



City of Columbia BMP Manual

User Fee Credits and Summary of Previous Meetings

August 21, 2013



Today's Agenda



- Welcome
- User Fee Credits
- Summary of Previous Meetings
- Questions
- Adjourn



User Fee Credits



- City of Columbia's Stormwater Utility Fee provides funding for stormwater related activities including:
 - Designing and constructing capital improvement drainage projects
 - Routine cleaning, maintenance and repair of City's stormwater drainage system
 - Developing an inventory of the City's stormwater drainage system
 - Master planning for capital improvement projects
 - Complying with the City's MS4 Permit and stormwater quality requirements

User Fee Credits



- Property Fee Categories:

- Undeveloped or no-bill properties (no user fee)
 - Undeveloped properties with less than 600 ft² of impervious area
- Single-family residential (flat rate fee of \$6.80 / month)
 - All properties with a single-family home, duplex, patio home, or mobile home
- Non-single-family residential (user fee based on impervious area)
 - All developed properties not classified as single-family residential, including:
 - » Apartments
 - » Commercial or office buildings
 - » Public buildings
 - » Industrial and manufacturing buildings
 - » Storage buildings and storage areas with impervious surfaces
 - » Parking lots
 - » Recreational properties
 - » Public and private schools
 - » Etc.

User Fee Credits



- Non-Single-Family Residential user fee calculation:
 - Determine the amount of impervious area
 - Convert impervious area into Equivalent Residential Units (ERU's)
 - 1 ERU = 2,454 ft²
 - Round up to the nearest whole number
 - Multiply the number of ERU's by \$6.80 to calculate total user fee

Non-Single Family Residential Example

For property with 100,000 ft² of impervious area:

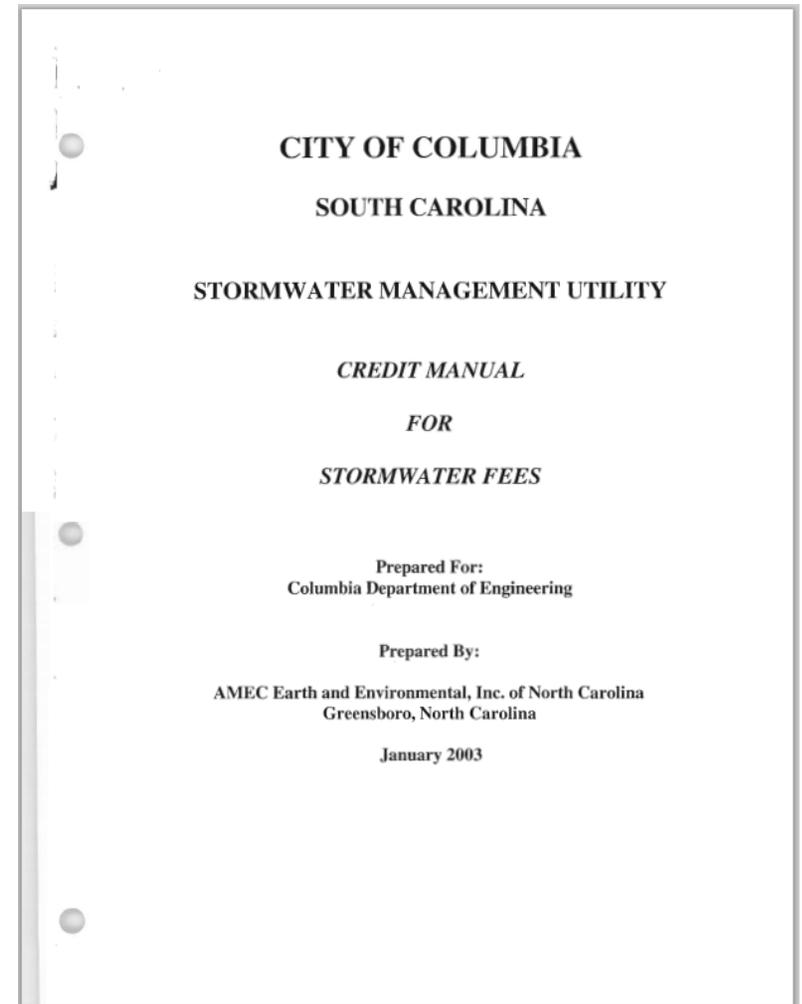
$$\begin{aligned} \text{Number of ERUs} &= \frac{100,000 \text{ ft}^2}{2,454 \text{ ft}^2} \\ &= 40.7 \text{ ERUs (round up)} \\ &= \mathbf{41 \text{ ERUs}} \end{aligned}$$

