



**MANUAL OF DESIGN, INSTALLATION, AND
MAINTENANCE REQUIREMENTS**

FOR

STORMWATER MANAGEMENT PLANS

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ACRONYMS AND ABBREVIATIONS

BMP – Best Management Practice

CDA – Contributing Drainage Area

CEPSCI – Certified Erosion Prevention and Sediment Control Inspector

CGP – Construction General Permit (SCR 100000)

C-SWPPP – Comprehensive Stormwater Pollution Prevention Plan

CZC – Coastal Zone Consistency

EPA – Environmental Protection Agency

EQC – Environmental Quality Control

LCP – Larger Common Plan

LID – Low Impact Development

MTD – Manufactured Treatment Device

NOI – Notice of Intent

NOT – Notice of Termination

NPDES – National Pollutant Discharge Elimination System

OCRM – Ocean and Coastal Resource Management

OS-SWPPP – On-site Stormwater Pollution Prevention Plan

Ordinance – North Myrtle Beach's Stormwater Ordinance

PAM – Polyacrylamide

SCDHEC – South Carolina Department of Health and Environmental Control

SCS – Soil Conservation Service

SMS4 – Small Municipal Separate Storm Sewer System

SWDM – Stormwater Design Manual

USACOE – United States Army Corps of Engineers

USGS – United States Geological Survey

SECTION 1 GENERAL

1.1 Introduction

The Stormwater Design Manual (SWDM) defines minimum standards, requirements and procedures for the design, permitting, construction, and maintenance of stormwater drainage systems within the jurisdiction of the City of North Myrtle Beach (City). As an integral part of the City's stormwater program, this SWDM applies to site development to provide flood control, water quality improvement, and protect critical areas. The SWDM also contains appendices with detailed information to supplement the information included in the main portion of the manual.

The City is often presented with disputes between neighbors or adjacent properties regarding drainage and flooding. There are no written laws in South Carolina that pertain to drainage and flooding on private property. These types of disputes are only to be resolved through cooperation and agreement by all parties involved or in a court of law. The City of North Myrtle Beach's Public Works Department is legally constrained on the type of drainage situations it can work on and is not permitted to perform work on private property which does not have a public benefit. For more information on this topic, a summary of drainage disputes is included in Appendix A.

This SWDM presents minimum stormwater standards that apply to new development and redevelopment within the City. However, the minimum standards will not apply for all situations. Compliance with these standards does not relieve the applicant of the responsibility to use sound professional judgment or compliance with other local, state or federal requirements. The City intends for these standards to assist, but not substitute for, competent work by qualified design professionals.

The purposes of stormwater management are to:

1. Encourage Low Impact Development (LID) for achieving stormwater management,
2. Limit construction phase and post-development phase peak stormwater flow rates,
3. Reduce stormwater pollutant loads,
4. Mitigate the impacts of runoff due to additional impervious surfaces,
5. Maximize infiltration (e.g., minimize runoff) from developed property,
6. Facilitate groundwater recharge, and
7. Protect groundwater quality.

1.2 Applicability

The standards in this SWDM apply to new development and redevelopment projects.

Certain projects require a comprehensive stormwater management and sediment and erosion control plan (comprehensive stormwater pollution prevention plan – C-SWPPP) for submittal by the applicant and approval by the City. The City has the responsibility for plan review of:

1. All projects that result in land disturbance of one acre or more.
2. All projects that result in disturbance of less than one acre of total land area that is part of a Larger Common Plan (LCP) of development that comprise of one acre or more.
3. Any land disturbance within one-half (1/2) mile of a receiving water body (but not for single-family homes which are not part of a subdivision development that result in any land disturbance less than five (5) acres).

Redevelopment shall generally include changes or improvements to any property that has previously been developed which results in the addition or modification to the existing property, irrespective of the condition of the existing surface upon which the redevelopment is performed. This may include but is not limited to changing of land characteristics as a result of demolition and reconstruction, structural additions, paving, and regrading of the existing property.

Redevelopment projects shall be evaluated for the following:

1. If the redevelopment project site has an existing stormwater conveyance system that is serviceable and operational, perform an evaluation of the system in the redeveloped condition to determine if it is capable of conveying the redevelopment flows in accordance with the SWDM for the following:
 - A. If the existing stormwater conveyance system is capable of handling the redevelopment flows, then water quality treatment for the redeveloped area is required and a downstream analysis is required. If the project connects to a public system, the downstream analysis must show that the redevelopment project will not have an adverse impact on the public system capacity.
 - B. If the existing stormwater conveyance system is not capable of handling the redevelopment flows, then all standards of the SWDM apply for the entire site. Pre-development conditions shall be evaluated as open grass for the onsite soil type(s) for the project site. If the project connects to a public system, a downstream analysis must show that the redevelopment project will not have an adverse impact on the public system capacity.
2. If the redevelopment project does not have an existing stormwater conveyance system, no detention or retention, or no water quality treatment, then perform the following:
 - A. If the redevelopment project area is less than fifty (50) percent of the existing developed condition area and includes the addition of impervious area, then all standards of the SWDM apply to the additional impervious area.
 - B. If the redevelopment project area equals or exceeds fifty (50) percent of the existing developed condition area, then all standards of the SWDM apply for the entire redevelopment project area. Pre-development conditions shall be evaluated as open grass for the onsite soil type(s) for the project site.

The City shall review all stormwater related submittals for general compliance with these specific standards. An acceptance by the City does not relieve the applicant from the responsibility of ensuring

all systems are safe; that calculations, plans, specifications, construction, and record drawings comply with normal engineering standards; the requirements of this SWDM; and other applicable local, state, and federal rules and regulations. Where any other law, ordinance, resolution, rule, or regulations of any kind also encompass the requirements included in this document, the more restrictive shall govern.

The City Engineer may require more stringent requirements than would normally be required under these standards depending on special conditions and/or environmental constraints. The City Engineer has the option of accepting alternatives to the SWDM standard plans, specifications and design details (Appendix B) if the alternatives proposed meet or exceed the adopted performance standards.

1.3 Purpose

In order to protect the general health, safety, and welfare of the people of the City, to enhance the quality of surface waters of the City, and to protect the natural assets and resources of the City for posterity, the Stormwater Management and Erosion Control Ordinance (the Ordinance) was enacted by the City to, among other things, protect the lands and waters from the effects of excessive soil erosion and sedimentation, to prevent siltation of streams and lakes, to prevent clogging of drainage channels, to prevent excessive flood damage, to prevent damage to the property of adjacent landowners, and reduce pollutants in stormwater runoff from new development and redevelopment. A copy of the Ordinance is provided in Appendix C. The SWDM specifies the detailed analysis that is needed to complete the C-SWPPP and comply with the intent of the Ordinance. The SWDM establishes allowable runoff design criteria and drainage design standards for new development and redevelopment.

1.4 Authority

The Clean Water Act of 1972, as amended in 1987, prohibits the discharge of pollutants into waters of the United States unless the discharge complies with a National Pollutant Discharge Elimination System (NPDES) permit. The City is subject to the Phase II Stormwater NPDES permitting requirements and was issued NPDES General Permit for Storm Water Discharges from Regulated Small Municipal Separate Storm Sewer System (SMS4) coverage by the South Carolina Department of Health and Environmental Control (SCDHEC). The Federal and State NPDES permit program requires the City to “develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that discharge into the regulated SMS4.” Within this regulatory context, the City implements development requirements that reduce the water quality impacts of stormwater runoff.

Laws that provide the City with the authority to regulate stormwater drainage within the City’s jurisdiction include, but are not limited to the following:

1. Constitutional authority as a municipal corporation to promulgate regulations governing the discharge of stormwater.
2. Section 48-14-10 et seq. of the Code of Laws of South Carolina, 1976, amended.

3. City of North Myrtle Beach Code of Ordinances Chapter 13 - Stormwater Management and Erosion Control, Chapter 15 – Municipal Utilities, and Chapter 20 – Land Development Regulations.

1.5 Definitions

For definitions in this document, refer to the definitions listed in the City of North Myrtle Code of Ordinances under Chapter 13 – Stormwater Management and Erosion Control, in the Construction General Permit (SCR 100000), and in the NPDES General Permit for Stormwater Discharges from Regulated SMS4 (SCR030000).

SECTION 2 GENERAL STORMWATER REQUIREMENTS

2.1 SCDHEC-OCRM Permit Requirements

Unless otherwise exempt, all land disturbing activities disturbing one (1) or more acres of land, including sites smaller than one (1) acre that are part of a Larger Common Plan of development ultimately disturbing one (1) or more acres, are required to obtain permit coverage for their stormwater discharges by submitting an approvable C-SWPPP. Land disturbances less than one (1) acre which are located within one-half (1/2) mile of a coastal receiving water are also required to obtain permit coverage for their stormwater discharges. Coastal receiving waters are defined in the Policies and Procedures of the South Carolina Coastal Zone Management Program updated July 1995. Projects or developments located in the Coastal Zone that are not part of a Larger Common Plan of development, that disturb less than one acre, and are located within one-half (1/2) mile of a coastal receiving water are automatically granted coverage under the Construction General Permit without submitting an NOI, provided the appropriate Best Management Practices (BMPs) are used during construction activities. These construction activities require a Coastal Zone Consistency (CZC) determination, which is issued by DHEC's Office of Ocean and Coastal Resource Management. Certain activities may qualify for a General Coastal Zone Consistency review. Coastal Zone Management and CZC requirements are available at:

<http://www.scdhec.gov/Environment/WaterQuality/CoastalPermits/CoastalZoneConsistency/>.

Construction activities not listed require an individual CZC submittal and review by OCRM staff.

2.2 Categories of Operators

Each category of operator is specified by the operator's ownership, responsibilities and/or development of a construction site. These categories include Primary Permittees, Secondary Permittees and Contractors.

