Stormwater Design Standards Manual
Educational Workshop #1:

Submittal, Permitting and Closeout Process
&
Conceptual Planning for Stormwater and Low Impact Development

28 May 2020
Agenda

- General Manual Information
- Specific Workshop Information
- General Public Q&A
- Technical Information
  - City Stormwater Permitting Submittal, Permitting and Closeout Process
  - Conceptual Planning for Low Impact Development and Stormwater
- Technical Q&A
General Manual Information

• Stormwater Design Standards Manual (SWDSM) is a federally mandated requirement of the National Pollution Discharge Elimination System (NPDES) Phase II Stormwater Program

• SWDSM is used by design community to develop designs and used by the City to review, approving, and permitting designs.

• SWDSM has 8 chapters:
  1. Introduction and Legal Authority
  2. Conceptual Overview
  3. Design Requirements
  4. Construction Activity Permitting
  5. Construction Phase
  6. Post-Construction
  7. City Inspection and Enforcement
  8. References

• Originally passed in 2007, first update was completed in 2013

• Newest update goes into effect July 1, 2020
Specific Workshop Information

• Permitting Process
  – National Pollution Discharge Elimination System (NPDES)
  – City of Charleston Technical Review Committee (TRC)
  – Citizen Access Portal (CAP)
  – Submittal, Review, Revision/Resubmittal, Approval

• Construction Activities
• Post-Construction
• Conceptual Planning for Stormwater and Low Impact Development (LID)
General Public Q&A
City Process

Educational Memorandum #1

- Permitting Process
  - TRC versus non-TRC Submittals
  - Submittal
  - Technical Review Committee Application
  - Construction Activity Application
  - Exemptions and Design Exceptions
  - Fees
  - Citizen Access Portal
  - City Review
  - Revision/Resubmittal
  - Approval

- Construction Activity
  - Pre-Construction
  - Construction
  - Notifications

- Post-Construction Activity

- Warranty
City Process
Educational Memorandum #1

Application → Submittal → Review/Revisit/Resubmit → CAA/MS4 Approval → Construction Activity → Post-Construction Activity
Permitting Process: Application – City Review Tracks

- Any new construction or renovation resulting in the addition of 2,000 sq. ft. or more of space to an existing structure
- Any new construction in excess of 500 sq. ft.
- Developments requiring Subdivision Approval

- Technical Review Committee Track Projects
  - TRC approval required by the zoning classification of a given site
  - Site Plan review required by restrictive covenants applicable to a given site

- Developments requiring Planned Unit Development Master Plan Approval
  - Single-family or two-family dwelling unit construction resulting in a total of four or more units on a single lot

- Single-family or two-family dwelling unit construction resulting in a total of three or fewer units on a lot
  - Parking lots that are less than 5,000 sq. ft.
    - *Does require review by ADA

- Non-Technical Review Committee Track Projects
  - Routine repairs and maintenance of existing structures

- Small storage structures or garages not exceeding 500 square feet

Submitted to the Zoning Division

Submitted to the Department of Stormwater Management
Permitting Process: Application - TRC

- TRC categorizes projects as *Site Plan* or *Subdivision*


*Please note that the TRC Manual was last updated in 2017 – any Stormwater Chapter References are for the 2013 SWDSM not the 2020 SWDSM*
Permitting Process:
Complete Construction Activity Applications

**Single Family Residential**
- Complete Building Permit Application
- EPSC Certification Form

**Small Construction Activity (Type I)**
- Type I Application Form
- EPSC Certification Form
- Completed Type I Guidelines and Checklist (with applicable documentation)
- Additional Permits (if required)

**Medium Construction Activity (Type II)**
- Type II Application Form
- Completed Type II Guidelines and Checklist (with applicable documentation)
- Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP)
- Stormwater Technical Report
- Construction Plans
- USACE Wetland Jurisdictional Determination
- Additional Permits (if required)

**Large Construction Activity (Type III)**
- Type III Application Form
- Completed Type III Guidelines and Checklist (with applicable documentation)
- C-SWPPP
- Stormwater Technical Report
- Construction Plans
- Stormwater Masterplan
- Phased EPSC Plan
- USACE Wetland Jurisdictional Determination
- Additional Permits (if required)
- Pre-submittal Meeting is required with TRC