$$\begin{aligned} \text{Stormwater Fee} &= 41 \times \$6.80 \text{ per month} \\ &= \mathbf{\$278.80 \text{ per month}} \end{aligned}$$

User Fee Credits



- **Current Stormwater Credit Manual**
 - Only for Non-single-family residential
 - **Detention / Retention Credit**
 - 20% credit for detaining the 10-year storm event
 - 40% credit for detaining the 25-year storm event
 - 60% credit for detaining the 100-year storm event
 - **Education Credit**
 - Credits up to 20 are available to educational institutions for educating their students about the importance of surface and groundwater resources
 - **Certain basic conditions must be met:**
 - Maintenance agreement
 - Proper maintenance
 - Engineer's certification



User Fee Credits



- Water Quality Volume Reduction = User Fee Credit
 - Calculate the WQ_v that is addressed by the site, based on the USC Methodology
 - Convert the WQ_v to an area by dividing the WQ_v by the water quality rainfall depth of 1.2 inches. This is the area of which water quality impacts will be fully mitigated (by infiltration and/or filtration) – this will be referred to as the WQ_v Impervious Reduction (IR)
 - Identify the amount of physical imperviousness that the site contains, which the User Fee would be based on – this will be referred to as the Impervious Area (IA)
 - Compare the IR and IA values and generate a % Reduction that is applied to the fee (i.e. $IR/IA = \% \text{ Reduction}$). The % Reduction should be rounded to the nearest whole number. User fee crediting will be capped at a maximum % Reduction of 30%
 - Multiply the % Reduction by the User Fee (based on IA) to calculate the final amount of the User Fee

Summary of Previous Meetings



- **Meeting 1:** December 19, 2012 – Project Overview and Goals
- **Meeting 2:** January 16, 2013 – Unified Sizing Criteria Method
- **Meeting 3:** February 13, 2013 – Better Site Planning / Design & Volume Reduction
- **Meeting 4:** March 20, 2013 – Applying Better Site Crediting & BMP Sizing
- **Meeting 5:** April 17, 2013 – Detailed Unified Sizing Criteria Example Wet Pond Design
- **Meeting 6:** May 15, 2013 – Bioretention and Vegetated Filter Strips
- **Meeting 7:** June 19, 2013 – Plan Review, Inspection, and Maintenance of BMP's and LID Features
- **Meeting 8:** July 24, 2013 – Volume Calculation Tool and Examples
- **Meeting 9:** August 21, 2013 – User Fee Credits and Summary of Previous Meetings

Meeting 1: December 19, 2012

Project Overview and Goals



- Goals of BMP Manual
 - MS4 Requirements, SWMP Ordinance, Engineering Regs, Zoning, construction & post-construction, ease of use, efficiency, communication
- AMEC's Scope
 - BMP Manual
 - Monthly Meetings
 - Design Aids
- Key issues
 - Designer's consistency vs. creativity
 - City guidance vs. designer's freedom
 - Balancing design, functions, and maintenance
 - Available credits: volume vs. user fee
 - Public communication forum
- Limitations