Primary Permittees may include, but is not limited to a developer, landowner, realtor, builder, utility provider, public or private entity, etc. This person has the option of employing contractors to conduct land-disturbing activities under their general permit coverage. Primary Permittees may rely on, or require, Secondary Permittees and/or contractors to assist with project activities necessary to ensure compliance with the CGP and implementation of the OS-SWPPP (on site stormwater pollution prevention plan).

Secondary Permittees are owners/builders seeking individual control of a portion or portions of a construction site, independent of the Primary Permittee, but still using the same C-SWPPP approved when initial coverage was granted. These Permittees are required to submit an Individual Lot Notice of Intent to obtain their permit coverage before conducting any land-disturbing activities. Examples of Secondary Permittees are individual lot(s) owners within a residential subdivision. The primary permittees permit coverage may be active or terminated, but if terminated the infrastructure must be completed. Also, if the primary permittee is no longer working on site, the infrastructure must be complete.

Contractors are operators that are employed by either the Primary or Secondary Permittee and have confirmed their understanding and promise to maintain compliance with the approved SWPPP by completing a Contractor Certification Form.

2.3 Application for Permit

The person responsible for the land disturbing activity shall apply in writing to the City for a permit for such activity. The person responsible for land disturbing activity shall also be required to obtain building permits and/or grading permits prior to beginning construction. One (1) copy of the complete permit package shall be submitted for initial review. This C-SWPPP shall be prepared in accordance with the provisions of the SWDM and the Ordinance. Four (4) additional copies of the plans shall be required when the review is complete.

Specific requirements of the permit application and approval process are based upon the extent of the land disturbing activity. The permit application and approval procedures are as follows:

1. For land disturbing activities requiring a C-SWPPP, the use of measures other than ponds to achieve water quality improvement, such as LID, are encouraged where applicable. Upon receipt of a completed application for stormwater management and sediment and erosion control, the City shall accomplish its review and have either the approval or review comments transmitted to the applicant within twenty (20) working days. If notice is not given to the applicant or if action is not taken by the end of the twenty (20) work day period, the applicant's plan is considered approved.
2. These requirements may be modified by the City on a case-by-case basis to address specific stormwater quantity or quality problems or to meet other regulatory requirements which are more stringent than the requirements of the Ordinance.
3. When the land disturbing activity consists of the construction of a pond, lake or reservoir which is individually built and not part of a permitted land disturbing activity, the following procedures apply:
 - A. A C-SWPPP will not be required if the pond, lake or reservoir is permitted under the state Dams and Reservoirs Safety Act (Regulation 72-1 thru 72-9) or has received a certificate of exemption under the state Dams and Reservoirs Safety Act. Best management practices shall be used to minimize the impact of erosion and sediment.
4. If the application for a C-SWPPP is denied, written notification indicating the reason or reasons for denial shall be forwarded to the applicant. The applicant may correct the deficiencies in conformance with the Ordinance and re-submit the application two additional times with no additional fee.
5. All re-submittals following the second re-submittal shall be subject to a fee of one-half (1/2) the original application fee. If the revised application is approved, the City shall issue the C-SWPPP approval.

6. Any C-SWPPP approval shall be suspended, revoked or modified by the City upon finding that the holder is not in compliance with the Ordinance.

The C-SWPPP contains supporting computations, drawings and sufficient information describing the manner, location and type of measures in which stormwater runoff will be managed from the entire land disturbing activity. The City shall review the C-SWPPP to determine compliance with the requirements of these regulations prior to approval. The approved C-SWPPP shall serve as the basis for water quantity and quality control on all subsequent construction activities specific to the site.

No additional stormwater permit shall be required under the Ordinance for land disturbing activities that are conducted under a state or federal environmental permitting, licensing or certification program where the state or federal environmental permit, license or certification is conditioned upon compliance with the minimum standards and criteria developed under this SWDM.

All C-SWPPPs submitted for approval shall contain a certification by the person responsible for the land disturbing activity (owner, developer, etc.) that the land disturbing activity shall be accomplished pursuant to the approved C-SWPPP and that responsible personnel will be assigned to the project.

All C-SWPPPs shall contain a certification by the person responsible for the land disturbing activity acknowledging the right of SCDHEC and the City to conduct on-site inspections.

The C-SWPPP shall not be considered approved without an approval stamp signed and dated by an authorized person with the City. The stamp of approval on the plans is solely an acknowledgement of satisfactory compliance with the requirements of the Ordinance and SCDHEC Stormwater Regulations. The approval stamp does not constitute a representation or warranty to the applicant or any other person concerning the safety, appropriateness or effectiveness of any provision of or omission from the stormwater and sediment control plan.

The applicant is required to send a copy of the City approved Notice of Intent (NOI), the City's approval letter, and the NPDES review fee to SCDHEC after the City has approved the C-SWPPP application. SCDHEC has seven business days from the receipt of this information to issue a Construction General Permit (CGP) letter granting coverage, denying coverage or requesting additional information. The land disturbing activity shall not begin until the City of North Myrtle Beach official approval and official stamped plans are delivered to the applicant and SCDHEC has issued the NPDES permit. The City of North Myrtle Beach official approval and official stamped plans shall not be released until the City receives a copy of the SCDHEC permit coverage. SCDHEC may request to review and comment on C-SWPPPs. The City cannot approve C-SWPPPs until NPDES permit coverage is received from SCDHEC.

All C-SWPPPs submitted to the City for approval shall be certified by a qualified designer. The following disciplines may certify, and stamp/seal plans as allowed by their respective licensing act and regulations:

1. Registered professional engineers as described in S.C. Code 1976, § 40-22-10 et seq.

2. Registered landscape architects as described in S.C. Code 1976, § 40-28-10(a).
3. Tier B land surveyor as described in S.C. Code 1976, § 40-22-10 et seq.

Pursuant to S.C. Code 1976, § 40-22-280, C-SWPPPs may also be prepared by employees of the federal government and submitted by the person responsible for the land disturbing activity to the City for approval.

The Ordinance does not prohibit other disciplines or certified professionals, including, but not limited to, certified professional erosion and sediment control specialists, which have appropriate background and experience from taking active roles in the preparation of the C-SWPPP and design process. All stormwater plans and specifications submitted to the City for approval shall be stamped/sealed by one of the qualified designers listed above.

Approved C-SWPPPs remain valid for two years from the date of approval. Extensions or renewals of C-SWPPP approvals may be granted by the City upon approval of an updated application by the person responsible for the land disturbing activity. If changes to the original C-SWPPP are not required, only a completed NOI and the appropriate application fee are needed.

2.4 Responsibility of the Applicant

The applicant is responsible for providing sufficient information to determine compliance with the Ordinance and SCDHEC Stormwater Regulations. The applicant is responsible for insuring that the information presented is true and factual representation of the existing conditions and proposed conditions after development. The applicant is also responsible for insuring that the improvements specified in the C-SWPPP shall be constructed according to the approved plan.

The applicant shall prepare a Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) in accordance with the requirements herein and shall submit the plan to the City for review and approval. The applicant shall not begin construction until permit coverage has been granted by SCDHEC.

If construction activities are conducted in response to a public emergency (e.g., earthquake, extreme flooding conditions, widespread disruption in essential public services), and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, stormwater discharges are allowable on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing construction activities establishing eligibility for coverage under this permit. Provide documentation in the C-SWPPP to substantiate the occurrence of the public emergency.

2.4.1 C-SWPPP Contents

In addition to the bulleted list included in this section, see Appendix D for the Plan Review Checklist for detailed submittal requirements.

1. A fully completed Notice of Intent (NOI) form for a permit. SCDHEC's NOI is included in Appendix E.

2. Application form with the following information:
 - A. Name, address and phone number of the applicant and owner if different from applicant.
 - B. Name, address and phone number of Professional Engineer.
 - C. Legal description of property or plat with location map.
3. A fully completed Stormwater Management and Sediment and Erosion Control Plan Review Checklist provided by SCDHEC (found in Appendix D).
4. A vicinity map on 8.5-inch by 11-inch paper indicating north arrow, scale, property boundary, and other information necessary to locate the property or tax parcel. The map shall show the proposed site, adjacent roads, and existing drainage structures including pipes, ditches, streams, lakes, catch basins, and similar facilities. The location sketch shall be of sufficient scale to determine features of the proposed site.
5. Pre-Development Site Information
 - A. Identification of existing soil characteristics on the site indicating seasonal water table conditions.
 - B. Percolation tests and soil boring by a licensed professional soil testing company shall be provided if percolation or any other subsurface infiltration systems are proposed. The percolation tests and soil boring shall be representative of the design conditions.
 - C. Federal Emergency Management Agency (FEMA) flood maps and, if available, federal and state wetland maps. The maps or plat shall show the location of the 100-year flood plain with known floodways if applicable.
 - D. Any off-site facilities or property located upstream and downstream that might be impacted by the stormwater runoff from this project shall be shown on the location sketch.
6. The location of the land disturbing activity with the property boundary outlined shown on a United States Geological Survey (USGS) 7.5-minute topographic map or copy, with the route of stormwater runoff from site to nearest waterbody shown.
7. Project narrative including signed certification by registered professional as described in Section 2.3 of this manual. For sites that are less than 2 acres, and not part of an LCP, the following details are required in the narrative:
 - A. Narrative description of the stormwater management and sediment control plan to be used during construction activities (may be included on plan in lieu of narrative)
 - B. General description of topographic and soil conditions of the site

