

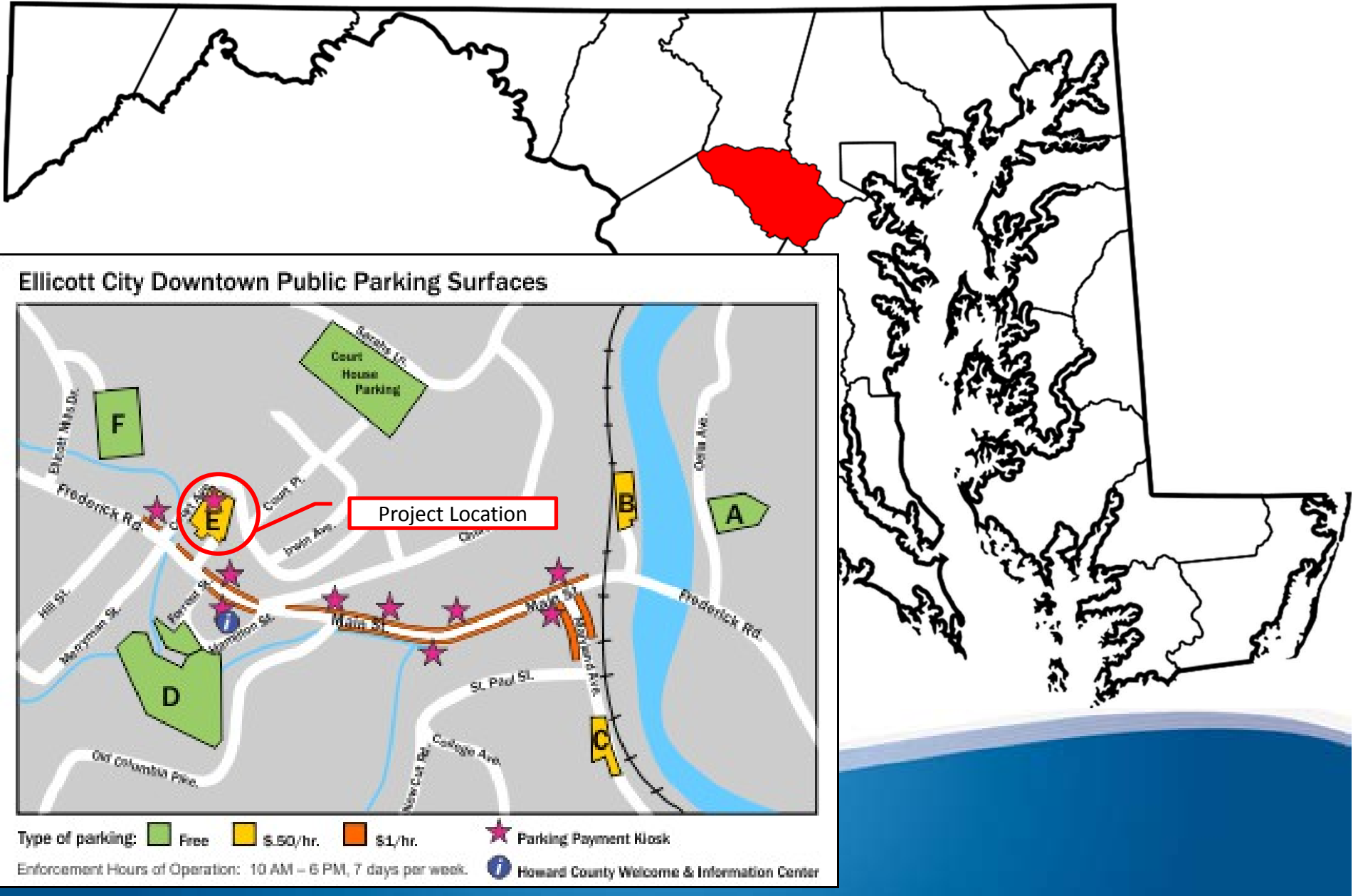
ELLICOTT CITY PARKING LOT E

Urban Retrofit Design - Howard County, Maryland

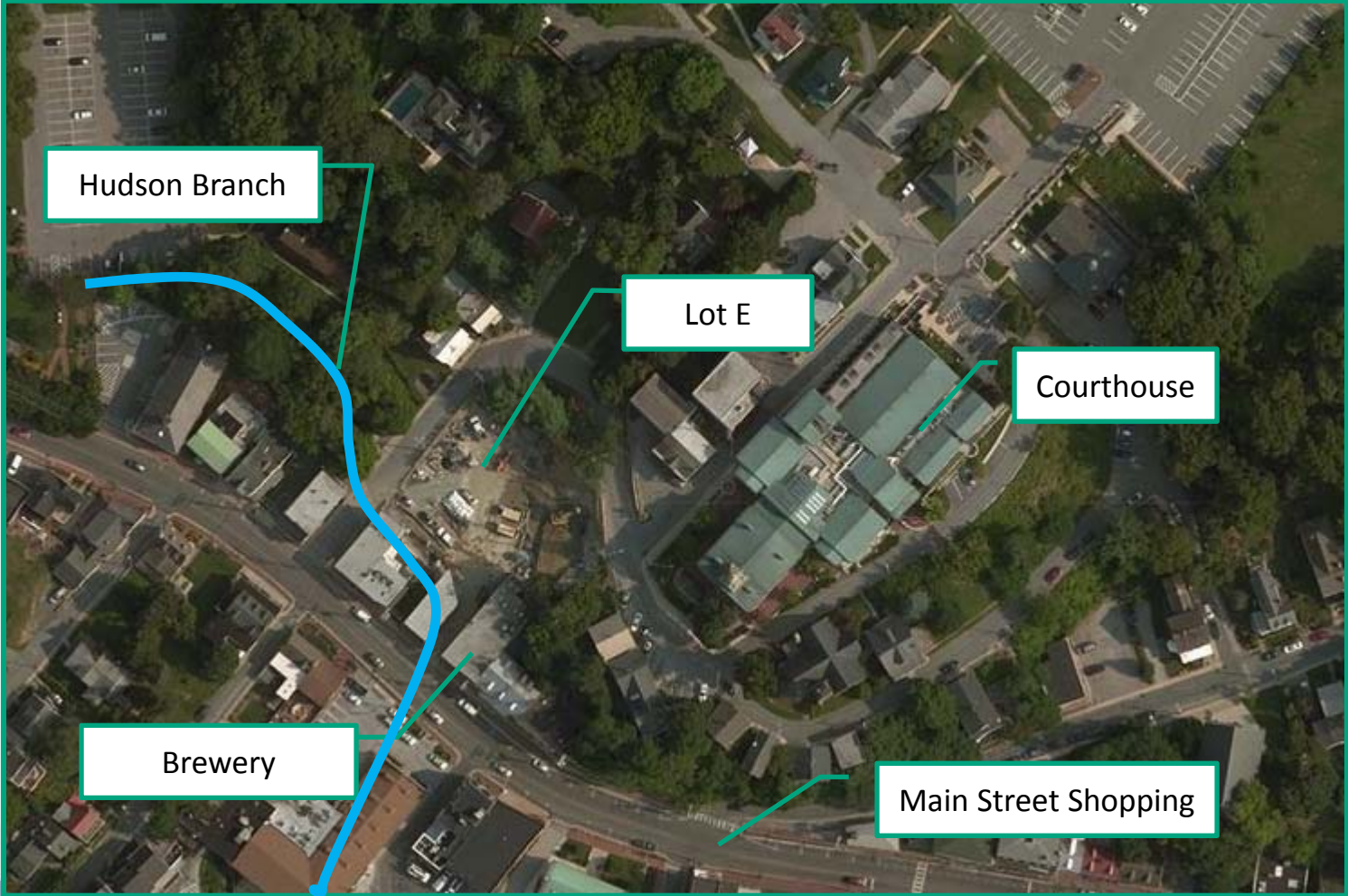
Chris Brooks, P.E.