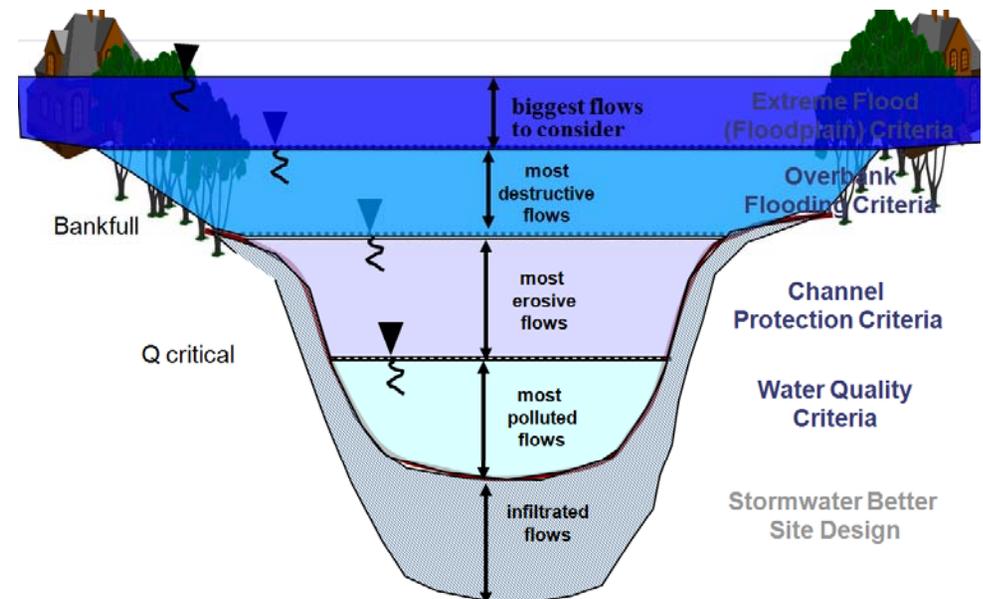


Meeting 2: January 16, 2013

Unified Sizing Criteria Method



- Unified Sizing Criteria
 - Water Quality Volume
 - Channel Protection Volume
 - Overbank Flood Protection
 - Extreme Flood Protection
- Structural Stormwater Controls
 - Treat stormwater runoff
 - Mitigate effects of increased:
 - Peak flow rate
 - Volume
 - Velocity



Meeting 3: February 13, 2013

Better Site Planning / Design & Volume Reduction



■ Stormwater Better Site Design Practices

- Less impervious cover
- Conserve natural areas
- Minimize stormwater pollution
- Reduce construction costs
- Increase property values
- Naturally attractive landscape

■ Better Site Design Credits

- Natural area conservation
- Stream buffers
- Vegetated channels
- Overland flow filtration infiltration

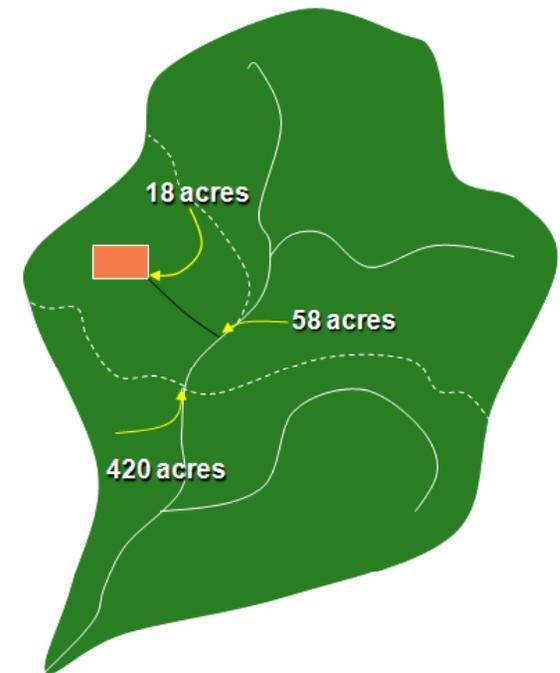
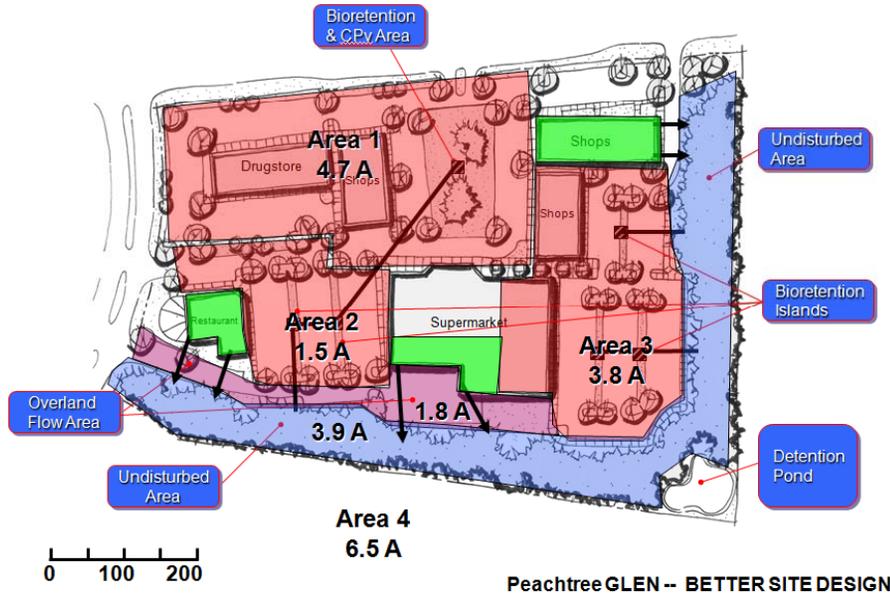


