preferences





# Final Designs

- Forest Estates - 24 facilities constructed
- Franklin Knolls (4 Phases) – 119 facilities constructed
- Wheaton Woods – 200+ facilities under design



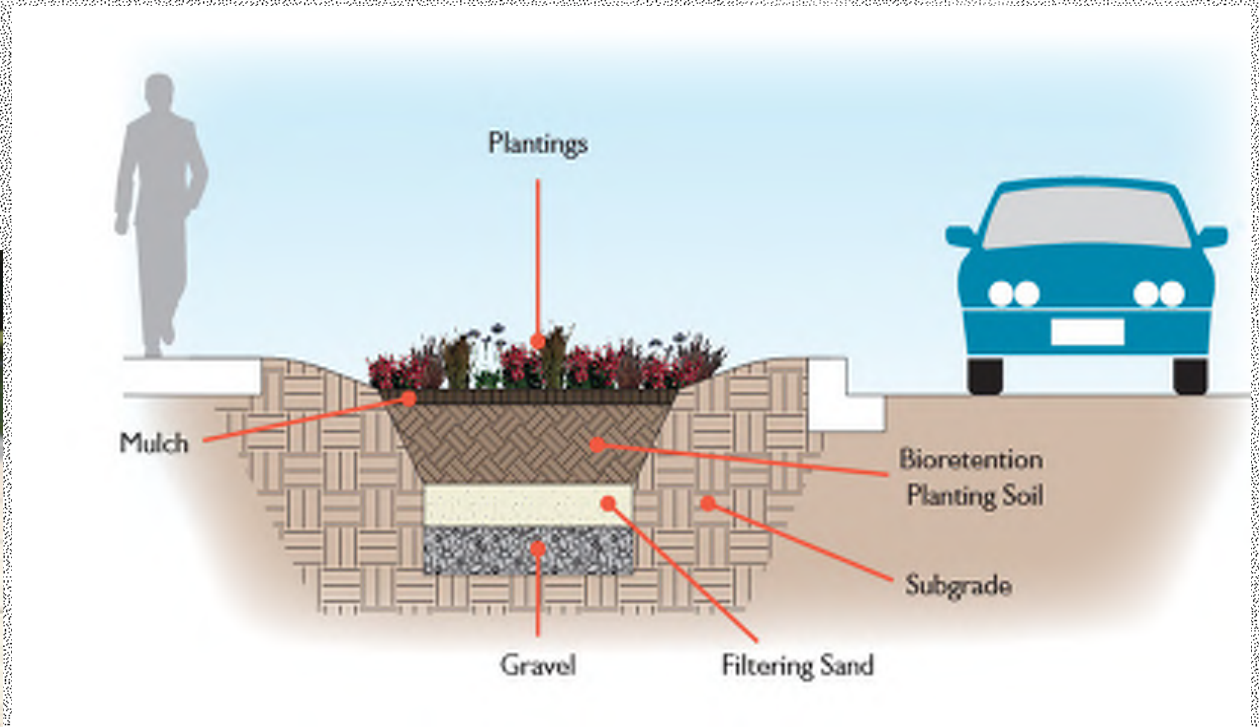


# Types of ESD/LID Facilities



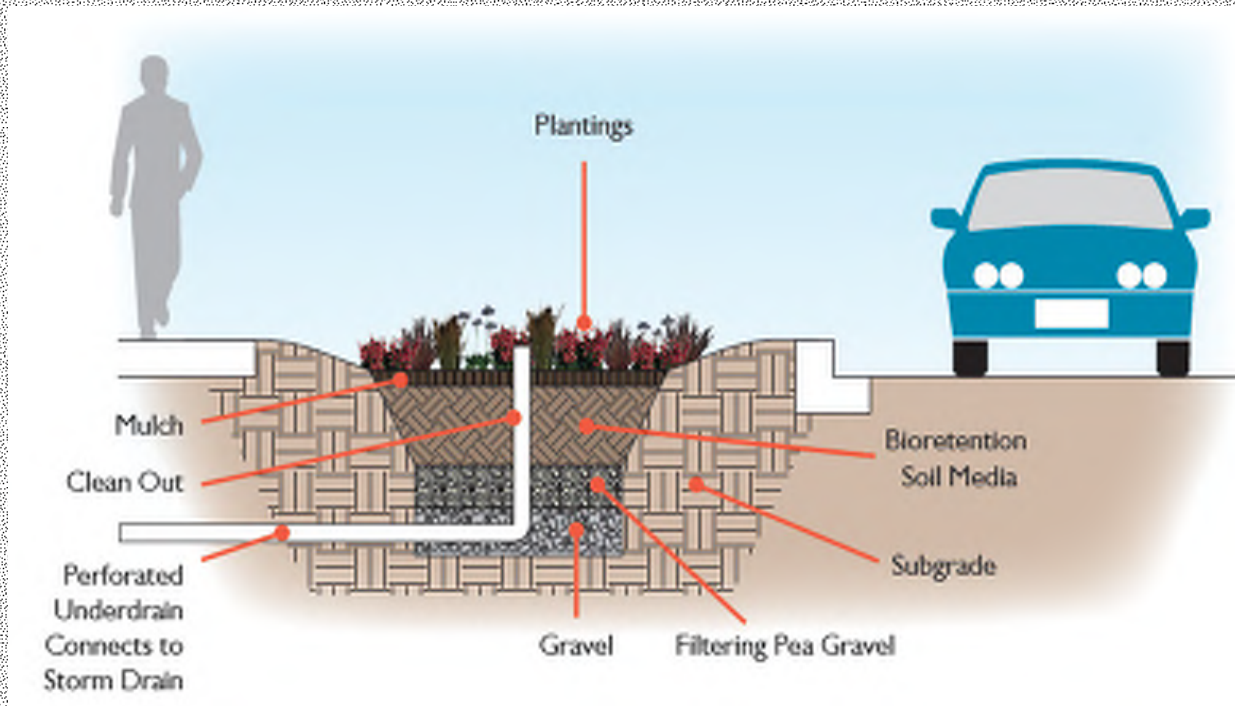


# Rain Garden





# Bioretention





# Curb Extension





# Bioswales