- C. General description of adjacent properties and description of existing structures, buildings and other fixed improvements located on surrounding properties.
8. Full-size (22-inch by 34-inch) plans at an appropriate scale accompanied by a design report and indicating at least:
- A. The proposed improvements associated with the Stormwater Management Plan shall be shown on map(s) with a scale of no greater than 1-inch = 50-feet.
 - B. The existing and proposed topography showing spot elevations with contours not greater than two (2)-foot intervals, as required by the City. The plat and topographic map shall conform to provisions of applicable state regulations.
 - C. Proposed grading and earth disturbance including:
 - i. Surface area involved.
 - ii. Limits of grading, including limitation of mass clearing and grading, whenever possible.
 - D. Stormwater management and stormwater drainage computations, including:
 - i. Pre-development, construction phase, and post-development velocities, peak flow rates of discharge, retention volumes, and inflow and outflow hydrographs of stormwater runoff at all existing and proposed points of discharge from the site.
 - ii. Average slope and hydraulic length for both present conditions and for the future developed conditions.
 - iii. The existing landuse description, in accordance with landuse and soil groups from TR-55 (i.e. Wooded-fair cover);
 - iv. The amount of pervious and impervious surfaces for both the existing and developed conditions.
 - v. The delineated drainage basin and sub-basin areas in acres for both the site and any off-site areas which drain onto or through the site. Analysis and calculations showing the proposed project does not cause adverse upstream impacts.
 - vi. Runoff routing calculations for all detention basins showing discharge flow rates, elevations, and volumes retained or detained during applicable storm events. Calculations for storm events with more frequent return periods may be required by the City to be performed to insure the effectiveness of the system in controlling lesser events;
 - vii. For surface storage facilities, stage storage computation and stage discharge computations for major outfall structures shall be based upon appropriate hydraulics.

- viii. For subsurface percolation system, the calculations shall be based upon the testing results obtained from a licensed professional soil testing company with an appropriate factor of safety to account for seasonal variations in the groundwater table.
- ix. Site conditions around points of all surface water discharge, including vegetation and method of flow conveyance from the land disturbing activity.
- x. Design details for structural controls.

E. Erosion and sediment control provisions, including:

- i. Provisions to limit disturbance.
- ii. Provisions to control stormwater volume and velocity within the site to minimize soil erosion in order to minimize pollutant discharges during construction activity. This can be accomplished through the use of various BMPs and techniques including, but not limited to, the following:
 - a) Limiting of the amount of disturbed area not stabilized at a time;
 - b) Staging and/or phasing of the construction sequence;
 - c) Sediment basins and sediment traps;
 - d) Diverting off-site flow around the construction site;
 - e) Controlling the drainage patterns within the construction site;
 - f) Surface roughening along slopes;
 - g) Sediment basins and traps;
 - h) Level Spreaders;
 - i) Erosion control blankets;
 - j) Turf reinforcement mats;
 - k) Riprap; and
 - l) Staging and/or phasing of the construction sequence.
- iii. Provisions to control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion and scour in the immediate vicinity of discharge points during construction activity. This can be accomplished through the use of various BMPs and techniques including, but not limited to, the following:
 - a) Energy dissipaters;
 - b) Level spreaders;
 - c) Riprap aprons;
 - d) Erosion control blankets; and
 - e) Turf reinforcement mats.
- iv. Provisions to minimize the amount of soil exposed during construction activity including, but not limited to, the following:

- a) Implement a phased stormwater management plan that limits the amount of exposed soil during construction by outlining the Limits of Disturbance for each phase and by labeling areas that are not to be disturbed throughout the course of construction activities or until a later phase of construction activities;
 - b) Outline the Limits of Disturbance on the construction plans and label areas within the construction site that are not to be disturbed;
 - c) Stabilize exposed areas as soon as practical to limit the duration of large areas of exposed soil; and
 - d) Implement temporary seeding/grassing techniques.
 - v. Provisions to minimize the disturbance of existing steep slopes (i.e., slopes of 30% (~3H:1V) or greater), unless infeasible. If steep slopes must be disturbed, or are created through grading activities, the C-SWPPP shall:
 - a) Divert flows around steep slope disturbances. Divert concentrated or channelized flows of stormwater away from and around areas of disturbance having steep slopes; and
 - b) Use BMP as described in Section 3.2.10.A.IV of the SCDHEC CGP.
 - vi. Provisions to minimize sediment discharges from the site during construction activity.
 - vii. Provisions to provide and maintain natural buffers around Waters of the U.S after stormwater runoff is treated by construction site BMPs, unless infeasible during construction activity. Buffer zone management requirements listed in Section 3.2.4 of the SCDHEC CGP are applicable to all site development projects in North Myrtle Beach.
 - viii. Provisions to minimize soil compaction.. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.
 - ix. Provisions to preserve topsoil, unless infeasible. Preserving topsoil is not required where the intended function of a specific area of the site dictates that the top soil be removed.
 - x. Details of site grading.
 - xi. Design details for structural controls, which include diversions and swales.
- F. Description of all post-construction stormwater management measures that will be installed during the construction process to address water quality in stormwater discharges after the construction operations have been completed. Include the location and details of all stormwater control structures with control elevations and any seasonal water level regulation schedules.
- G. Project specifications (where applicable) for work related to stormwater management and sediment and erosion control.

- i. Provisions to provide soil stabilization (temporary and permanent).
- ii. Provisions to minimize the discharge of pollutants from dewatering trenches and excavations. Discharges are prohibited unless managed by appropriate BMPs for stormwater and non-stormwater discharges. Discharges of groundwater contaminated by past industrial uses at the site or area may require an alternate or additional wastewater permit.
- iii. Provisions to design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants during construction activity. At a minimum, such measures shall be designed, installed, implemented and maintained to:
 - a) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters shall be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
 - b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and
 - c) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.
- iv. Provisions to manage the following prohibited discharges:
 - a) Wastewater from washout of concrete, unless managed by an appropriate control;
 - b) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
 - c) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
 - d) Soaps or solvents used in vehicle and equipment washing.

H. The C-SWPPP shall identify and delineate all Critical Areas located within and/or directly adjacent to the proposed disturbed area and construction site. Any impacts to Critical Areas shall be identified on the C-SWPPP with a description of the proposed activities and the amount and type of impact(s).

- i. Identified areas of Critical Area impact(s) shall be labeled on the C-SWPPP that no work can begin in these areas until all necessary Critical Area authorizations have been obtained for the work.
- ii. If a structural/water quality BMP is proposed to be installed within a Critical Area, the water quality BMP shall be designed, installed and maintained to achieve maximum pollutant removal.

I. CZC Certification(s).

- J. Identify and show water bodies and water courses adjacent to the site with details of size, side slopes, capacity and depth.
 - K. For any site with off-site drainage flowing through the site, identify and show drainage basin boundaries for the site and any off-site areas including direction of flow and acreage. As directed by the City Engineer, upstream analysis shall be conducted to ensure the project has capacity to convey upstream runoff and does not cause adverse upstream impacts, such as flooding.
 - L. Paving, grading, and drainage plans along with locations of roads, parking areas, and buildings along with their proposed elevations.
 - M. The location of any existing or proposed private or public drainage easements shall be shown. Public easements shall be granted when stormwater facilities are to be maintained by the City. Private easements shall be obtained when stormwater management facilities are located on property not within the proposed site. Private easements shall be established when the stormwater system crosses more than one parcel.
 - N. The location, size and elevation of any internal or external stormwater management facilities shall be shown with sufficient details to determine the materials of construction and the manner of construction.
9. The person(s) or organization(s) responsible for operation and maintenance of the facilities included in the C-SWPPP shall be clearly identified. Include a signed Operation and Maintenance form for any applicable permanent stormwater BMPs (see Appendix F).
10. The City requires that plans and design reports be sealed by a qualified design professional and certified that the plans have been designed in accordance with the Ordinance, the SWDM, and SCDHEC Regulations.
11. Additional information necessary for a complete project review may be required by the City as deemed appropriate. This additional information may include items such as location of public sewers, waterlines, septic fields, wells, etc.
12. All contents of the design report and supporting documents shall be submitted in a binder with tabs (e.g., Maps, Pre-Development calculations, etc.) and pages numbered [no loose pages].

2.4.2 C-SWPPP Specific Requirements

1. Specific requirements for the erosion and sediment control portion of the C-SWPPP approval process include, but are not limited to, the following items. The City may modify the following items for a specific project or type of project.
- A. All C-SWPPPs shall include details and descriptions of temporary and permanent erosion and sediment control measures along with other protective measures shown on the C-SWPPP. Procedures in a stormwater and sediment control management plan shall provide that all

sediment and erosion controls are inspected by the applicant or representative at least once every calendar week, or after a one (1) inch rain event.

B. Specifications for a sequence of construction operations shall be contained on all plans describing the relationship between the implementation and maintenance of sediment controls, including permanent and temporary stabilization and the various stages or phases of earth disturbance and construction. The specifications for the sequence of construction should, at a minimum, include:

- i. Clearing and grubbing for those areas necessary for installation of perimeter controls.
- ii. Installation of sediment basins and traps.
- iii. Construction of perimeter controls.
- iv. Remaining clearing and grubbing.
- v. Road grading (if applicable).
- vi. Grading for the remainder of the site.
- vii. Utility installation and whether storm drains shall be used or blocked until after completion of construction.
- viii. Final grading, landscaping, or stabilization.
- ix. Removal of sediment controls.

C. Receiving Waters with TMDLs:

If a TMDL, that is applicable to stormwater construction discharges, has been established and is in effect for any receiving waters downstream of a construction site, then the C-SWPPP shall address:

- i. Include documentation supporting a determination of permit eligibility with regard to waters that have a TMDL that is effective and applicable to Stormwater construction discharges (See Section 1.3.3.D of the SCDHEC CGP for further information on determining permit eligibility related to TMDLs).
- ii. Include documentation of whether the construction site's stormwater discharge is identified, either specifically or generally, in a TMDL and if there is any associated allocations, requirements, and assumptions identified for the construction site's discharge.
- iii. Identify if a specific Waste Load Allocation (WLA) has been established that would apply to the construction site's stormwater discharges and incorporate that allocation

into the stormwater management plan by implementing any necessary steps and/or BMPs to meet that allocation.