Meeting 4: March 20, 2013

Applying Better Site Crediting & BMP Sizing



- Design Process with USC
- Using Better Site Design and taking credit
- Selecting BMP's
- Downstream Assessment

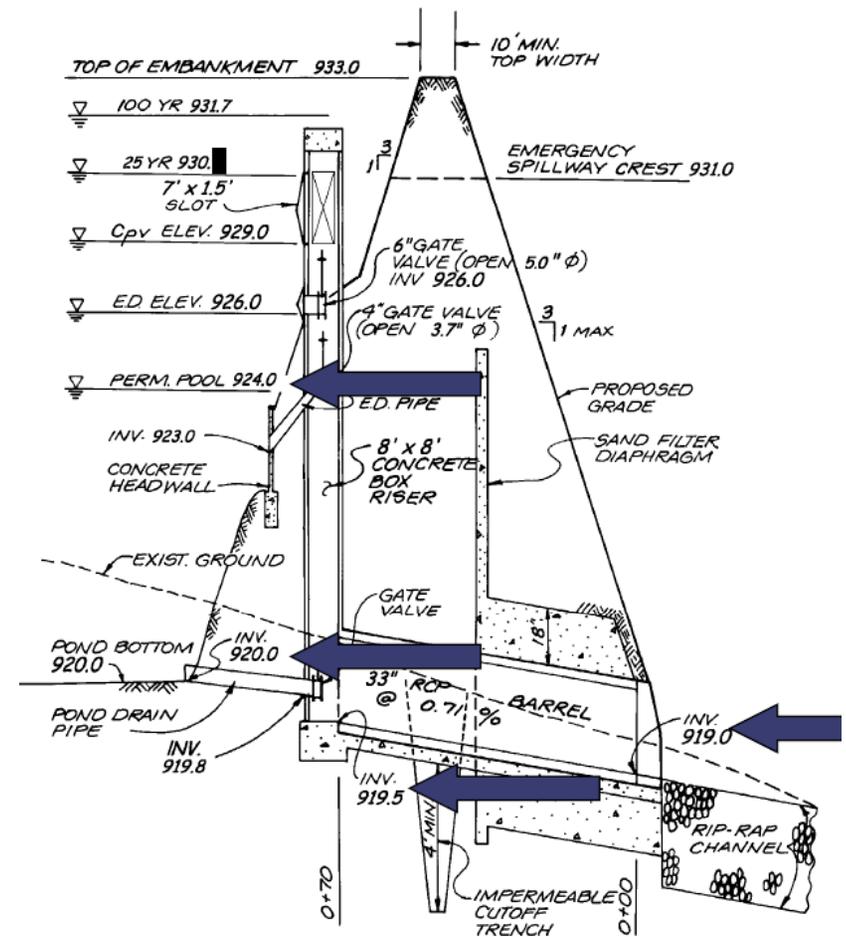
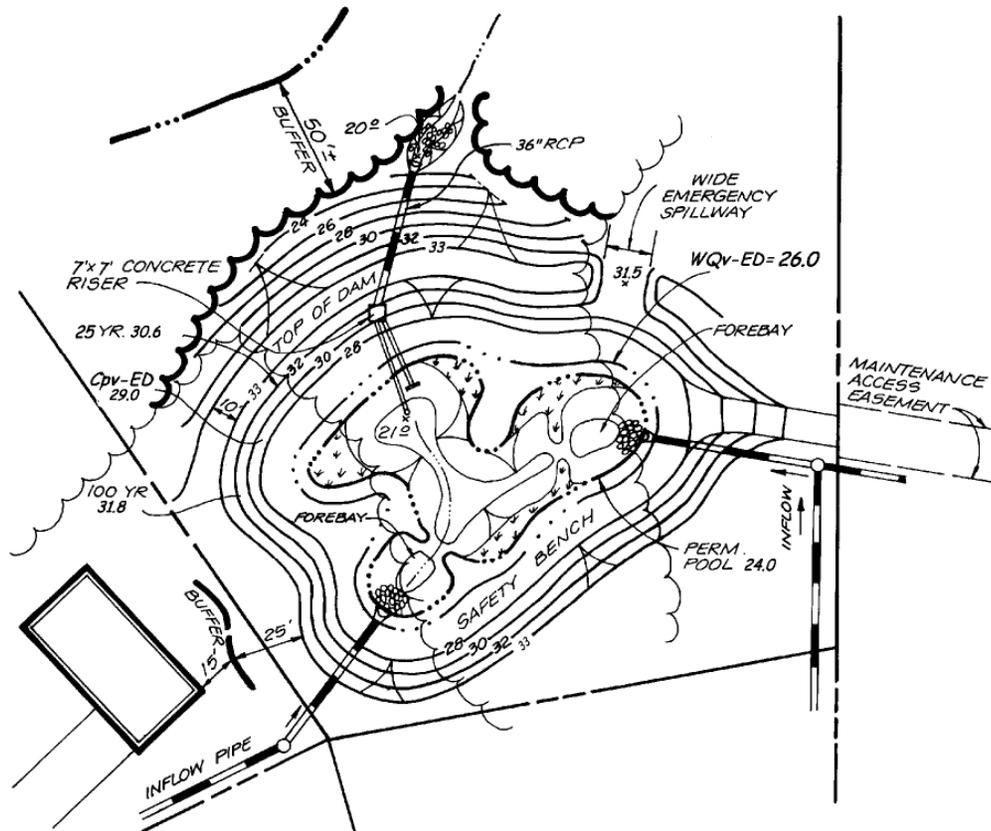