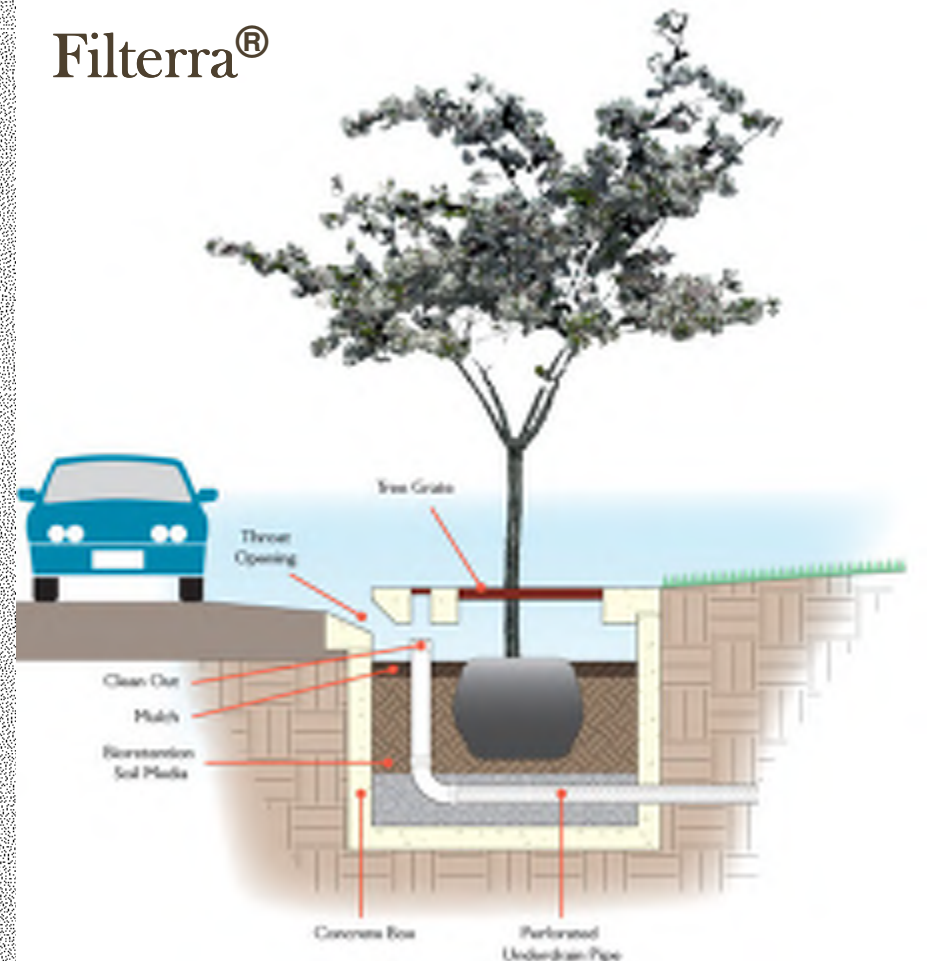






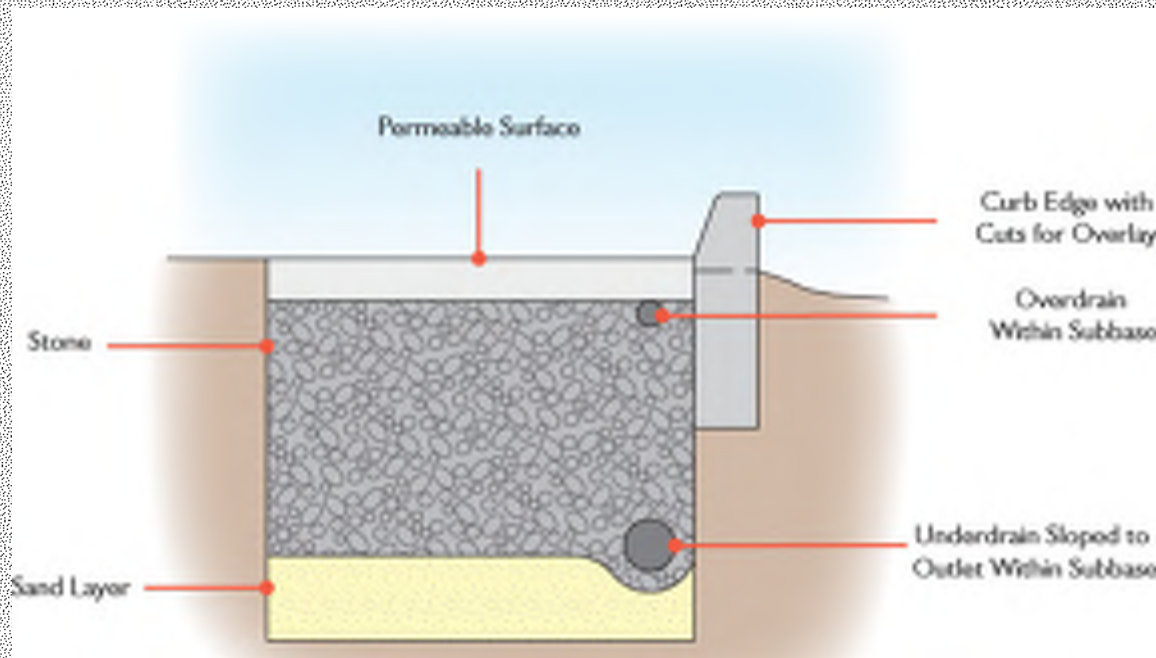
# Tree Box Filter

Filterra®





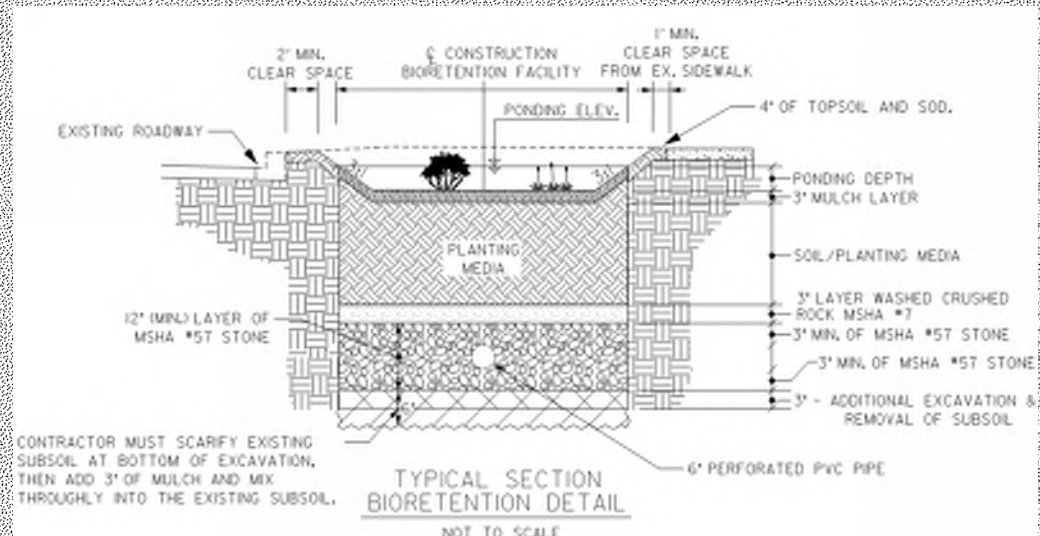