**Linear/Utility Applications**
- Application for Small Construction Activities and Utility/Linear Projects Form

Pre-submittal Meeting is required with TRC
Permitting Process: Exemptions and Design Exceptions

• Previously known as Variances
• Exemption: the modification of the minimum stormwater management requirements contained in Chapter 27 of the City of Charleston Ordinance and the Stormwater Management Program for specific circumstances where strict adherence to the requirements would result in unnecessary hardship and not fulfill the intent of Chapter 27 of the City of Charleston Ordinance.
• Requires written request with specific exception sought, supporting data, reasons the exemption should be granted
• If more exemptions are required – additional written requests are required
• For Example: Equalization Pipes and Submerged Systems require an exception
  – Design Requirements SWDSM Section 3.4.6.1.4
  – Exception Procedure SWDSM Section 4.10
Permitting Process: Fees

- All fees are paid to the City by the Permittee

<table>
<thead>
<tr>
<th>Fee</th>
<th>Criteria</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Activity Plan Review*</td>
<td>Single Family Residential with &lt; 0.5 acres of disturbance</td>
<td>$100</td>
</tr>
<tr>
<td></td>
<td>All other submittals</td>
<td>$500 + $200 per disturbed acre ($5,000 maximum)</td>
</tr>
<tr>
<td>Inspection**</td>
<td>&lt; 1 acre</td>
<td>$75</td>
</tr>
<tr>
<td></td>
<td>1 – 5 acres</td>
<td>$150</td>
</tr>
<tr>
<td></td>
<td>5.01 – 10 acres</td>
<td>$250</td>
</tr>
<tr>
<td></td>
<td>&gt; 10 acres</td>
<td>$500</td>
</tr>
<tr>
<td>Transfer</td>
<td>Per Property Owner Transaction</td>
<td>$100</td>
</tr>
</tbody>
</table>

* Covers the initial inspection and 2 re-inspections
+ Construction Activity Plan Review and Inspection Fees will increase effective July 1st
Permitting Process: Citizen Access Portal

• Application packages will be uploaded online and distributed to appropriate departments once CAP is fully implemented.
• Comments and Approvals communicated through online portal.
• Applicants must be registered.
• Website: https://cap.charleston-sc.gov/energov_prod/citizenaccess/site/public/main
Permitting Process: TRC & Non-TRC Submittals

• TRC Track Submittal – Route to the Zoning Division
  — Email: Scott Valentine: valentines@charleston-sc.gov
  — https://www.charleston-sc.gov/298/Technical-Review-Committee-TRC

• Non-TRC Track Submittal – Route to the Department of Stormwater Management
  — Email: Annie Mitchell: mitchellan@charleston-sc.gov
Permitting Process: Technical Review Committee

• Reviews Site Plans and Subdivisions for compliance with City codes, regulations, and laws
• Multiple City Departments are involved – beneficial to be well coordinated to avoid confusion and delay
Permitting Process: Non-TRC Reviews

• Non-TRC Review
  – Reviewed by the Department of Stormwater Management, Public Service Department/Engineering Division, and Zoning Division as part of a Construction Activity Application package submittal
  – Typically Linear/Utility Projects
Permitting Process: Revision/Resubmittal

• Revision and Resubmittal will have to be done for:
  – Review Comments
  – Requests for Additional Information are Required
  – Denial Issued
• City will issue a letter detailing the comments, requests, or reasons for denial
• Applicant will submit response to comments letter
  – If a meeting is required, the meeting must be scheduled and attended prior to submitting the reply letter
• Process will repeat until all comments and requests for needed information have been received by the City
Permitting Process: Application Approval

- Approval is granted after all requested information is submitted by the applicant.
- An CAA/MS4 Approval Letter will be forwarded to the South Carolina Department of Health & Environmental Control (SCDHEC).
- Approval remains valid for five (5) years after issued date.
  - Construction must be initiated within twelve (12) months of issued date or approval will be invalid at the end of the twelfth month.
Permitting Process: Changes After Approval

• Changes after Approval qualifiers:
  – Revisions made to approved plans and/or construction documents
  – Transferring construction activity responsibility