Meeting 5: April 17, 2013

Detailed Unified Sizing Criteria Example Wet Pond Design



- Example Wet Pond Design using USC

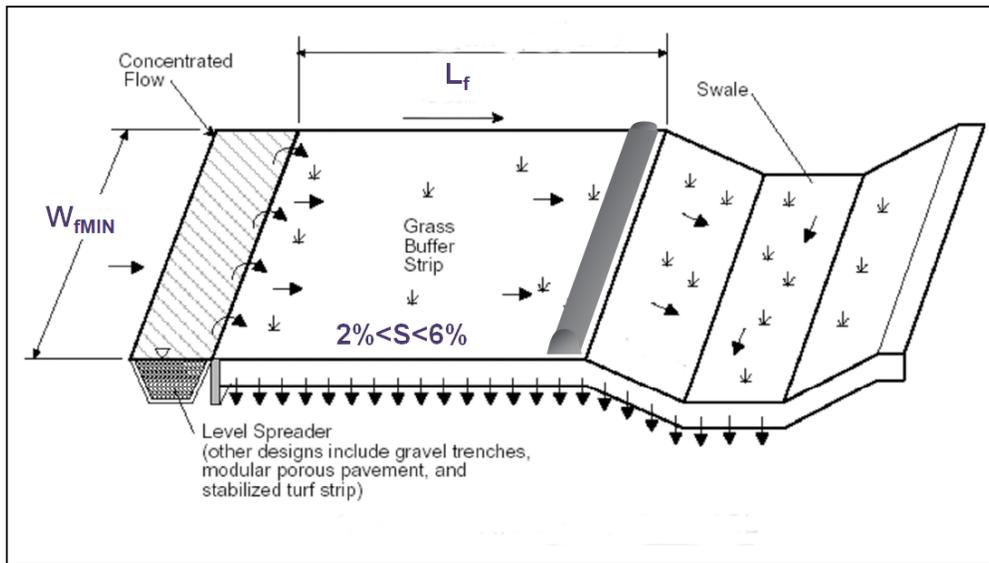


Meeting 6: May 15, 2013

Bioretention and Vegetated Filter Strips



- Design of Bioretention and Vegetated Filter Strips

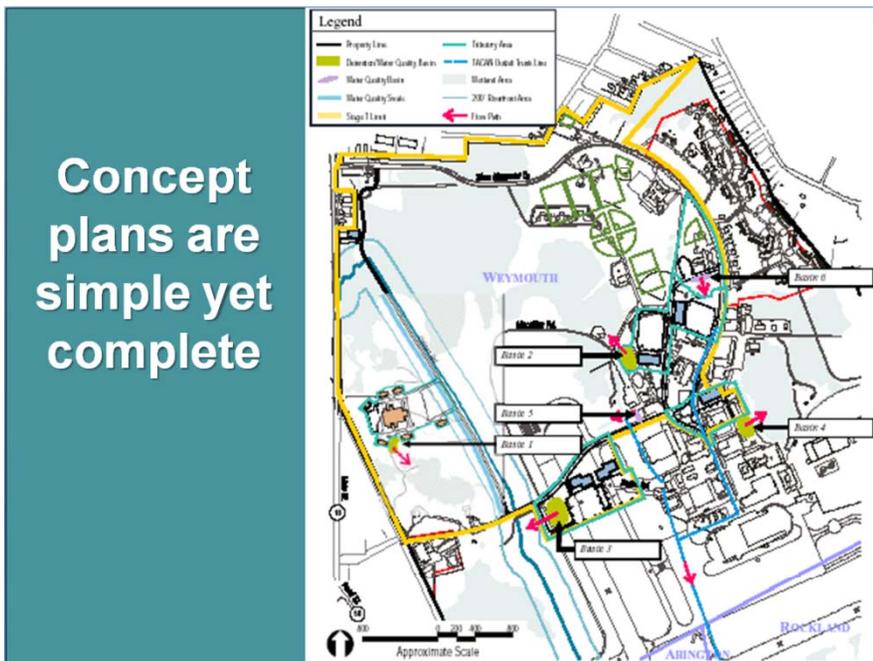


Meeting 7: June 19, 2013

Plan Review, Inspection, and Maintenance of BMP's and LID Features



- Initial Meetings with the City
- Concept Plan
- SWPPP's
- BMP Maintenance



Bioretention: Inspection & Maintenance Requirements

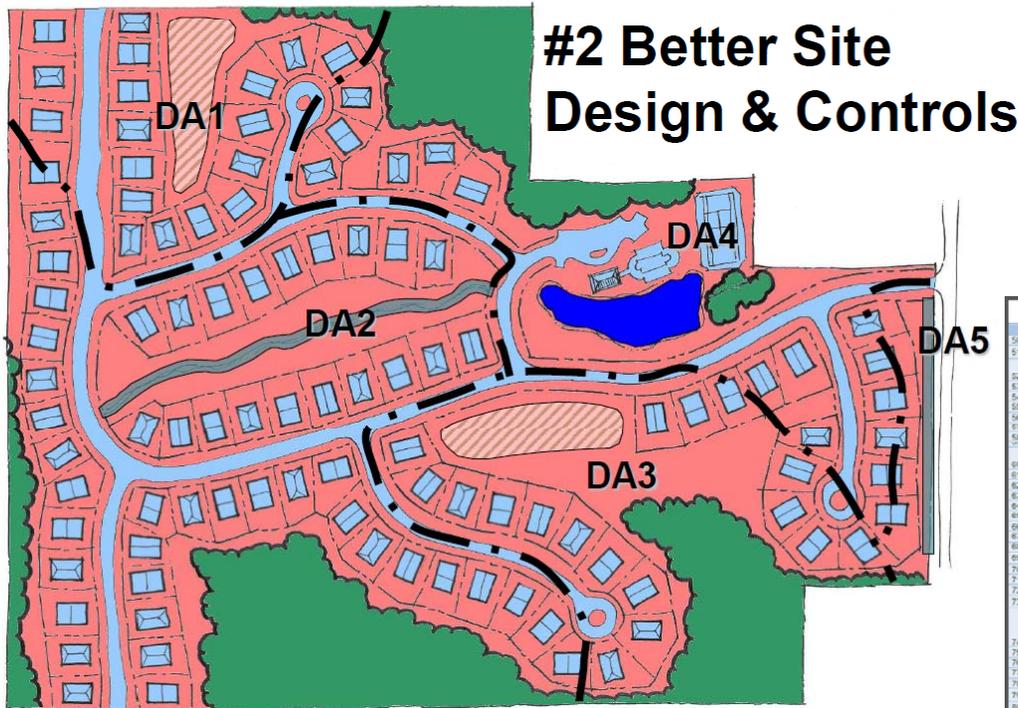
Activity	Schedule
<ul style="list-style-type: none"> Pruning and weeding to maintain appearance. Mulch replacement when erosion is evident. Remove trash and debris. 	As needed
<ul style="list-style-type: none"> Inspect inflow points for clogging (off-line systems). Remove any sediment. Inspect filter strip/grass channel for erosion or gullyng. Re-seed or sod as necessary. Trees and shrubs should be inspected to evaluate their health and remove any dead or severely diseased vegetation. 	Semi-annually