# Permeable Sidewalk





# Project Specific Design Modifications

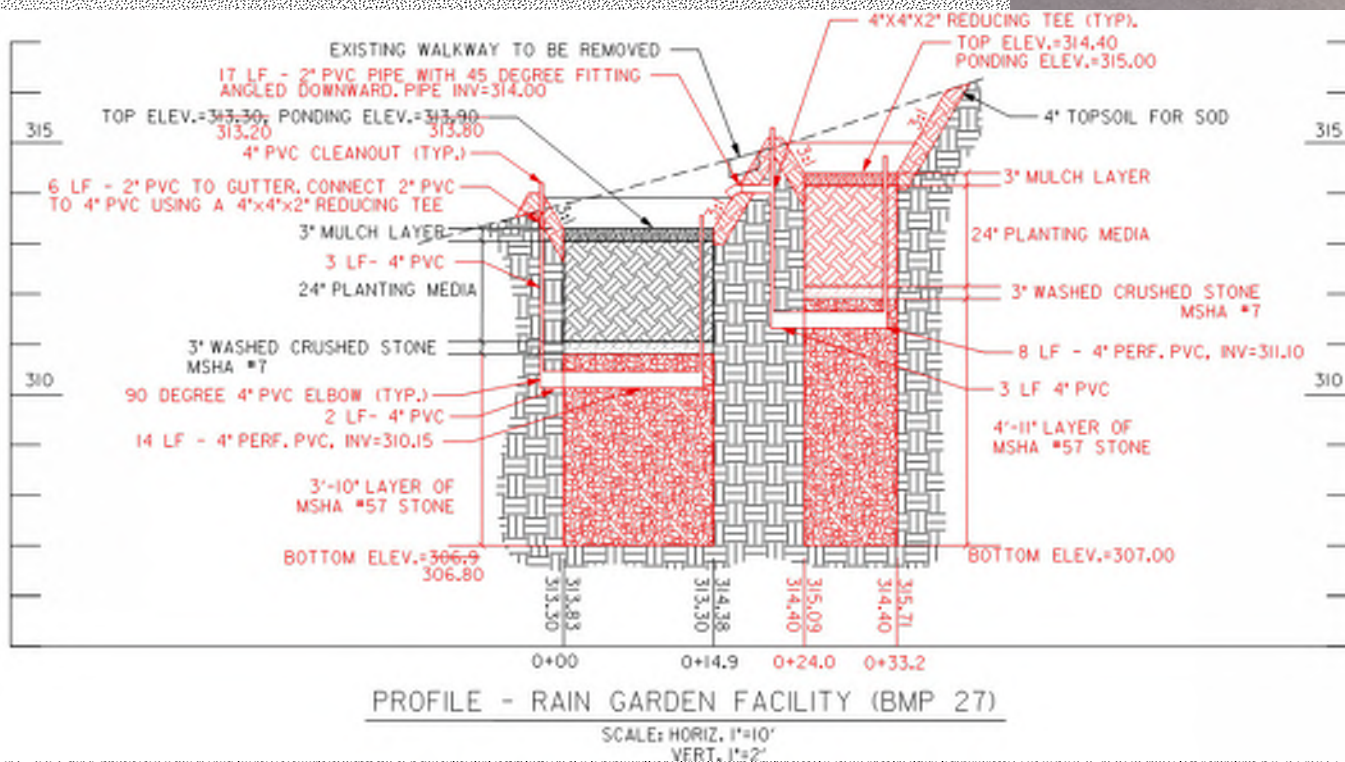
- Modified Inlets
- Scarify existing subsoil & till in mulch
- Widened filter media & stone