Historic Downtown Ellicott City

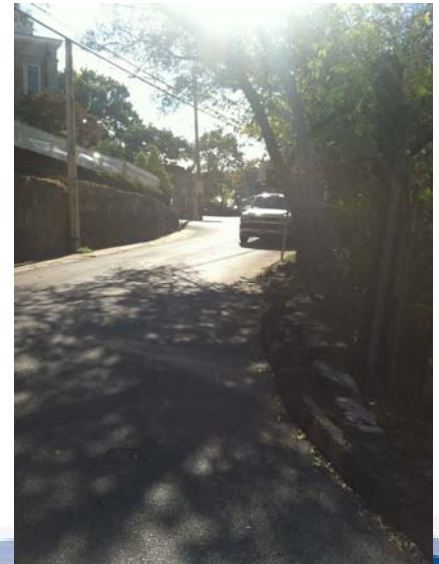


Project Setting and Surrounding Features



Initial Project Evolution

1. Failed Retaining Wall
2. Connection to Parking
3. Desire for Water Quality



Project Components: Water Quality

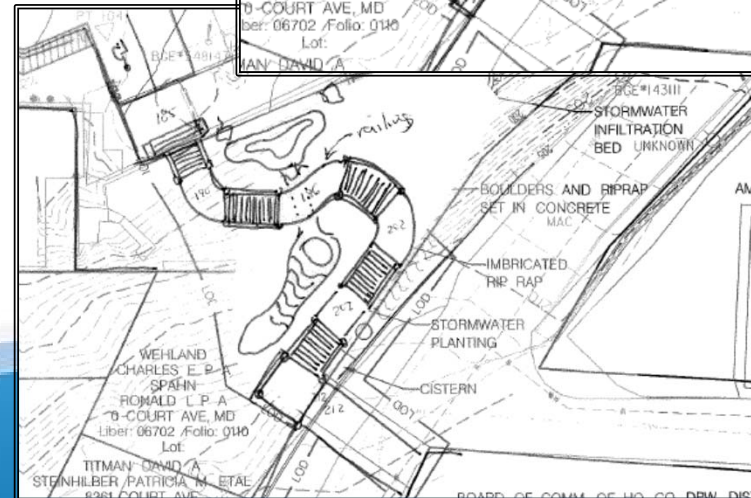
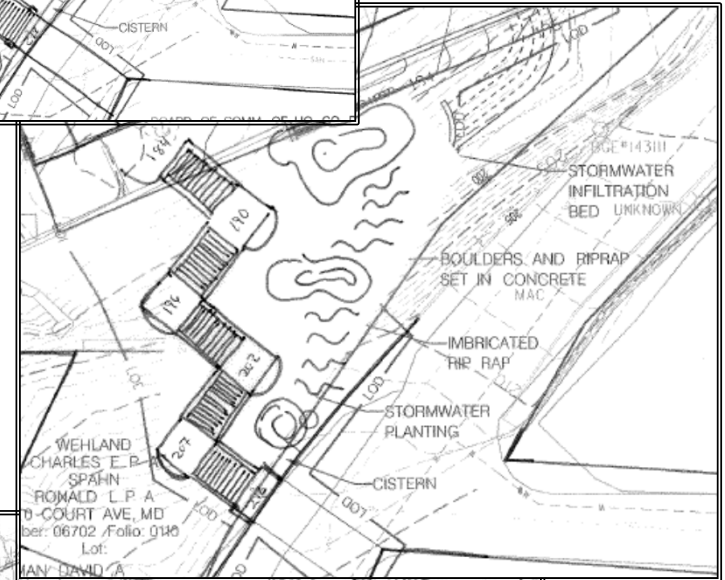
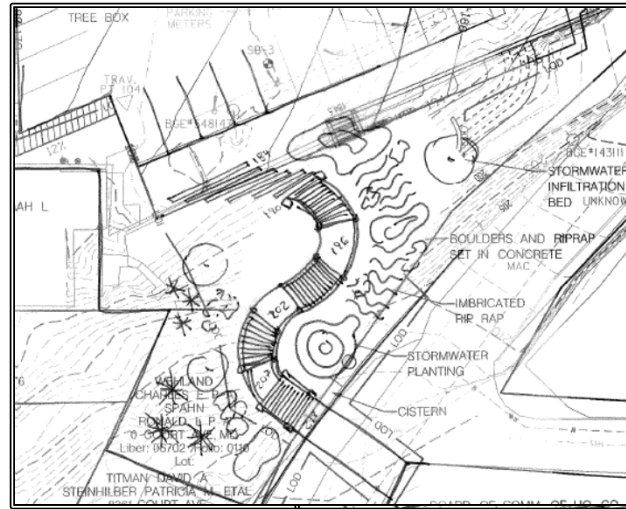
- Site features steep slopes and confined channel surrounding pavement
- Need to maximize parking
- Soils and bedrock unfavorable for pervious pavement



Project Components: Staircase / Retaining Wall

- Shorten the walking distance from Courthouse to Main St.
- Works in concert w/ retaining wall repair
- Provides opportunity to incorporate water quality features into the slope

...begin the brainstorming!