<ul style="list-style-type: none"> The planting soils should be tested for pH to establish acidic levels. If the pH is below 5.2, limestone should be applied. If the pH is above 7.0 to 8.0, then iron sulfate plus sulfur can be added to reduce the pH. 	Annually
<ul style="list-style-type: none"> Replace mulch over the entire area. Replace pea gravel diaphragm if warranted. 	2 to 3 years

Meeting 8: July 24, 2013

Volume Calculation Tool and Examples



- Example project using City's Design Aid Tools



#2 Better Site Design & Controls

RESIDENTIAL SUBDIVISION -- BETTER SITE DESIGN

#2 BSD & BMPs 'DA1 thru DA4'

Structural BMPs	WQv Credit (cf)	Applicable BSD Credits to Adjust Site's CN				
51						
52 Credited Practices in CoC BMP Manual						
53 Bioretention Area	24,430	Conservation Areas 16,638 cf				
54 Infiltration Trench		Storm Buffers 0 cf				
55 Grass Filter Strip		Grass Filter Strips 0 cf				
56 Dry Swale	11,200					
57 Porous Surfaces						
58						
59						
60 Credited Practices for Other Accepted Structural BMPs		Applicable BMP Credits to Adjust Site's CN				
61 Overlands		Bioretention 24,430 cf				
62 Wet Swale		Infiltration Trench 0 cf				
63 Gravity Separator		Porous Surfaces 0 cf				