# Project Specific Design Modifications

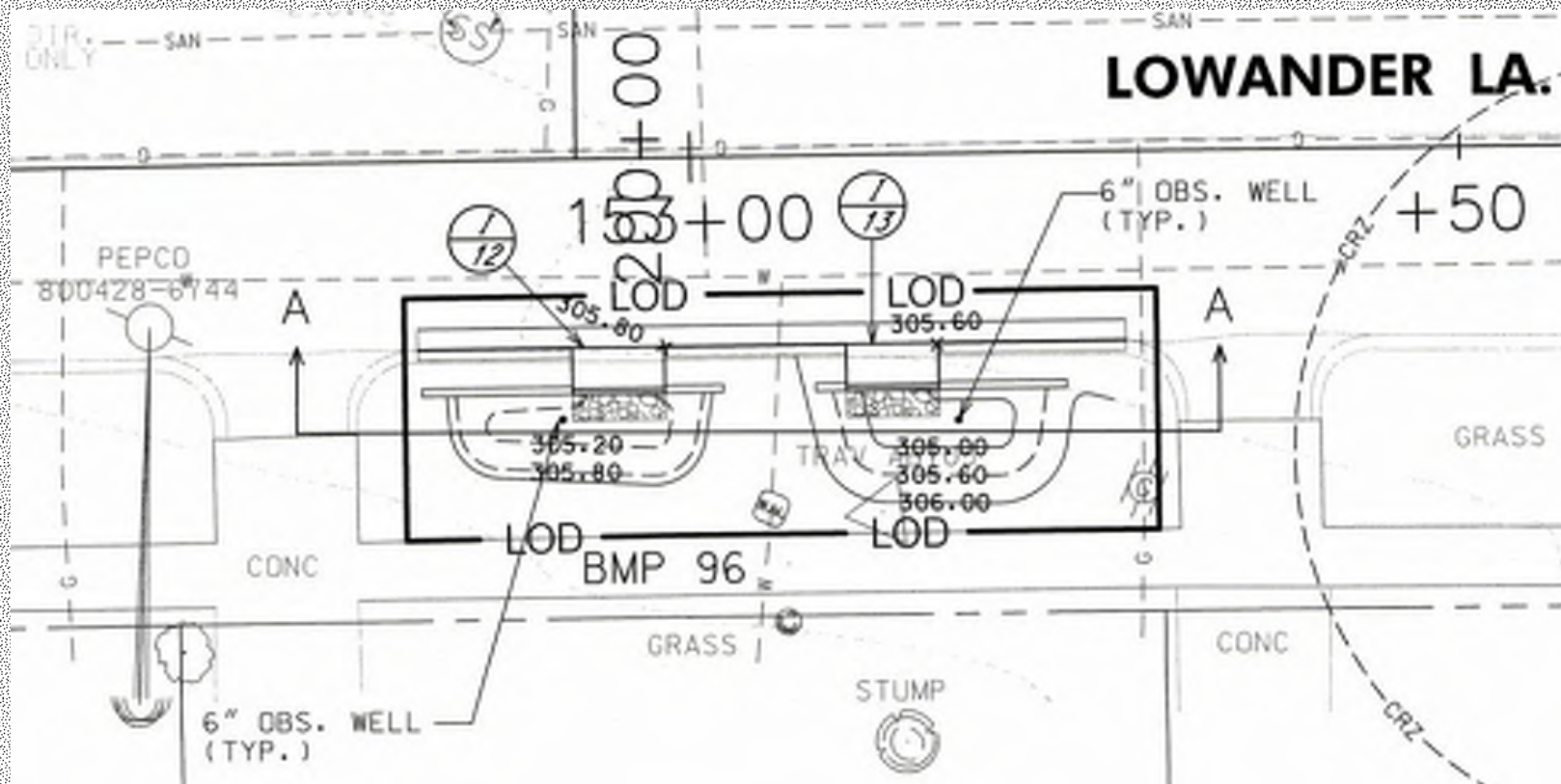
- Reverse underdrains





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