- iv. Identify measures to be taken by the Operator so that the construction site's discharge of pollutants is consistent with the allocations, assumptions, and requirements contained in the TMDL, only the pollutants applicable to Stormwater discharges, including any specific WLA that has been established.

D. Receiving Waters with Impairments:

If the receiving water is listed on the most current South Carolina 303(d) List of Impaired Waters, the C-SWPPP must be developed so that any stormwater discharges from the construction site do not cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard. For receiving waters listed for a sediment or a sediment-related parameter (i.e., BIO (macroinvertebrate), turbidity, Total Phosphorous, Total Nitrogen, and Chlorophyll-a, the C-SWPPP shall address:

- i. Carefully evaluate all selected BMPs and their performance such that the construction site's stormwater discharges will not cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard.
- ii. For construction sites that disturb twenty five (25) acres or more and which have stormwater discharges draining directly to an impaired water body via structures or ditches, the C-SWPPP shall contain a written quantitative and qualitative assessment demonstrating that the BMPs selected shall control the construction site's stormwater discharges so that they will not cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard.
- iii. For receiving waters listed for a Fecal Coliform impairment in Shellfish Harvesting Waters in the Coastal Zone, carefully evaluate the location of portable toilets and waste receptacles to minimize the risk of an excursion above any state water quality standard.

- E. Phased Erosion Prevention and Sediment Control (EPSC) Plans are required for all construction sites with greater than five (5) acres of disturbance. Projects less than ten (10) acres in disturbance are required to submit, at a minimum, a 2-Phased EPSC Plan that includes an Initial Land Disturbance Phase and Final Stabilization phases.

Projects with disturbances greater than or equal to ten (10) acres are required to submit, at a minimum, a 3-Phased EPSC Plan that includes an Initial Land Disturbance Phase, Construction Phase, and Final Stabilization Phase.

Each phase is required to be identified on at least one (1) separate construction plan sheet and contain a phase specific construction sequence.

- F. When permitted work in a live waterway is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction.
- G. Vehicle tracking of sediment from land disturbing activities onto paved public roads carrying significant amounts of traffic shall be minimized.
- H. The C-SWPPP shall identify all allowable sources of non-stormwater discharges, except for flows from firefighting activities that are combined with stormwater discharges associated with construction activity at the Site. Non-stormwater discharges should be eliminated or reduced to the extent where these discharges shall not cause or contribute to violations of water quality standards.

2.5 C-SWPPP Review and Approval

The City shall review all C-SWPPPs for compliance with applicable requirements. Approval by the City does not relieve applicants from responsibility for ensuring system performance, safety and compliance with other local, state and federal regulations. Applicants shall ensure that calculations, designs, specifications, construction, and record drawings comply with acceptable engineering standards and this SWDM. City approval does not constitute a guarantee of system performance nor does it relieve the applicant of liability for the sufficiency, suitability or performance of facilities. For projects regulated by other jurisdictions, applicants shall comply with any additional or varying requirements and receive approval from those entities. Applicants are to provide proof of approval to the City as deemed necessary.

Where existing wetlands are intended as a component of an overall stormwater management system, the approved C-SWPPP shall not be implemented until all necessary federal and state permits have been obtained.

2.6 Start of Construction

The City requires that a pre-construction conference be performed on-site for all non-linear projects prior to the beginning of land disturbing activities to ensure all contractors performing the work know their responsibilities under the permit. The applicant shall notify the City at least five (5) business days prior to conducting the pre-construction conference.

The applicant shall notify the City at least three (3) business days prior to commencement of any land disturbing activity or construction under an approved C-SWPPP. Necessary City and/or grading permits required must be obtained.

The City will attend any pre-construction conference. At its discretion, the City may make inspector attendance at the pre-construction conference a condition of approval.

2.7 SWPPP Availability (OS-SWPPP)

The On-site Stormwater Pollution Prevention Plan (OS-SWPPP) shall be retained at the construction site from the date of commencement of construction activities to the date of final stabilization. If an on-site location is unavailable to store the OS-SWPPP, notice of the OS-SWPPP's location along with any updated contact information, shall be posted at the construction site. OS-SWPPP locations shall be easily accessible (not more than a 30-minute drive away from the project site) and shall be accessible during normal business hours to SCDHEC, Environmental Protection Agency (EPA), local government officials, and the City for review the OS-SWPPP.

The OS-SWPPP includes:

1. All items required for the C-SWPPP except for the engineering calculations and engineering reports;
2. NOI (stamped and approved copy), and copy of the CGP coverage letter from SCDHEC;
3. Copy of local approvals (additional letters, approvals, or certifications necessary to implement the OS-SWPPP, when necessary);
4. Copy of United States Army Corps of Engineers (USACOE) approvals (certifications to allow impacts to Waters of the State or Jurisdictional wetlands, when necessary);
5. Contractor certifications, (certifications necessary to allow contractors to conduct construction activities within the construction site);
6. Any logs necessary to track the progress, compliance, modifications and those associated with the construction site. These logs may include, but are not limited to, a pre-construction conference log, an inspection log, a stabilization log, a rain log, a contractor log and/or any additional record keeping as deemed necessary by the City, Contractor, SCDHEC, SMS4 or an entity delegated under Regulation 72-300;
7. SCDHEC Construction General Permit (One copy, excluding the appendices. Provisions may be made for the copy of the general permit to be accessed electronically as long as a hard copy can be made available by the end of the working day when required); and
8. CZC Certification. For projects located in the Coastal Zone, the acquired Coastal Zone Consistency (CZC) certification shall be kept in the On-site SWPPP.

The person(s) responsible for day-to-day operational control over implementation, shall have a copy of the OS-SWPPP available at a central location on-site for the use of all those identified as having responsibilities under the OS-SWPPP whenever they are on the construction site.

For linear construction of roads or utilities (such as utility construction including electrical power lines, gas lines, main sewer trunk lines, and water distribution lines) that are not part of a Larger Common Plan of development, where it is not practical to have the OS-SWPPP on location, the

Permittee and/or Operator shall, upon request, make the OS-SWPPP available by the end of normal business hours, or by the following business day under extenuating circumstances.

OS-SWPPPs shall be made available upon request and at the time of a construction site inspection by the City. Updated copies of the approved OS-SWPPP shall be sent to the appropriate SCDHEC Environmental Quality Control (EQC) Regional Office in situations where it is not practical to have the approved OS-SWPPP on location.

2.8 Modifications

Each OS-SWPPP shall be modified if during inspections or investigations by City, state, tribal or federal officials it is determined that the OS-SWPPP is ineffective in either eliminating, when reasonably possible, or significantly minimizing pollutants in stormwater discharges from the construction site.

Each OS-SWPPP shall be modified as necessary to include additional or modified BMPs, which are designed to correct problems identified during the construction site inspection by any qualified inspector, or by local, state, tribal or federal officials. Revisions to each SWPPP shall be completed within seven (7) calendar days following the inspection.

1. Major Modifications - The C-SWPPP shall be modified and submitted for review and receive approval by the City prior to implementation if any of the following conditions are met:
 - A. Whenever there is a significant change in design, construction, operation, or maintenance at the construction site resulting in discharges that will cause, have the reasonable potential to cause, or contribute to violations to Water Quality Standards.
 - B. Whenever a change in the design, construction, operation, or maintenance calls for a revision of any approved C-SWPPP based on the following list of modifications:
 - i. Modifications that will affect the hydrology or trapping efficiency calculations including the following:
 - a. Resizing Sediment or Detention Basins that either reduces the stormwater volume capacity and/or is resized to handle increase/decrease incoming peak flows or runoff volumes due to revised site development plans;
 - b. Deletion of Sediment or Detention Basin or Sediment Trap;
 - c. Relocation of Sediment or Detention Basins resulting in increases/decreases in receiving drainage area and/or resulting in a new/relocated basin outlet location, which is directed towards an outfall that was not approved within the C-SWPPP;
 - d. Addition/Removal of Sediment or Detention Basin;
 - e. Modification of Sediment or Detention Basin Outlet Structure;

- f. Changes in grading that alter drainage patterns that may result in increased or decreased flow to a Sediment or Detention Basin; and
 - g. Amending Construction Sequence in a fashion that the Detention Basin is not installed before Grubbing Operations begin.
- ii. Point Discharge or Outfall location changes.
 - iii. Any modification to regulated water quality structural control measures.
 - iv. Adding a new point discharge.
 - v. Addition of Impervious Area due to revised site development plans.
 - vi. Addition of Disturbed Area.
 - vii. Changes to Navigable Water Crossing.
 - viii. Addition of Sediment Trap(s) when required to obtain 80% Trapping Efficiencies for disturbed areas not previously permitted or redirected away from an approved water quality BMP.
 - ix. Site layout changes that require redesigning the stormwater management system.
 - x. Any additional modifications as determined by the City.
 - xi. For projects located in the Coastal Zone, major modifications may require a new CZC determination to be submitted along with the revised C-SWPPP.
 - xii. Changes to the status of jurisdictional features on the site may constitute a major modification.
2. Minor Modifications -The Permittee shall modify the OS-SWPPP and keep a record of each modification within the OS-SWPPP if any of the following conditions are met:
- A. Addition of BMPs - Addition of Silt Fence, Slope Drains, Inlet Protection, Outlet Protection that does not involve additional wetland impacts, Construction Entrance or Check Dams to improve the overall stormwater management and sediment and erosion control at the construction site.
 - B. BMP Relocations - Relocation of construction entrance, pond inlet pipes (within a pond), and any other proposed BMP to improve the overall stormwater management and sediment and erosion control at the construction site.
 - C. Removal of Disturbed Areas - As long as the removal of the disturbed area does not also remove any BMPs required to meet Water Quality or Quantity Standards. Removal of disturbed area only qualifies for disturbed area that was included in the initial coverage approval and that was never disturbed (i.e., cleared, grubbed or graded).
 - D. Modifying Individual Lot Drainage - Unless the changes affect the inflow to a Detention Structure or Analysis Point, to which the lot drains, that was not previously approved.