Project Concept

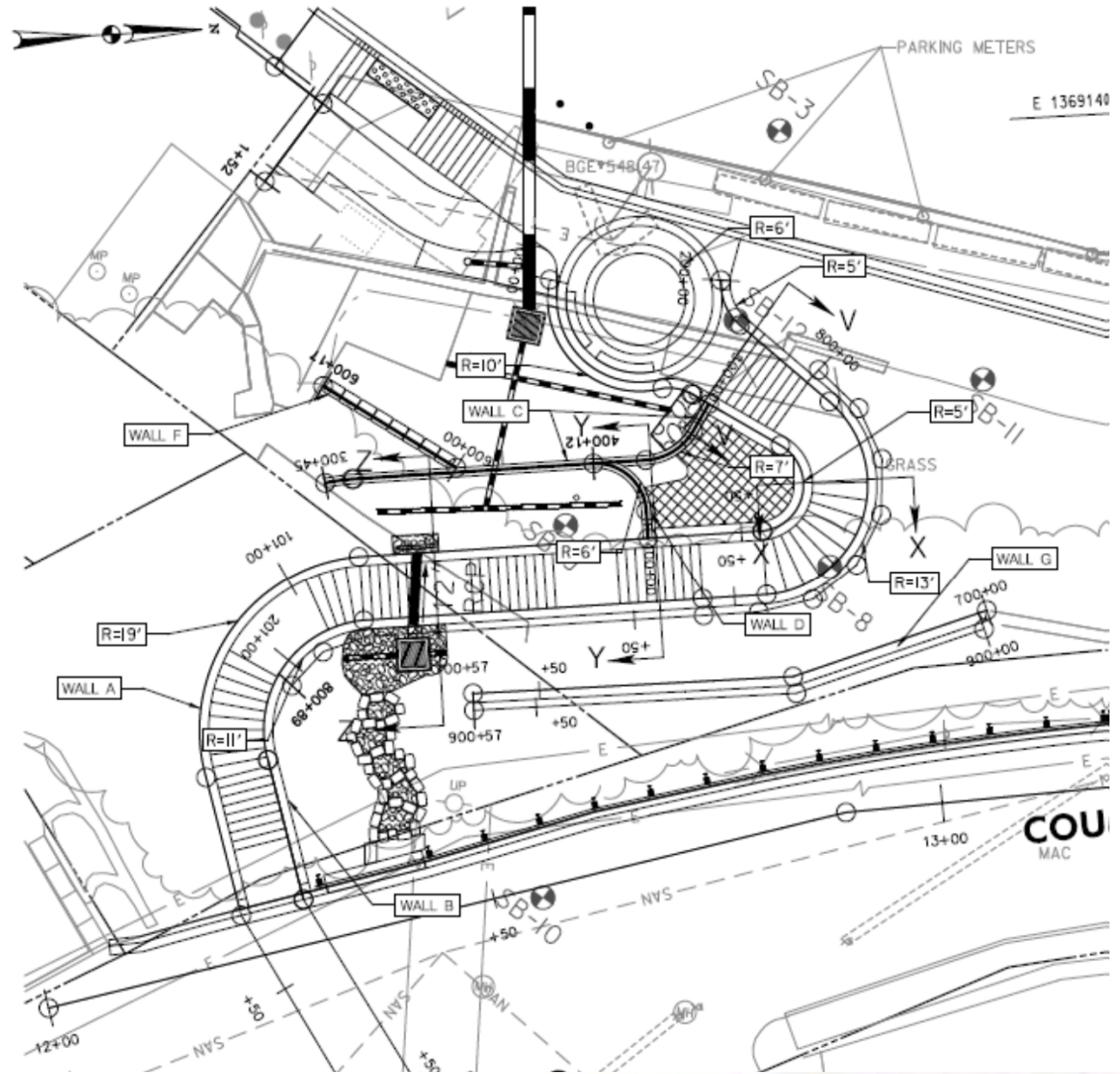
- Turn entrance into 'plaza' area adjacent to restaurant
- Several Parking Layouts
- 'Tiered' water quality along slope...

...but how to address grading to create storage?



Project Concept

- Utilize Retaining Walls to capture and store runoff
- Step pools from upper roadway inlet – captures runoff from Courthouse area
- Pipe under stairs, drop into first of two bioretention BMPs



Concept Rendering



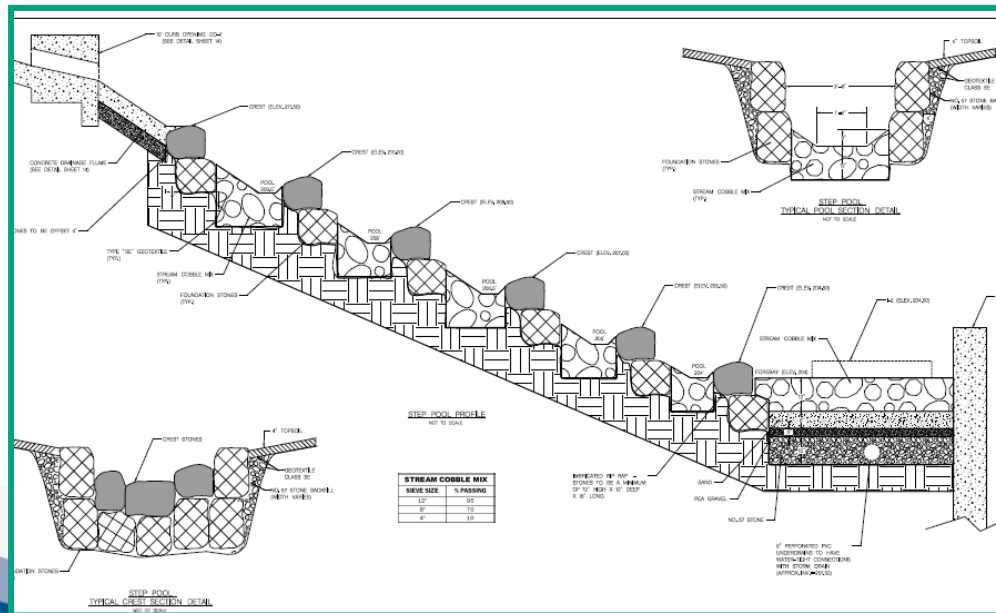
Site Layout



(Google Maps 3D)