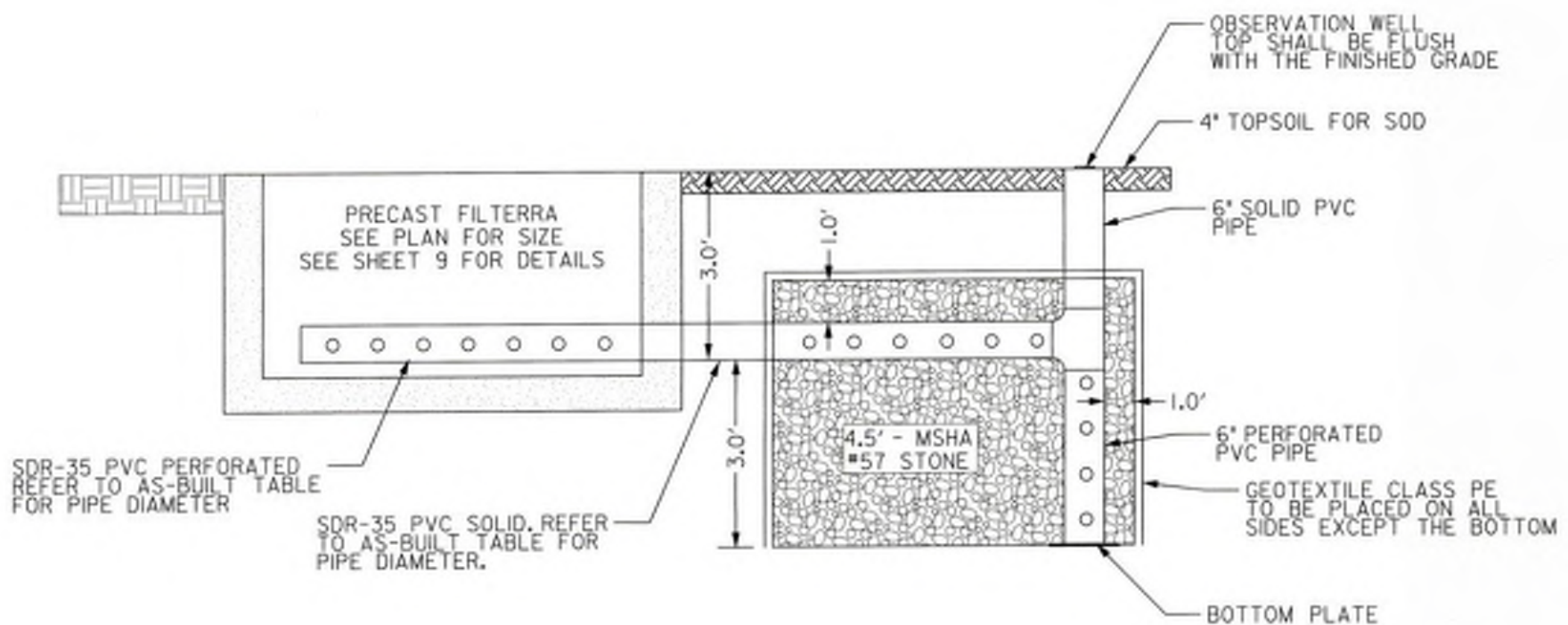
- Bridge over existing utility house connections
- Concrete edging along front side of facility