2.9 Ending Construction

Upon project completion related to the land disturbing activity, a Notice of Termination (NOT) is sent to the City Engineer so a final inspection can be conducted to review compliance with the approved C-SWPPP.

The NOT may only be submitted after one or more of the following conditions have been met:

1. Final stabilization has been achieved on all portions of the site for which the Permittee is responsible;
2. Another Operator has assumed control, according to §122.41(1)(3) of SC Regulation 61-9, over all areas of the site that have not been finally stabilized;
3. Coverage under an individual or alternative general NPDES permit has been obtained;
4. For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner;
5. For construction activities on land used for agricultural purposes (e.g., pipelines across crop or range land, staging areas for highway construction, etc.), either (1) final stabilization has been accomplished by returning the disturbed land to its pre-construction agricultural use, and (2) for any areas disturbed that were not previously used for agricultural activities and areas which are not being returned to their pre-construction agricultural use have achieved final stabilization; or
6. Land disturbance activities were never initiated on the construction site and the construction site remains permanently stabilized.

The NOT shall be signed by the Permittee and submitted within thirty (30) days of one of the above conditions being met.

The NOT is not valid until the City concurs and notifies the Permittee of City acceptance of the NOT.

If a NOT has been submitted and the construction site does not meet the criteria for termination, then the construction site remains subject to the provisions of the OS-SWPPP.

If there are any permanent BMPs on the site, a revised maintenance agreement shall be submitted along with the NOT, when the responsible party(ies) or individual(s) accepting ownership or maintenance of permanent stormwater control devices have changed from what was originally approved.

For residential subdivisions, Primary Permittees do not need to terminate permit coverage in areas where Secondary Permittees have received permit coverage to perform work under the permit. Primary Permittees can request to terminate coverage when Secondary Permittees are authorized to conduct construction activities, independent of the Primary Permittee, for the remaining disturbed

areas on the construction site and final stabilization has been achieved on all other areas of the construction site.

The person responsible for the land disturbing activity shall submit as-built or record document plans for all plans that include any permanent structural BMPs. Stormwater as-builts shall be submitted per the City's requirements. In addition, the person responsible for the land disturbing activity is required to submit written certification from the professional engineer, landscape architect or tier B land surveyor responsible for the field supervision of the land disturbing activity that the land disturbing activity was accomplished in substantial accordance with the approved C-SWPPP.

SECTION 3 DESIGN STANDARDS

3.1 Stormwater Management General Standards

The purpose of this section is to establish engineering standards for the design, construction and maintenance activities of Stormwater Management Plans. Stormwater Management Plans shall be approved, consistent with procedures in the Ordinance, when the applicant has demonstrated that the proposed development activity has been designed and shall be constructed and maintained to meet each of the following performance standards:

1. To encourage the use of Best Management Practices, i.e. maximum use of on-site storage facilities to reduce runoff flow rates and volumes and minimize erosion and sedimentation.
2. To design, construct, and maintain stormwater management facilities in a manner to control post-development runoff to simulate the time discharge function for pre-development runoff provided residual capacity is available in off-site facilities to accommodate the runoff.
3. To design, construct, and maintain stormwater management facilities in such a manner that erosion or sedimentation does not exceed natural pre-development conditions.
4. To assure that no adverse impacts result from improper location, design and construction of stormwater management facilities.
5. To design construct and maintain stormwater management facilities consistent with mosquito objectives and programs.
6. To protect the water quality of the ocean and the physical characteristics of the beach area by minimizing flow rates, volumes, and velocities of stormwater entering drainage systems discharging to the beach.
7. To design, construct, and maintain stormwater management facilities in compliance with all applicable state regulations, including SCDHEC Standards for Stormwater Management and Sediment Reduction Regulation 72-300, NPDES General Permit for Storm Water Discharges from regulated SMS4'S SCR030000, SCDHEC/OCRM Policies and Procedures of the South Carolina Coastal Management Program, and NPDES Permit SCR035106.

3.2 Stormwater Management Design Requirements

3.2.1 General

1. Plans, calculations, and supporting documentation as required by the Ordinance for the design, construction, and maintenance of stormwater management facilities shall be prepared and sealed by a Professional Engineer currently licensed in the state of South Carolina or a Professional Land Surveyor currently licensed by the state of South Carolina when permitted by the Ordinance.

2. Innovative approaches to stormwater management are encouraged and the concurrent control of flooding, erosion, sedimentation, and stormwater pollution are mandatory.
3. Projects that are developed in phases shall require the submission of a master plan of the entire project. Applications for individual projects shall be considered only when the phases are totally independent of or make sufficient provisions for subsequent phases.
4. Development should maximize the amount of rainfall that infiltrates into the soils and minimize the amount of direct overland flow into public drainage facilities, adjoining streets, water bodies, watercourses, and wetlands to the extent feasible. Channeling runoff directly into watercourses is prohibited; instead runoff must be routed to reduce velocities, allow suspended solids to settle and remove pollutants.
5. A positive outfall for all runoff in excess of that retained shall be provided to a watercourse through appropriate easements or rights of way. If the downstream facilities are inadequate to convey the peak discharge for the design rainfall event(s), the proposed development shall accommodate that portion of runoff above the actual capacity.
6. The soil types of a development and contiguous watershed area are of a prime consideration in the design and maintenance of all stormwater management facilities.
7. A Soil Erosion and Sediment Control Plan shall be prepared and submitted as a part of the Stormwater Management Plan.

3.2.2 Hydrologic/Hydraulic Design Requirements

1. Design Storms

Post-development peak discharge rates shall not exceed pre-development discharge rates for the 2-, 10-, and 25-year frequency 24-hour duration Type III storm event. Post-development peak discharge rates for the 100-year 24-hour duration Type III storm event shall be evaluated.

2. Rainfall Data

United States Weather Service Rainfall Data compiled for Horry County by the South Carolina Water Resources Commission shall be used. The SCDHEC CGP requires that each C-SWPPP must use rainfall data from the South Carolina DHEC Stormwater Management BMP Handbook or another appropriate source such as a local NOAA gauge. Rainfall data from the SCDHEC BMP manual is provided below as well as a link to the NOAA Precipitation Frequency webpage.

Rainfall Data for 24-Hour Type III Storm Events (Inches)

| Location | 2-yr | 10-yr | 25-yr | 100-yr |
|---------------|------|-------|-------|--------|
| Horry - North | 4.1 | 6.3 | 7.9 | 10.8 |

http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=sc

3. Discharge Velocities

Discharge velocities shall be reduced to provide a non-erosive velocity flow from a structure, channel or other control measure or the velocity of the 10-year, 24-hour storm runoff in the receiving waterway prior to the land disturbing activity, whichever is greater.

3.2.3 System Design Requirements

1. Method of Runoff Rate and Volume Computations

The following methods and programs are acceptable for use in determining the peak runoff rate and runoff volumes. Any assumptions used in the computations shall be clearly delineated. The computation results shall be presented in a format that will permit confirmation of the results. For methods not outlined below, the applicant shall provide sufficient detail to determine the accuracy of the method or program used.

- A. For sites with less than 0.5 acres, the Rational Method may be used.
- B. For all sites, the Soil Conservation Service (SCS) TR-55 method may be used. This may be calculated by hand or using any computer program documented using the TR-55 method. A Type III rainfall condition shall be used.

2. Receiving Water Stage

- A. Regulated systems - Existing design and maintained elevations may be available from the City.
- B. Non-regulated systems – The applicant shall compute receiving water stages from the best information available and submit the results to the City for review prior to utilizing such results for further computations.
- C. Any system – Tailwater stages shall be considered if it has a significant influence on the design.

3. Detention/Retention Design Requirements

- A. Outlet structures shall be designed in accordance with accepted engineering principles, by applying appropriate hydraulic equations including orifice, weir, and culvert hydraulics.
- B. Outlet structures shall be designed to discharge post-development runoff peak flow rates equal to or less than the pre-development runoff peak flow rates for the 2-year, 10-year, and 25-year frequency 24-hour duration Type III storm event.
- C. If the downstream drainage facilities are inadequate to convey the peak discharge for the design storm events, storage volume shall be added to accommodate that portion of the runoff above the downstream's actual carrying capacity and the outlet structure shall be sized to restrict the peak discharge rates to accommodate downstream conditions.

- D. Where a basin discharges into a stream, ditch, swale or water body, the City may require an energy dissipater to reduce discharge velocities to minimize soil erosion and sediment transport.
- E. Detention and retention basins shall be designed to have an emergency spillway to discharge flows in excess of the 25-year, 24-hour storm event. The spillway shall be located so the discharge does not erode the basin or receiving channel. If the 100-year storm can be retained completely on site, an emergency spillway is not required.
- F. Underground detention basins shall be designed to have water quality treatment at all inlets to the underground detention chamber(s) to minimize sediment buildup within the main underground detention chamber(s).

4. Impervious Areas

Runoff shall be discharged from impervious surfaces through retention basins, detention basins, acceptable LID BMPs, infiltration BMPs, Manufactured Treatment Devices (MTDs), and/or subject to some type of BMP prior to discharge from the project site. BMP refers to a practice or combination of practices determined by the design professional to be the most effective means of preventing or reducing the amount of siltation and pollution discharged from the project site.