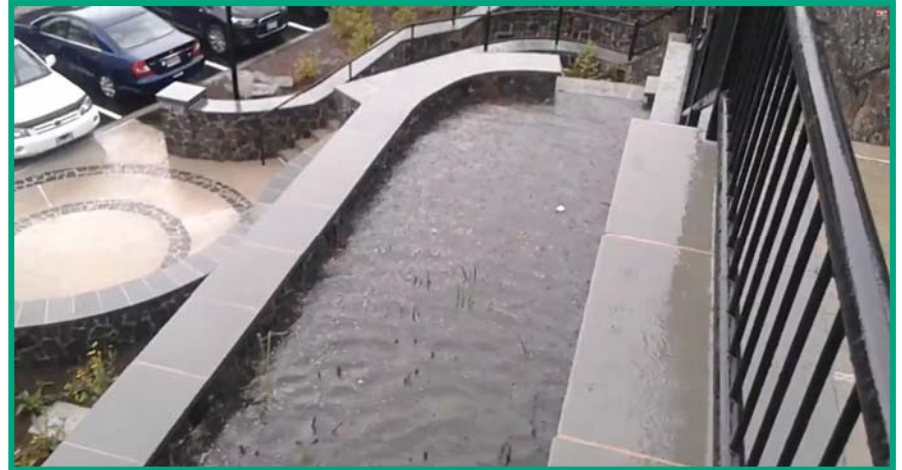
Staircase BMP

- Top Stage
 - Capture initial flow from Courthouse Area
 - Step pool to forebay inlet
 - Work around anchor wire



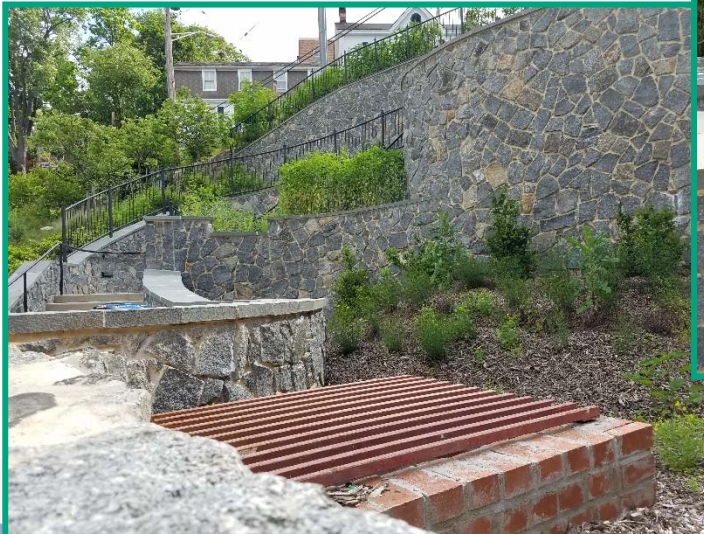
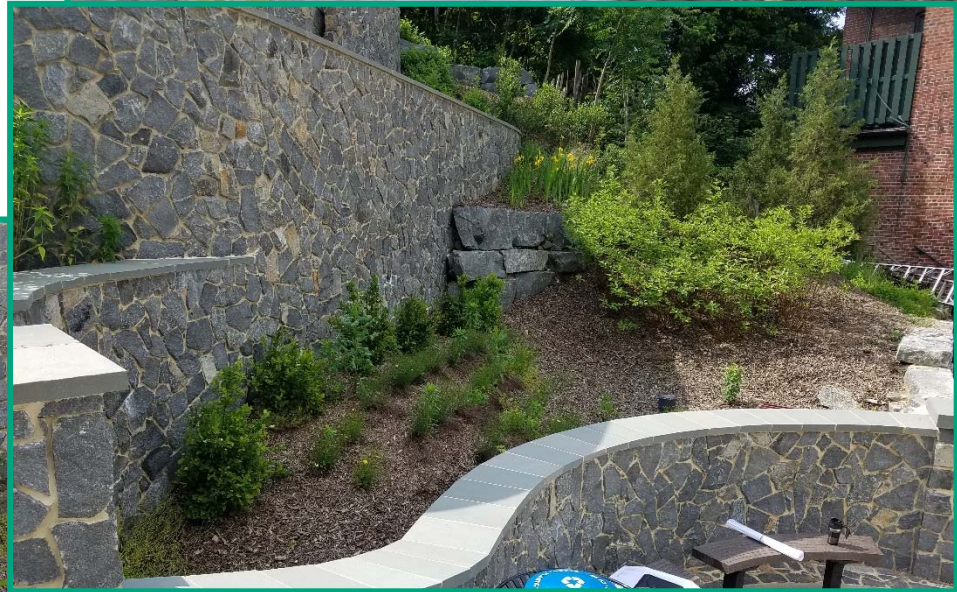
Staircase BMP