• Major Modifications/Revisions made to approved design must be submitted to the City in writing

• Revisions include:
  – Pipe size and grade alterations affecting hydraulic capacity
  – Easement boundary changes due to change in stormwater system components
  – Changes in general grading plan that affect flow direction, rate, volume, or quality of runoff
Construction Activity: Pre-Construction

- Process begins after all Permits are in hand and NPDES coverage has been granted by SCDHEC
- NPDES Pre-Construction Meeting (Section 4.1.C of the Construction General Permit)

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Requirements</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-linear</td>
<td>Disturb &lt; 10 acres</td>
<td>May be held off-site</td>
</tr>
<tr>
<td></td>
<td>Disturb ≥ 10 acres</td>
<td>On-site</td>
</tr>
<tr>
<td>Linear</td>
<td>Not part of a Larger Common Plan</td>
<td>May be held off-site</td>
</tr>
<tr>
<td></td>
<td>Part of a Larger Common Plan and &lt;10 acres</td>
<td>May be held off-site</td>
</tr>
<tr>
<td></td>
<td>Part of a Larger Common Plan and ≥ 10 acres</td>
<td>On-site</td>
</tr>
</tbody>
</table>

- TRC Pre-Construction Meeting (not required for Non-TRC track)
- After tree protection and initial EPSC BMP installations have been inspected and approved, the City will issue CAA approval and construction can begin
Construction Activity: Construction

- EPSC BMPs shall be maintained throughout the entirety of construction in accordance with the On-site Stormwater Pollution Prevention Plan (OS-SWPPP)
- Applicant/Owner/Permittee must conduct weekly SWPPP inspections and maintain these records as part of the OS-SWPPP
- Inspections must be conducted at least once every calendar week with no time period between inspections exceeding 9 days
- Final site stabilization and inspection – close-out can begin after City approval
Construction Activity: Notifications

- The applicant/owner should notify the City based on the occurrence as follows:

<table>
<thead>
<tr>
<th>Occurrence</th>
<th>Contact</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modifications to the construction sequence or timeframe</td>
<td>Onsite personnel</td>
<td>Immediately</td>
</tr>
<tr>
<td>Major modifications to the approved design or SWPPP</td>
<td>City and SCDHEC</td>
<td>Prior to Implementing modification</td>
</tr>
<tr>
<td>Transfer of responsibility</td>
<td>City and SCDHEC</td>
<td>14 calendar days</td>
</tr>
<tr>
<td>Dangerous spills or leaks</td>
<td>Minor: Onsite personnel Major: Contact 911 or local emergency response team</td>
<td>Immediately</td>
</tr>
<tr>
<td>Illicit discharge(s)</td>
<td>City</td>
<td>24 hours</td>
</tr>
<tr>
<td>Inspection reports</td>
<td>Personnel responsible for EPSC maintenance</td>
<td>Notify immediately, seven days to perform maintenance</td>
</tr>
<tr>
<td>Changes to permit status</td>
<td>Citizen Access Portal</td>
<td>Immediately</td>
</tr>
<tr>
<td>City enforcement as described in Section 7.2</td>
<td>Onsite personnel</td>
<td>Immediately</td>
</tr>
</tbody>
</table>
Application → Submittal → Review/Revise/Resubmit → CAA/MS4 Approval → Construction Activity → Post-Construction Activity
# Post-Construction Activity – Close-Out Package

<table>
<thead>
<tr>
<th>Single Family Residential</th>
<th>Site Plan</th>
<th>Subdivision/Road Construction Projects</th>
<th>Linear Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Close-Out Application</td>
<td>• Close-Out Application</td>
<td>• Close-Out Application</td>
<td>• Close-Out Application</td>
</tr>
<tr>
<td>• Hydrostatic Testing Results (if required)</td>
<td>• SCDHEC Notice of Termination (copy)</td>
<td>• SCDHEC Notice of Termination (copy)</td>
<td>• SCDHEC Notice of Termination</td>
</tr>
<tr>
<td>• Dye Testing Results (if required)</td>
<td>• Stormwater Record Drawings*</td>
<td>• Stormwater Record Drawings*</td>
<td></td>
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<tr>
<td></td>
<td>• CPMSF Agreement and Fee*</td>
<td>• CPMSF Agreement and Fee*</td>
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</tr>
<tr>
<td></td>
<td>• Hydrostatic Testing Results (if required)</td>
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<td></td>
<td>• Dye Testing Results (if required)</td>
<td>• Dye Testing Results (if required)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• In Situ Infiltration Testing Results (if required)</td>
<td>• In Situ Infiltration Testing Results (if required)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Stormwater Inspection Video (if applicable for public infrastructure)</td>
<td>• Stormwater Inspection Video (if applicable for public infrastructure)</td>
<td></td>
</tr>
</tbody>
</table>