5. Stagnant Water Conditions

Dead end flow configurations, which create stagnant water conditions, shall not be allowed. All BMPs shall be designed, constructed, and maintained with consideration for the proper control of mosquitoes and other vectors.

6. Stormwater Management Structures

Areas to be utilized for the conveyance or storage of stormwater shall be legally reserved for that purpose by plat, easement or other means so that subsequent owners or others may not remove such areas from their intended use. Such areas shall be connected to a public road or other location from which operation and maintenance is legally available. Ease of maintenance shall be considered as a site design component. Access to the stormwater management structure shall be provided.

A clear statement of defined maintenance responsibility shall be established during the C-SWPPP review and approval process. A maintenance agreement shall be signed for all permanent structural BMPs. The City's Stormwater Management BMP Maintenance Agreement is located in Appendix F.

7. Upstream Runoff

Runoff from higher adjacent or upstream lands shall be considered and provisions for conveyance of such runoff shall be included in drainage plans. As directed by the City Engineer, upstream

analysis shall be conducted to ensure the project has capacity to convey upstream runoff and does not cause adverse upstream impacts, such as flooding.

3.2.4 Downstream Analysis

Downstream analysis shall be required for all new development and re-development sites unless the City Engineer determines it is not required. When water quantity controls are implemented, an off-site analysis may not be required, provided that all required design criteria of this SWDM are met.

In some cases, the design professional may verify that storm water quantity controls may adversely impact downstream conditions. Therefore, downstream analysis shall be performed prior to sizing storm water quantity control structures to determine the extent of the controls to be implemented. Downstream analysis may show that more stringent controls need to be implemented to effectively prevent any adverse downstream impacts.

The downstream peak flow analysis shall include the assumptions, results and supporting calculations to show safe passage of post-development design flows downstream. The analysis of downstream conditions in the report shall address each discharge point along the project site's boundaries at which runoff exits the property. The analysis shall focus on the portion of the drainage channel or watercourse immediately downstream from the project. This area shall extend downstream from the project to a selected point of concern. In calculating runoff volumes and discharge rates, consideration may need to be given to any planned or known future upstream landuse changes.

1. Downstream Analysis Limits

Hydrologic and hydraulic engineering analysis shall be implemented to determine the downstream effects from any development activity. This analysis shall extend downstream to a specific point of concern. The point of concern may be identified by the City Engineer in certain situations. The following are typical points of concern:

- A. The point downstream where the development represents less than ten (10) percent of the total drainage of the watershed.
- B. The first downstream road crossing.
- C. Downstream development.
- D. Location of known existing flooding, drainage, or erosion problems.
- E. Any point as directed by the City.

The primary areas of analysis shall be done for the following:

- A. The development area;
- B. All drainage exit points from the property;

- C. The receiving channel at the exit points; and
- D. Each component of the downstream system including:
 - i. Channels
 - ii. Pipes
 - iii. Culverts
 - iv. Bridges
 - v. Overbank areas
 - vi. Overbank structures

2. Downstream Analysis Design Storm Events

All downstream analysis shall be done using the 2-year, 10-year, 25-year, and 100-year 24-hour Type III storm events.

3. Downstream Analysis Criteria

- A. The downstream analysis shall determine whether the design storm events of interest cause or increase flooding, drainage, or erosion impacts to downstream properties or road crossings. The analysis criteria shall include but is not limited to:
 - i. Existing landuse curve numbers shall be used for undeveloped and developed areas upstream. Where future development areas are known upstream, the City Engineer may require these areas to be considered developed in the future land use condition;
 - ii. Existing landuse for downstream areas of interest may be used, but future landuse, when applicable, is recommended for conservative results.
 - iii. Routing of flows using accepted hydrologic and hydraulic methods.
 - iv. Hydraulic step-backwater calculations (Corps of Engineer's HEC-2 or HEC-RAS models or equivalent) shall be performed to determine flood elevations of any downstream impacted areas.
 - v. The effects of any upstream and proposed storm water quantity or quality structures.

4. Improvement Options

If the downstream analysis determines that the development of a particular site does contribute to flooding, drainage, or erosion problems, then at least one the following improvements shall be implemented:

- A. On-site water quantity control.
- B. Off-site water quantity control.

C. Improvements to the downstream storm water conveyance system.

5. On-Site Water Quantity Control

The design professional may select to implement on-site water quantity control structures designed according to this SWDM. These structures may consist of nonstructural controls such as swales, open drainageways, and low areas within the site terrain. These structures may also consist of structural approaches such as engineered detention facilities.

6. Off-Site Water Quantity Control

The design professional may use an off-site publicly or privately-owned facility to prevent adverse downstream impacts. The use of off-site facilities must meet the following requirements:

- A. The facility to be used must be functional,
- B. The owner/entity has agreed to accept runoff from the proposed development site,
- C. The owner has an implemented maintenance agreement for the facility,
- D. The facility is sized to effectively handle increased flow rates and flow volumes, and
- E. There are no significant adverse impacts between the outlet from the proposed development site and the inlet to the off-site facility.

7. Improvements to the Downstream Storm Water Conveyance System

The design professional may perform and provide supporting calculations that indicate that the best solution is to upgrade the downstream system. This option may be implemented under the following requirements:

- A. The downstream property owner of the facilities to be improved has granted temporary construction easements,
- B. The downstream improvements are economically feasible, and
- C. The improvement will not cause any other significant problems downstream.

3.2.5 Sediment and Erosion Control Requirements

The purpose of the Soil Erosion and Sediment Control Plan is to provide effective measures to control erosion and sedimentation caused by the removal of ground surface cover.

1. General

- A. Effective erosion and sediment control design requires consideration of stormwater flow and soils to be encountered.

- B. Proper design includes measures for erosion control and provide for the establishment of vegetation that shall help avoid erosion problems during and after development activities.
- C. Alignment, grades, area of disturbed soil and bank slopes are based upon soil erodibility, climate exposure, geology, proposed vegetative restoration and expected maintenance.

2. Standards and Guidelines for Design

- A. Slopes shall be protected from erosion by quick establishment of vegetative cover, erosion control blankets, benches, terraces, slope protection structures, mulches, polyacrylamide (PAM), or a combination of these practices as required.
- B. Except as provided below, initiate soil stabilization measures as soon as practicable whenever land-disturbing activities have been temporarily or permanently ceased, but in no case more than fourteen (14) days after land-disturbing activity in that portion of the construction site has temporarily or permanently ceased.
 - i. Where snow cover or frozen ground conditions preclude stabilization by the 14th day, stabilization measures shall be initiated as soon as practicable.
 - ii. Where construction activity on a portion of the construction site is temporarily ceased, and earth-disturbing activities shall be resumed within fourteen (14) days, temporary stabilization measures do not have to be initiated on that portion of the construction site.
- C. Drainage channels and conveyance measures shall be designed to avoid erosion problems. Wide channels with flat slopes lined with grass or other vegetation should be used where practical. All conveyance measures shall be designed to meet the following requirements/standards:
 - i. Each conveyance measure shall be stabilized and capable of handling the 10-year 24-hour storm event with non-erosive flow conditions during construction and post-construction. If the velocity exceeds five (5) feet/sec, then permanent velocity dissipation measures, devices, and/or erosion prevention BMPs shall be installed to provide non-erosive flow conditions.
 - ii. Complete stabilization of stormwater conveyance channels within seven (7) days of channel construction. Examples of vegetative and non-vegetative stabilization techniques include channel liners, rolled erosion control products (e.g., erosion control blankets and turf reinforcement mats), riprap, geotextiles, or other armoring materials that are suitable for use in areas with concentrated or channelized flow. Application of mulch, hydro-mulch, tackifier, or similar erosion prevention practices that are erodible, conveyable, or that obstruct flow when used in areas with concentrated or channelized flow in stormwater conveyance channels is prohibited.

- iii. Design channels to avoid disturbed areas and to reduce erosion. Divert concentrated flows of off-site stormwater running onto the site and within the construction site to avoid contact with soils exposed during construction, unless infeasible. Prevent erosion of channel embankments, outlets, adjacent streambanks, slopes and downstream waters during discharge conditions through the use of velocity dissipation devices (e.g., check dams, sediment traps, riprap, or grouted riprap at outlets) within and along the length of any constructed stormwater conveyance channel, and at any outlets to provide a non-erosive flow velocity.
 - iv. New point discharges onto adjacent property where there was not a point discharge previously are not allowed, unless written permission from the adjacent property owner is provided. A twenty (20) foot minimum buffer should be provided, where feasible, between the property line and the discharge point. Level spreaders, plunge pools, etc. shall be provided when the proposed outlet is near the property line and not directed to an existing outfall, such as a creek or ditch. Discharges of stormwater systems onto fill slopes should be avoided unless infeasible. When the aforementioned discharges are necessary additional protection must be provided to prevent erosion..
 - v. Appropriate velocity dissipation devices and/or erosion prevention BMPs shall be placed at discharge locations and along the length of any outfall channel to provide non-erosive flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected. Silt fence may not be used as an energy dissipater.
- D. Stormwater runoff and drainage to a single outlet from land disturbing activities, which disturb ten (10) acres or more, shall be controlled during the land disturbing activity by a sediment basin where sufficient space and other factors allow these controls to be used until the final inspection. The sediment basin shall be designed and constructed to accommodate the anticipated sediment loading from the land disturbing activity and meet a removal efficiency of eighty (80) percent suspended solids or 0.5 ml/L peak settleable solids concentration, whichever is less. The efficiency shall be calculated for disturbed conditions for the 10-year, 24-hour design event. In addition, the sediment basin shall be designed to meet the following requirements:
- i. Consider public safety as a design factor for the sediment basin, and alternative sediment controls must be used where construction site limitations would preclude a safe design.
 - ii. The City may on a case-by-case or watershed-by-watershed basis require the use of a larger storm event and/or a larger storage volume when designing sediment basins or equivalent sediment control BMPs.
 - iii. Unless infeasible, properly design, install, and maintain porous baffles, or similar control measures capable of enhancing settling capabilities and restricting the accumulation of sediment around the outlet structure, in all temporary sediment traps

and sediment basins to reduce velocity, turbulence, and improve sediment trapping efficiency.