- First Bioretention
 - Pipe from forebay hits panel and drops down
 - Overflow goes into “turn channel”



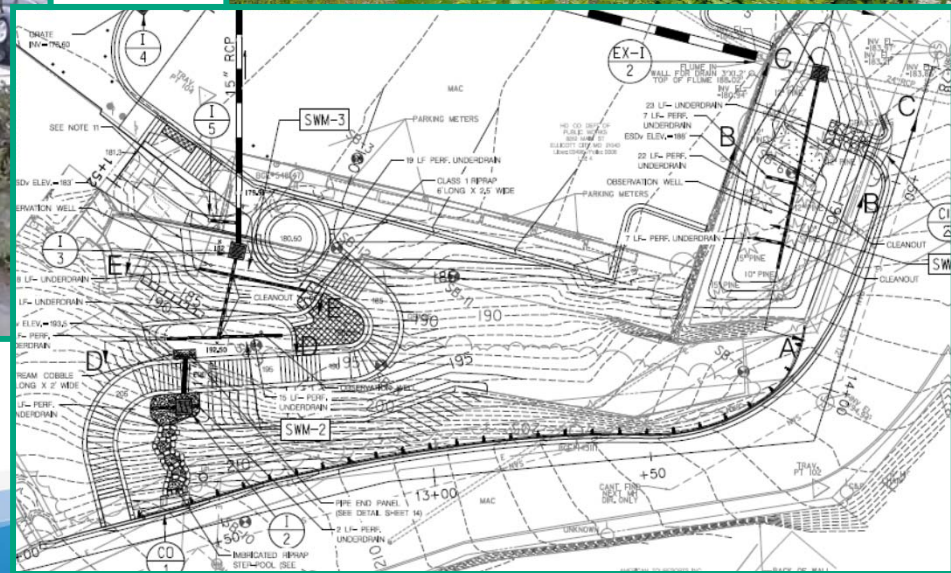
Staircase BMP

- Second Bioretention
 - Receives flow from “turn channel”
 - Collects underdrains from above, ties into lot storm drain



Terrace BMP

- Receives Bypass Flow, Court Ave
 - Set behind wall at north end of lot
 - Overflow into forebay inlet
 - Additional weir onto lot above inlet



Filterra™ Tree Box

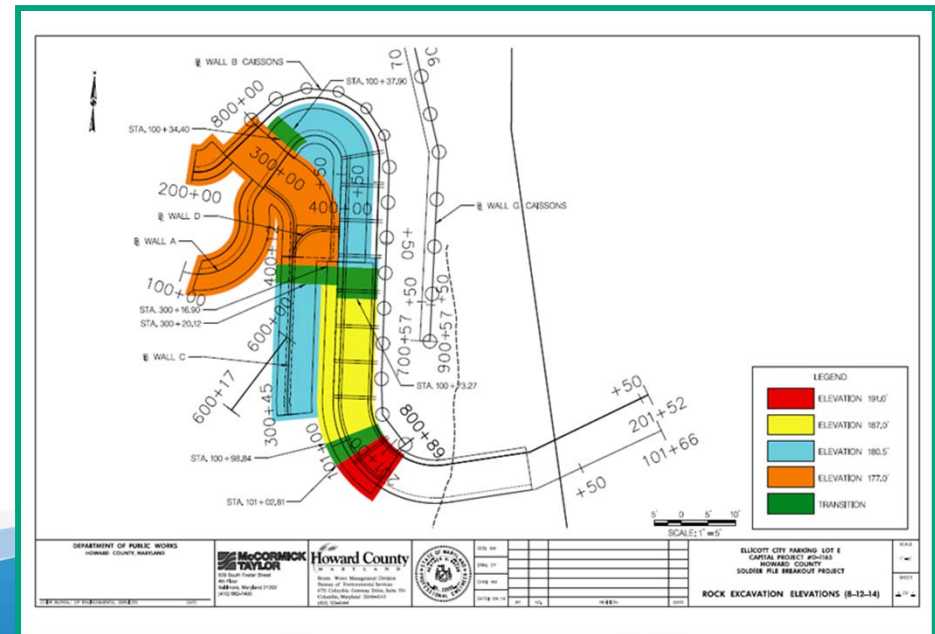
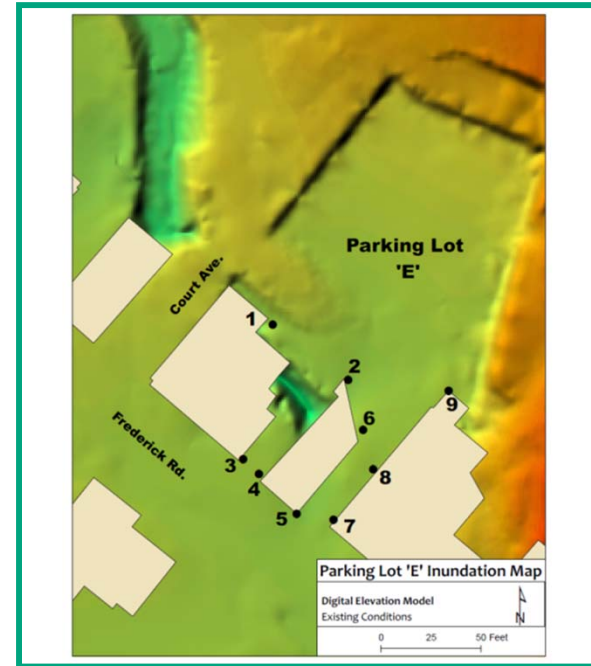
- Receives Flow from Lot
 - Bioretention option too close to existing house
 - Filterra in plaza area