*Required if project has a permanent structural stormwater measure

- Hydrostatic testing may be required when stormwater infrastructure will be conveyed to the City. Does not apply for Site Plan projects, unless a public utility is located within an easement.
- Dye Testing is required for any new sanitary sewer connection.
- In Situ testing is required for any infiltration BMP.
Post-Construction Activity

• A package is “Administratively Complete” upon receipt of all required documentation based on Construction Activity Type
• City will review and comment
• Once comments have been addressed, the City will issue a CAA Closeout Approval Letter
• Construction Process is complete after letter is received along with approval of Notice of Termination from SCDHEC
Warranty

• A 2-year warranted of the installed stormwater system shall be signed by the owner and submitted to the City

• City must accept the warranty before any type of Certificates of Occupancy are issued to the owner/permittee

• Any deficiencies, defects, or failures that occur during the 2-year time period will be addressed by the owner/permittee
  – City is to be notified
  – Subsequent inspection will be required after issues are addressed

• Prior to the end of the warranty period, City will inspect the stormwater facilities
  – Any deficiencies will be addressed by the owner/permittee
  – Subsequent inspection will be required after issues are addressed

• Pipes will be video inspected at the end of the 2-year time period and be subject to the same requirements at the initial inspection video
Conceptual Planning for Stormwater and Low Impact Development

*Educational Memorandum #2*

- **Principles of LID**
  - Working with the Landscape
  - Focus on Stormwater Runoff Prevention
  - Micromanage Stormwater
  - Keep it Simple
  - Practice Multi-tasking
  - Maintain and Sustain

- **Conceptual Site Planning**
  - Early Site Recognition
  - Inventory and Site Evaluation
  - Initial Concept Design Using Non-Structural BMPs
  - Preliminary Site Plan Development Incorporating Structural BMPs
  - Maintenance
Principles of LID: Working with the Landscape

- Integrates existing and natural systems as the framework for site planning
- Identifies environmentally sensitive areas and local features
- Outlines the development envelope
- Reduces the amount of hard stormwater infrastructure
- May reduce stormwater management costs

“At Fox Hollow, the developer (New Leaf Builders) wanted to create a low impact development that protected the trees, wetlands, and topography of the site. Unlike conventional development, where mass grading is common, at Fox Hollow the land has been highly conserved – only enough land for the houses and roadway were cleared. Narrow streets and driveways reduce impervious cover in the development. Rather than relying on pipes, a bioswale system conveys stormwater. Bioretention cells replace stormwater ponds.”

Picture and Quote Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)
Principles of LID: Focus on Stormwater Runoff Prevention

• Minimized by reducing road widths and parking areas, using shared driveways, and disconnecting impervious surfaces
• Clearing and regrading can be minimized by clustering and reducing building footprint
• Reduce runoff at the source by employing techniques like green roofs that can store and evaporate rainfall before it reaches the existing ground/grade

Source of Pictures: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)
Principles of LID: Micromanage Stormwater

- Manage stormwater where it falls instead of conveying long distances
- Create many small watersheds that can manage stormwater through a series of LID features and Post-construction BMPs
- Maximizes sheet flow causing little to no runoff for low-intensity storms

Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)
Principles of LID: Keep It Simple

- Emphasize simple
- Nonstructural, low-tech, and low cost methods are the goal
- Example methods:
  - Open drainage systems
  - Filter strips
  - Disconnection of roof runoff
  - Rain barrel/cistern
  - Public education (e.g., signage)
  - Minimize disturbed areas

*Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)*
Principles of LID: Practice Multi-tasking

- Design and create multi-functional landscape that provide stormwater management benefits:
  - Filtration
  - Treatment
  - Infiltration

- Ancillary benefits of LID – wildlife habitat and reduced heat island effects

Source of Pictures: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)
Principles of LID: Maintain and Sustain

- Incorporate native plants that are resistant to extreme conditions (wet and dry), low maintenance, have a deeper root system that promotes infiltration.
- Plant selection should reduce the use of pesticides, herbicides, and fertilizers.
- Lower maintenance designs are likely to be maintained and result in improved water quality.