# Project Specific Design Modifications

- Filterra draining into stone reservoir



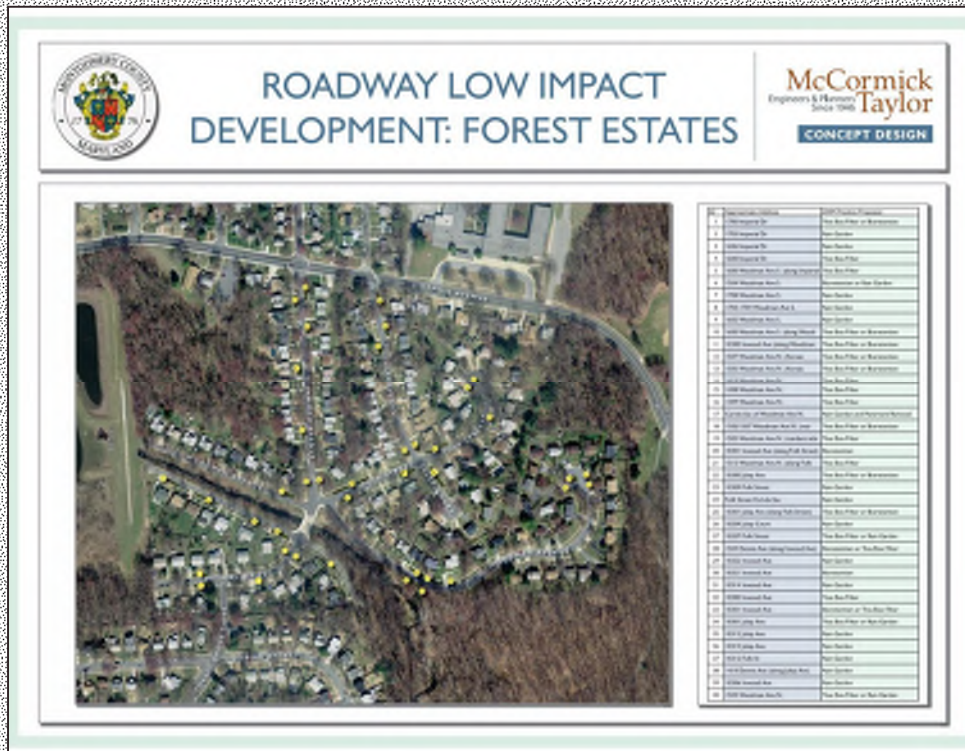
TYPICAL FILTERRA AND STONE TRENCH DETAIL

NOT TO SCALE



# Community Outreach

- Public Meetings
- Community Walks



- One-on-one meetings with property owners
- Educational Opportunities



# Construction

- MCDOT Coordination
  - Utility Improvement Coordination
- Community Involvement
- Design/Field Modifications





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