(Google Maps 3D)

Unique Design Challenges

- Physical site constraints
 - Bedrock
 - Steep existing slopes
 - Impacts to Court Ave
 - Historic, existing infrastructure
 - Stream / 100-yr floodplain
- Permitting with 2D model
- Historic District Commission coordination
- Phasing project using multiple contractors for different phases



Construction Challenges

- Expedited Timeline (Multiple Contractors)
 - Design: September 2013
 - Phase 1 Construction: May 2014 - September 2014
 - Phase 2 Construction: September 2014 – August 2015
 - Wall Collapse
 - Aging Infrastructure
 - Business Delivery Coordination



Wall Failure



(Google Maps 3D)

Structural

- Staircase/retaining walls
 - Phase 1 – Concrete caisson and soldier pile installation
 - Phase 2 – Concrete staircase and spread footer retaining walls
 - Large outcroppings of bedrock → Major rock excavation operation



Structural



Structural



Structural



Structural



Structural

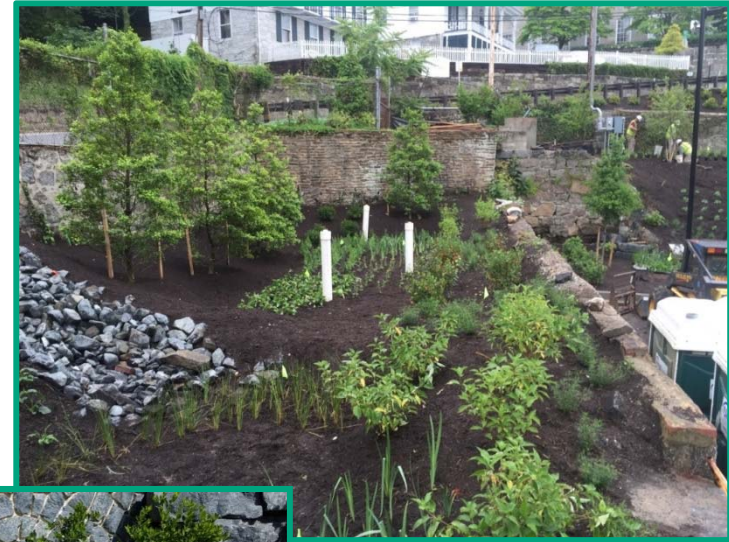


Structural



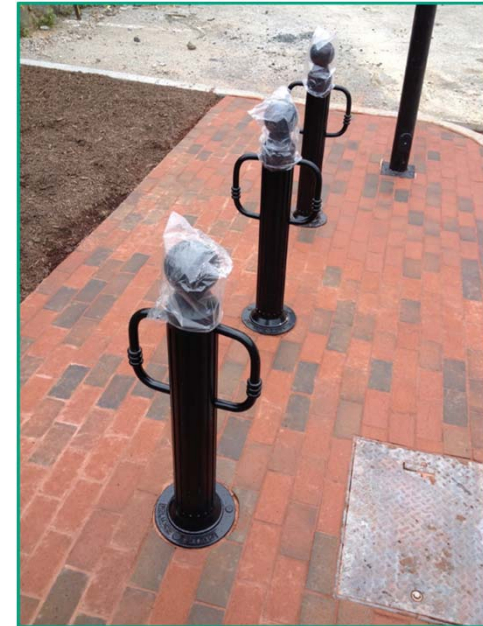
Landscaping

- Selection of native plants
- Salvaged stone materials
- Visual screening



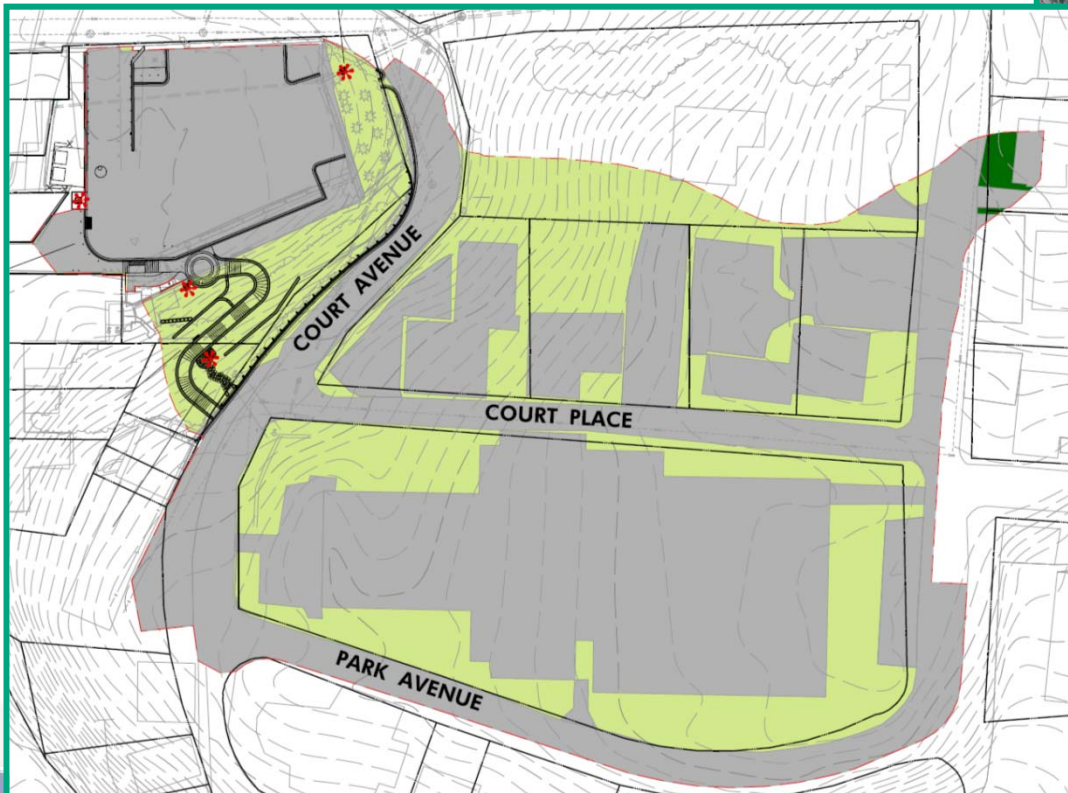
Hardscaping

- Used salvaged stone where possible (from failed wall)
- All architectural elements approved by Ellicott City HDC

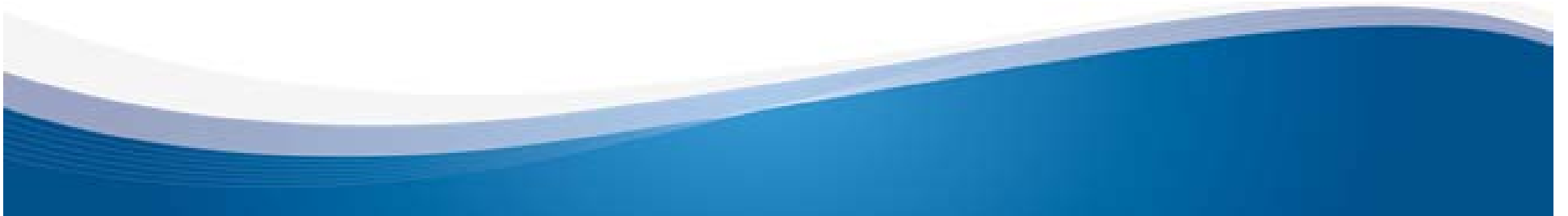


Water Quality Treatment

- Rooftop and pavement from courthouse area + majority of Lot E
- 2.72 Ac of impervious area



Site Evolution





Site Evolution



Questions?