64 Commercial Dry Control		Dry Swale 11,200 cf				
65 Multi-Purpose Detention Area		Rain Gardens/Catchment 0 cf				
66 Underground Detention		Runoff Reduction 0 cf				
67 Rain Garden/Catchment		Vol. Adjustment (BSD + BMP) 46,181 cf				
68		Adjusted CN _{post} 80				
69	35,642					
70						
71						
72						
73						
Pre vs. Post Drainage Area Summary						
	Total Drainage Area (acres)	Imperv. Area (acres)	IC (min)			
74	80.84	16.71	82			
75	80.84	16.71	81			
76	80.84	16.71	80			
77	80.84	16.71	80			
78						
Pre vs. Post Peak Flow Summary						
	Q _{10yr} (cfs)	1st Int'l.	2yr Int'l.	10yr	25yr Int'l.	100yr
80	N/A	77.4	90.4	172.2	202.1	287.4
81	Post Development	74.0	86.0	161.5	197.2	262.0
82	Post Dev. with BSD & BMPs	70.9	83.3	160.9	196.3	256.6
83						
Pre vs. Post Volume Summary						
	WQv (cf)	CPv (cf)	2yr Int'l.	10yr Int'l.	25yr Int'l.	100yr Int'l.
86	85,116	301,365	141,814	224,830	288,971	341,033
87	Post Development	60,970	200,579	131,622	221,039	255,404
88	Post Dev. with BSD & BMPs	12,805	47,750	105,160	139,239	141,908
89	% Reduction w. BSD & BMPs	85.57	8.48	15.64	10.78	15.01
90						8.72
91						
92						
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102						