- iv. Unless infeasible, sediment forebays, or similar control measures capable of providing sediment trapping at inlets of sediment basins such as porous baffles, should be installed as practicable based on sediment storage requirements of each sediment basin.
 - v. Unless infeasible, each sediment basin should be equipped with a cleanout stake indicating when the basin is to be cleaned.
 - vi. When discharging from sediment basins, utilize outlet structures that only withdraw water from near the surface of the basin or impoundment unless infeasible. This outlet structure should be capable of conveying the flow for the 10-year, 24-hour storm event. Typically, this is not feasible with only a floating skimmer. Select appropriate riser structure which operates in weir or barrel flow control and prevent orifice/riser flow control.
 - vii. Detention basins may also be used to trap sediment during and after development. When used for this purpose, the basin shall continue to detain stormwater in accordance with the hydraulic design criteria, but storage volume for stormwater shall be required to account for the volume lost to sedimentation. Sediment shall be removed periodically to insure the intended performance of the basin.
- E. Good stands of existing vegetation adequate to control erosion shall be preserved wherever possible. Regeneration of trees and other large vegetation should be encouraged wherever possible.
- F. Inlet protection shall be provided at all existing and newly installed inlets that receive stormwater runoff from the disturbed areas.
- G. Outlet protection shall be provided at all existing and newly installed outlets, within the construction site's boundary, that discharge stormwater runoff from the disturbed areas. Silt fence shall not be used as outlet protection.

3.2.6 Water Quality Requirements

The purpose of the City's water quality requirement is to reduce the impacts of stormwater runoff from new development and redevelopment by retaining pre-development hydrologic conditions to the maximum extent practicable. The following design methodologies are acceptable to meet this requirement.

- 1. When ponds are used for water quality protection, the ponds may be designed as both quantity and quality control structures. Sediment storage shall be specified by the designer for both during and after the land disturbing activity. Sediment storage volumes may be predicted by the universal soil loss equation or methods acceptable to the City.

2. Permanent water quality detention structures or ponds, having a permanent pool, shall be designed to store and release the first one-half (1/2) inch of runoff from the site over a 24-hour period. The storage volume shall be designed to accommodate, at least, one-half (1/2) inch of runoff from the entire site.
3. Permanent water quality control systems and ponds, not having a permanent pool, shall be designed to store and release the first one (1) inch of runoff from the site over a 24-hour period.
4. When infiltration is used for water quality protection, the minimum design storage volume is equal to 1-inch of runoff from the impervious surface of the contributing drainage area
5. Low Impact Development BMPs. The City has adopted certain design methodologies from the “Low Impact Development in Coastal South Carolina: A Planning and Design Guide”. See Section 3.2.7 for specific LID BMP design requirements for the City.
6. Other design standards and methodologies may be acceptable to the City. These may be used for certain soil conditions or groundwater table conditions which do not permit the release of the water quality volume within a 72-hour period after the storm event. These other methodologies will be evaluated on a case-by-case basis.

3.2.7 Low Impact Development BMP Design Requirements

The City encourages LID to meet water quality requirements where applicable and references the “Low Impact Development in Coastal South Carolina: A Planning and Design Guide” (LID Manual). For further information on LID BMPs see (Appendix G). This section of the SWDM outlines specific LID design requirements for the City as well as some constraints on the design criteria contained in the LID Manual.

The purpose of the LID Manual is to improve stormwater management through LID implementation by providing engineering tools, planning guidance, and case study examples that are relevant to the South Carolina coastal zone. The LID Manual is divided into five chapters and provides additional resources in the appendices.

1. Chapter 1 of the LID Manual introduces LID terminology and discusses the need for LID guidance in coastal South Carolina. The benefits of LID can reach a wide spectrum of stakeholders.
2. Chapter 2 of the LID Manual provides a background on pertinent regulations and guidelines related to LID, in addition to strategies for local governments on how to incorporate LID.
3. Chapter 3 of the LID Manual focuses on conservation principles, neighborhood site design, and landscaping practices.
 - A. Application of these principles and design considerations discussed in Chapter 3 may be limited. LID must comply with the City of North Myrtle Beach’s zoning regulations. The City of North Myrtle Beach 2018 Comprehensive Plan (Appendix H), shall be used for guidance

in planning and implementing projects in focus areas. Reference the Future Land Use Map & Compliance Index, provided in Appendix B of the Comprehensive Plan, for future land use districts.

B. The following zoning districts are most applicable for LID: Conservation Community (CC), Resource Protection and Conservation (RPC), and Planned Development District (PDD). Currently, PDD is the only zoning district adopted. CC and RPC would need adoption by the City’s Planning Commission and City Council. Much of the undeveloped land in the City is shown as CC and RPC on the Future Land Use Map and it is expected that these tracts will be developed under a negotiated PDD.

4. Chapter 4 of the LID Manual provides design requirements and specifications for a variety of stormwater BMP’s that can be incorporated as part of a low impact site design. The following table outlines some of the design criteria for each BMP included in the LID Manual as well as specific design requirements for the City.

| LID BMP | City of North Myrtle Beach Design Criteria |
|--------------------|---|
| Bioretention | <ul style="list-style-type: none"> • CDA: Up to 5 acres, but no more than 2 acres of impervious area • The City requires that all bioretention areas must have an underdrain <ul style="list-style-type: none"> ○ The Enhanced Design configuration without an underdrain is not an acceptable option for the City • Acceptable bioretention filter media: <ul style="list-style-type: none"> ○ 75-85% medium to coarse washed sand <ul style="list-style-type: none"> • Washed river sand and concrete/masonry sand are acceptable ○ 15-25% organic material <ul style="list-style-type: none"> • Organics shall be compost material that is well decomposed, stable, weed free, and does not include manure or biosolids • Compost shall be derived from leaves, yard debris, wood waste, food waste, or other organic materials • Do not use manure-based mushroom compost • US Composting Council Seal of Testing Assurance (STA) compost is preferred ○ Sand and organic material shall be uniformly mixed together • A list of acceptable plants for bioretention is provided in Appendix I. |
| Permeable Pavement | <ul style="list-style-type: none"> • CDA: Up to 1.5 times the surface area of the permeable pavement • The City requires that all permeable pavement systems must have an underdrain <ul style="list-style-type: none"> ○ The Infiltration Design configuration is not an acceptable option • The City requires that a frame and grate be installed on the downstream end of the gravel bed within all permeable pavement systems to provide conveyance for emergency overflow. |

| LID BMP | City of North Myrtle Beach Design Criteria |
|--|---|
| Infiltration - Infiltration Trench | <ul style="list-style-type: none"> • CDA: Up to 5 acres, but no more than 2 acres of impervious area for a single Infiltration Trench. |
| Infiltration - Infiltration Basin | The City does not allow the use of Infiltration Basins to meet water quality requirements. |
| Green Roof | The City of does not allow the use of Green Roofs to meet water quality requirements. |
| Rainwater Harvesting | The City does not allow the use of Rainwater Harvesting to meet water quality requirements. |
| Disconnection | <ul style="list-style-type: none"> • CDA: Up to 1,000 SF per downspout |
| Open Channels - Grass Channel | <ul style="list-style-type: none"> • CDA: Up to 5 acres |
| Open Channels - Dry Swale (Bioswale) | <ul style="list-style-type: none"> • CDA: Up to 5 acres • Acceptable dry swale filter media: <ul style="list-style-type: none"> ○ 75-85% medium to coarse washed sand <ul style="list-style-type: none"> • Washed river sand and concrete/masonry sand are acceptable ○ 15-25% organic material <ul style="list-style-type: none"> • Organics shall be compost material that is well decomposed, stable, weed free, and does not include manure or biosolids • Compost shall be derived from leaves, yard debris, wood waste, food waste, or other organic materials • Do not use manure-based mushroom compost • US Composting Council Seal of Testing Assurance (STA) compost is preferred ○ Sand and organic material shall be uniformly mixed together |
| Open Channels - Wet Swale | The City does not allow the use of Wet Swales to meet water quality requirements. |
| Open Channels – Two-Stage Ditch | The City does not allow the use of Two-Stage Ditches to meet water quality requirements. |
| Open Channels – Regenerative Stormwater Conveyance | The City does not allow the use of Regenerative Stormwater Conveyances to meet water quality requirements. |
| Filtration | The City does not allow the use of Filtration to meet water quality requirements. |
| Dry Ponds (Detention Basins) | <ul style="list-style-type: none"> • CDA: No limit |

| LID BMP | City of North Myrtle Beach Design Criteria |
|---------------------------------------|---|
| Wet Ponds (Retention Basins) | <ul style="list-style-type: none"> • CDA: Minimum CDA to pond surface area ratio of 10:1 • Permanent Pool Depth: 4 – 8 feet • The City encourages the use of aeration systems in wet ponds. It is recommended that an aeration specialist is consulted to provide design guidance for an aeration system specific to the wet pond. • When fountains are utilized for aeration, the following criteria should be considered: <ul style="list-style-type: none"> ○ Fountains are not applicable in wet ponds with a permanent pool volume smaller than 30,000 cubic feet. ○ The fountain should draw its water from less than 2 feet below the permanent pool. ○ Separated units (where the nozzle, pump and intake are connected by tubing) may be used only if they draw water from the surface in the deepest part of the pond. ○ The falling water from the fountain should be centered in the pond, away from the shoreline. ○ Pond banks should have erosion prevention measures installed to minimize bank erosion from fountain wave action. ○ The maximum horsepower for the fountain’s pump is based on the permanent pool volume. |
| Stormwater Wetlands | <ul style="list-style-type: none"> • CDA: Greater than 10 acres • The City requires that all constructed stormwater wetlands shall have a baseflow. |
| Manufactured Treatment Devices (MTDs) | <ul style="list-style-type: none"> • The City allows MTDs as an acceptable practice for meeting the water quality requirement. • Design MTDs in accordance with the SCDOT Supplemental Technical Specification: SC-M-815-13 (or latest version) for Stormwater Manufactured Treatment Devices. • Acceptable MTDs are listed on the SCDOT Qualified Product List (QPL) 99. |

5. Chapter 5 of the LID Manual includes LID case studies from the South Carolina coastal region.
6. The LID Manual Appendices provide additional resources, including maintenance checklists for post-construction BMPs and guidance for using the LID compliance calculator spreadsheet.
 - A. The compliance calculator spreadsheet is a design tool for designers to analyze the effectiveness of multiple LID BMP options and check them against the state water quality design requirements. The City approves the compliance calculator spreadsheet as an acceptable method of verification for meeting the water quality requirements.
 - B. Guidance that explains how to use each of the worksheets in the compliance calculator spreadsheet can be found in Appendix A of the LID Manual. The spreadsheet is available to download at <http://www.northinlet.sc.edu/lid/>.