Source of Pictures: Carolina Yards Plant Database (Clemson University; Clemson Cooperative Extension)
Conceptual Site Planning: Early Site Recognition

- Developer should assess property **BEFORE** a site is bought for investment return feasibility
- May consult with the City about a property to discuss specific permits, requirements, and potential obstacles that may come up in development

Figure 5.7-2. Jarvis Creek Park conceptual drawing (Source: Town of Hilton Head)

Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)
Conceptual Site Planning: Inventory & Site Evaluation

• Review Ordinances from all applicable City Departments (TRC Process)
• Locate environmentally sensitive resources: wetlands, mature trees, slopes, drainageways, permeable soils, waterway buffers
• **CONSIDER LID IMPLEMENTATION**
• Assess existing hydrology and soil characteristics on a watershed level
  – Determine if site is in a Special Protection Area
  – Determine if site drains to Impaired Waters
  – Evaluate downstream flooding potential or run-on issues from neighboring properties
  – Assess planned future development in the area
  – Erodibility of the soil
  – Steepness of slopes

Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)
Conceptual Site Planning: Inventory & Site Evaluation

- Assess existing hydrology on a site-specific level
  - Hydrological functions of the site: surface water, groundwater, and tidal influence
  - Natural resource locations
  - Geotechnical evaluation: soils for potential infiltration and water table depth
  - Effect of project size and shape on stormwater management
  - Determine areas best suited for development and those that should be avoided
  - Determine if areas exist where LID infiltration practices should be avoided due to historical land use and contamination

Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)
Conceptual Site Planning: Initial Concept Design Using Non-structural BMPs

- Develop initial concept plan based on information gathered during the Inventory & Site Evaluation process
- Incorporate non-structural best management practices (BMPs) Woodland and wetland protection
  - Clustering
  - Minimizing and disconnecting impervious surfaces
  - BMPs from the *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)
  
  [Image: Scenario A, Scenario B, Scenario C]

  Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)

Conceptual Site Planning: Preliminary Site Plan Development
Incorporating Structural BMPs

• Define development envelope/locate potential site
  – Cluster buildings and reduce building footprints to minimize clearing/grading
  – Determine possible LID BMPs for the site
  – Keep open space and wildlife habitat
  – Create small watersheds to route stormwater to a LID BMP
    • Use BMPs that promote filtration, treatment, and infiltration components
    • Use green rooftops and disconnection from rooftop to impervious areas
  – Maintain natural flow paths and use open drainage
  – Flatten slopes as much as possible to lengthen sheet flow
  – Reduce road widths
  – Use shared driveways/reduced parking areas with permeable paving
  – Align roads along grades
  – Minimize high maintenance lawn areas

• Draw the lot lines (for Residential Developments)

Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)
Conceptual Site Planning: Maintenance

• Depending on the BMP, maintenance can be low cost or rolled into the landscaping budget
  – If rolled into the landscaping budget, landscapers will need to be educated what and where the BMPs are located to avoid accidental damage or creation of obstacles (e.g., filling in a bioretention cell, installation of trim guards around any BMP)
• Maintenance schedules can be found in the *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)
• If responsibility is transferred to an HOA, LIDs are typically more affordable and easily accessible to maintain since BMPs are smaller

<table>
<thead>
<tr>
<th>Best Management Practice</th>
<th>Maintenance Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Pond</td>
<td>$4,411</td>
</tr>
<tr>
<td>Wetland</td>
<td>$752</td>
</tr>
<tr>
<td>Bioretention Cell</td>
<td>$583</td>
</tr>
</tbody>
</table>

*Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Table 1.2-5) (Ellis et al., 2014)*
*Note: Estimates are for a 10-acre watershed with a CN = 80.*
Technical Q&A