% Volume Reduction Utilizing BSD & BMPs:

	WQv	CPv	2yr	10yr	25yr	100yr
% Red. w. BSD & BMPs	60.37	8.5	13.8	10.8	10.0	8.7

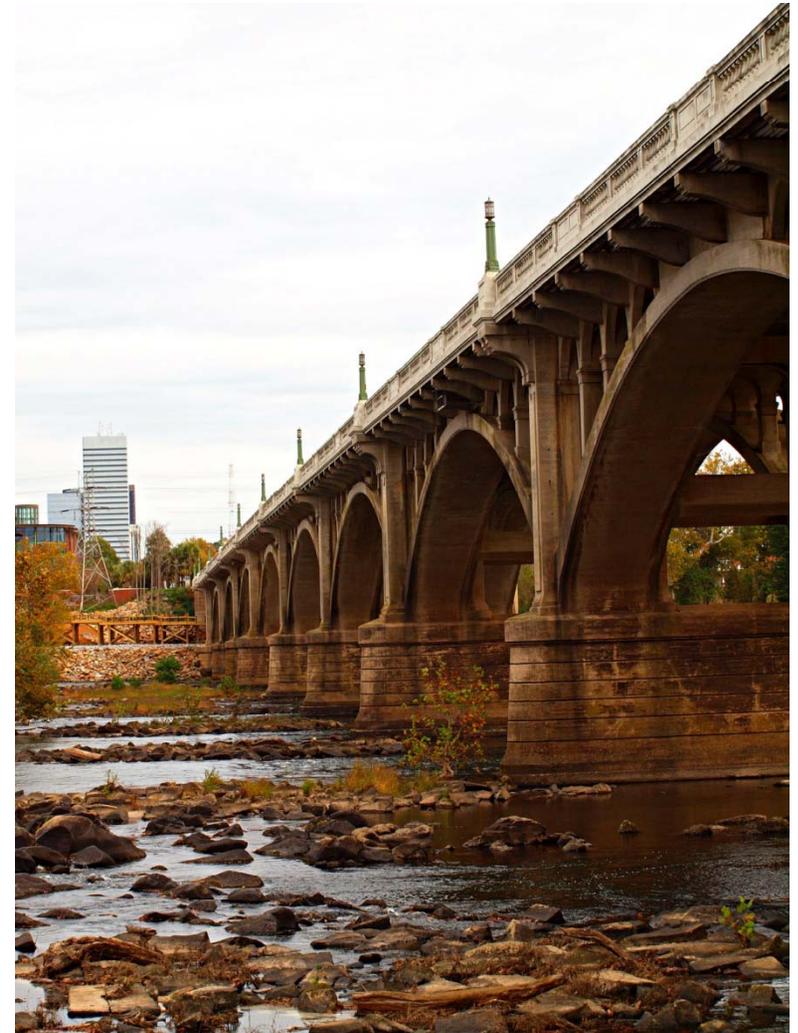
Annotations:

- Input DA1 and DA3's Bioretention Cells' Storage Volumes (from CoC's Sizing Tools)
- Input DA2's Dry Enhanced Swale Storage Volume (from CoC's Sizing Tools)
- Enough infiltration from bioretention cell to lower site's CN from 82 to 80
- Summary of Pre Dev vs. Post Dev with BSD vs. Post Dev with BSD & BMPs:
 - Peak Flows
 - Storage Volumes

What's Next?



- Address outstanding comments
- Finalize BMP Manual, Design Spreadsheets, and BMP Details
- Approval by City Council



Questions?