3.2.8 Infiltration BMP Requirements and Soil Testing

1. Design

- A. The minimum design storage volume is equal to 1-inch of runoff from the impervious surface of the contributing drainage area.
- B. Design infiltration BMPs to completely drain within 24 to 72 hours.
- C. Infiltration BMPs are limited to soils having an infiltration rate of at least 0.30 inches per hour. Infiltration rates must be verified by site soil test results.
- D. Infiltration BMPs shall be designed for the prevention of clogging by fine materials and for ease of cleaning with conventional sewer cleaning equipment. This may include but not necessarily be limited to wrapping of the infiltration BMP (perforated pipes/chambers/trenches) with an appropriate fabric and providing a sufficient number of clean outs for the system. Underground infiltration BMPs shall be designed to have a water quality device at all inlets to the underground system to minimize sediment buildup within the main infiltration system.
- E. Systems shall have an overflow to a positive drainage system with a control device, if necessary, between the subsurface system and the positive drainage system. The overflow pipe shall be sized for the allowable discharge.

2. Soil Testing – Infiltration Rates

- A. Soil testing for infiltration rates shall be performed by a registered licensed geotechnical engineer.
- B. The initial test elevation location shall be at the same contour elevation as the bottom/invert of the infiltration BMP.
- C. Infiltration BMPs shall be designed on the basis of actual test data. Tests shall be consistent as to soil conditions, proposed infiltration BMP elevations, infiltration BMP locations and water table depths with the proposed infiltration BMP system.
- D. The following tests are allowable to determine infiltration rate for soils (Other test methods must be approved by City):
 - i. Laboratory Permeameter Test for saturated hydraulic conductivity on undisturbed soil samples (ASTM D 5084).
 - ii. Double Ring Infiltrometer Test to estimate the initial vertical unsaturated permeability data of the upper soil layer (ASTM D 3385).
 - iii. Constant Head Test in soils with permeability that allow keeping the test hole filled with water during the field test (AASHTO T 215).
 - iv. Falling Head Test in areas with excellent soil percolation where keeping the test hole filled with water is not feasible during the test.

SECTION 4 INSPECTIONS

4.1 Construction Inspections

Inspections shall be conducted by qualified personnel. For projects that disturb more than two (2) acres, “qualified personnel” means a person knowledgeable in the principles and practice of erosion and sediment control who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity. This person must be either the preparer of the C-SWPPP or an individual who is under the direct supervision of the preparer of the approved C-SWPPP and who meets the requirements in this paragraph or an individual who has been certified through the Certified Erosion Prevention and Sediment Control Inspector (CEPSCI) program that has been approved by SCDHEC. Inspections may also be conducted by a person with a registration equivalent to the registration of the preparer of the C-SWPPP and who meets the qualifications of this paragraph or an individual who is under the direct supervision of the person with an equivalent registration and who meets the requirements in this paragraph.

For projects that disturb two (2) acres or less and that are not part of a Larger Common Plan, the Permittee or his designee may perform these inspections provided the preparer of the C-SWPPP explains the C-SWPPP including implementation along with the inspection requirements to the person who will be conducting the inspections.

After construction begins, inspections shall be conducted at least once every calendar week and after one (1) inch of rainfall. Inspection frequencies for portions of the construction site that have reached temporary or final stabilization may be reduced to at least once every month, as long as the stabilization is maintained and there is no additional disturbance in these areas. Once a definable area has reached final stabilization, mark on the OS-SWPPP and no further inspection requirements apply to that portion of the Site. Inspection of common BMPs, such as sediment basins, sediment traps, may be required to resume if areas that drain to them become disturbed during future construction. If the entire site has reached final stabilization and a NOT is not submitted, continue to perform monthly inspections.

The City, on a case-by-case basis, may require any Permittee to conduct inspections on a more frequent basis than prescribed. Examples include, but are not limited to, Permittees who have compliance problems and Permittees with stormwater discharges to environmentally sensitive waters. The City may require on a case-by-case basis that the Permittee submit a monthly report summarizing the inspections at the site and any associated maintenance activity.

Inspections shall include all areas of the site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation. Inspectors shall look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Sedimentation and erosion control measures identified in the OS-SWPPP shall be observed to ensure proper operation. Inspect all discharge locations to ascertain if erosion prevention and sediment control measures are effective in minimizing sediment discharges from the site. Where discharge locations are inaccessible, nearby

downstream locations shall be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.

Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may limit the access of inspection personnel to the areas described above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls shall be inspected on the same frequencies as other construction projects, but representative inspections may be performed. For representative inspections, personnel shall inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described above. The conditions of the controls along each inspected 0.25-mile segment may be considered as representative of the condition of controls along that reach extending from the end of the 0.25-mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the project, whichever occurs first. Representative inspections shall include any areas where stormwater discharges to Waters of the State or US..

Permittees shall maintain an on-site rain gauge during active construction, to record rainfall records from any significant rainfall event, 0.5 inches or greater. These recorded rainfall amounts shall be maintained in a Rain Log located in the OS-SWPPP. Rainfall records for the day of an inspection and any significant rainfall events since the last inspection shall be reported on each weekly inspection report.

For each inspection required above, an inspection report, provided in Appendix J shall be completed. At a minimum, the inspection report shall include:

1. The inspection date and duration of inspection (arrival and departure times).
2. Names, titles, and, if not previously given in an inspection report, the qualifications of personnel making the inspection, unless those qualifications change.
3. All discharge points.
4. Weather information and a description of any discharges occurring at the time of the inspection.
5. Total rainfall since last inspection.
6. Location(s) of discharges of sediment or other pollutants from the site.
7. Location(s) of BMPs that need maintenance.
8. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location.
9. Location(s) where additional BMPs are needed that did not exist at the time of inspection.
10. Corrective action required including any changes to the OS-SWPPP necessary and implementation dates.
11. Site name, operator name and permit number.
12. Verification that all BMPs and stormwater controls identified in the OS-SWPPP have been installed and are operating as designed.

13. Determine whether or not the construction sequence is being followed.
14. Status of corrective actions undertaken following previous inspection to include date(s) each item was addressed.
15. List of items that have carried over from previous inspection reports that were not addressed.

A record of each inspection and of any actions taken in accordance with this section shall be retained as part of the C-SWPPP for at least three years from the date that permit coverage expires or is terminated. The report shall be signed in accordance with §122.22 of SC Regulation 61-9.

If inspection responsibilities are not shared between the Primary and Secondary Permittees, each Secondary Permittee must provide their own inspections for the portions of the site for which their coverage includes. Inspectors employed by the Primary Permittee retain the authority to inspect, report, and document areas of the construction site that are under direct control of the Secondary Permittee, but only when a lack of compliance by the Secondary Permittee inhibits the Primary Permittee's ability to maintain compliance with the overall OS-SWPPP.

4.2 Construction Maintenance

All BMPs and other protective measures identified in the OS-SWPPP shall be maintained in effective operating condition. If construction site inspections identify BMPs that are not operating effectively, maintenance shall be performed within seven (7) calendar days, before the next inspection, or as reasonably possible, and before the next storm event whenever practicable to maintain the continued effectiveness of the BMPs. If the required maintenance takes longer than 7 days, documentation as to the reason shall be provided along with estimated time of completion.

If periodic inspection or other information indicates that a BMP has been used inappropriately, or incorrectly, the Permittee shall address the necessary replacement or modification required to correct the BMP within a time frame of forty-eight (48) hours of identification. If existing BMPs need to be modified or if additional BMPs are necessary, implementation shall be completed before the next storm event whenever practicable. If implementation before the next storm event is impracticable, the situation shall be documented in the OS-SWPPP and alternative BMPs shall be implemented as soon as reasonably possible.

Remove deposited sediment from sediment traps or sedimentation basins when the design capacity has been reduced by fifty (50) percent or the sediment has reached the clean out point on the cleanout stake (whichever occurs first).

Remove deposited sediment collected by sediment control measure (silt fence, check dams, sediment tubes, etc.) when the deposited sediment reaches one-third (1/3) the height of the above-ground portion of these BMPs, or before it reaches a lower height based on the manufacturer's specifications.

If sediment escapes the construction Site, off-site accumulations of sediment should be removed to minimize off-site impacts unless access to the off-site property cannot be reasonably obtained from the property owner or it is determined that it is appropriate to leave the off-site accumulations in place. The permittee must contact either the MS4 or DHEC to assist with the determination.