C-0. Minimum Design Criteria for all SCMs

Design Objective

This chapter contains Minimum Design Criteria (MDC) that apply to all Stormwater Control Measures (SCMs). These MDC will apply to each and every SCM that is planned for the project. Additional MDC will be required depending on the specific type of SCM being proposed. See Part C of this Manual for SCM-specific requirements.

Important Links

Rule 15A NCAC 2H .1050. MDC for All Stormwater Control Measures

GENERAL MDC 1. SIZING.
The design volume of SCMs shall take into account the runoff at build out from all surfaces draining to the system. Drainage from off-site areas may be bypassed. The combined design volume of all SCMs on the project shall be sufficient to handle the required storm depth.

See Part B of this Manual for information on how to calculate the volume of stormwater runoff. The required storm depth may vary depending on which stormwater program is applicable to a given project. The specific required storm depth is provided in each of the program rules. For example, Rule 15A NCAC 02H .1021(6) requires that for projects designed to achieve runoff treatment, the required storm depth is one inch for non-coastal HQW and ORW management zones.

GENERAL MDC 2: CONTAMINATED SOILS.
SCMs that allow stormwater to infiltrate shall not be located on or in areas with contaminated soils.

Some SCMs that allow water to infiltrate include: infiltration systems, bioretention cells, permeable pavement, and depending upon native soils, vegetated swales, level spreader-filter strips, and berms.

Information on contaminated soils can be found at:

- NC DEQ Division of Waste Management Brownfields Program: http://deq.nc.gov/about/divisions/waste-management/brownfields-program
- US EPA Brownfields: https://www.epa.gov/brownfields

GENERAL MDC 3: SIDE SLOPES.
Side slopes of SCMs stabilized with vegetated cover shall be no steeper than 3:1 (horizontal to vertical). Retaining walls, gabion walls, and other engineered surfaces may be steeper than 3:1. Steeper vegetated slopes may be considered on a case-by-case basis if the applicant demonstrates that the soils and vegetation shall remain stable.

When steeper vegetated slopes are proposed, the applicant should take into account safety and ease of maintenance. Establishing vegetation is more difficult on steep slopes. The applicant should be able to demonstrate that suitable vegetation will be chosen and that they have a plan for maintaining the vegetation. Erosion control structures may need to be used in combination with vegetation on steep slopes.

GENERAL MDC 4: EROSION PROTECTION.
The inlets SCMs shall be designed to protect the SCM from erosion resulting from stormwater discharges. The outlets of SCMs shall be designed so that they do not cause erosion immediately downslope of the discharge point during the peak flow from the 10-year storm event as shown by engineering calculations.

Guidance on inlet and outlet protection can be found in Chapter 6, Section V. Outlet Protection & VI Inlet Protection of the NC Erosion and Sediment Control Planning and Design Manual:

http://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-permit-guidance/erosion-sediment-control-planning-design-manual

GENERAL MDC 5: EXCESS FLOWS.
SCMs shall include an overflow or bypass device for inflow volumes in excess of the treatment volume, or, if applicable, the peak attenuation volume.

Recommend checking with county or municipality concerning local flood control or stormwater quantity control requirements.

GENERAL MDC 6: DEWATERING.
SCMs shall have a method to draw down any standing water to facilitate maintenance and inspection.

Recommend pumping down wet ponds and wetlands rather than using a drawdown orifice at the invert to avoid discharging sediment.

GENERAL MDC 7: CLEAN OUT AFTER CONSTRUCTION.
Every SCM impacted by sedimentation and erosion control during the construction phase shall be cleaned out and converted to its approved design state.

Recommend having installed SCM's inspected and cleaned after each heavy rainfall in addition to inspection at the completion of the construction phase. Additional recommendations for Construction are contained in Part A of this Manual.

GENERAL MDC 8: MAINTENANCE ACCESS.
Every SCM installed pursuant to this Section shall be made accessible for maintenance and repair. Maintenance accesses shall:
(a) have a minimum width of ten feet;
(b) not include lateral or incline slopes that exceed 3:1 (horizontal to vertical); and
(c) extend to the nearest public right-of-way.

For SCMs that may require the use of large equipment for maintenance, such as wet ponds, a width of 25 feet is recommended for maintenance access. Direct maintenance access to the forebay should be provided for SCMs which utilize a forebay. Access for cleaning underdrain piping should be provided for SCMs which utilize underdrains.

GENERAL MDC 9: EASEMENTS.
All SCMs and associated maintenance accesses on privately owned land except for those located on single family residential lots shall be located in permanent recorded easements. The SCM shall be shown and labeled within the easement. These easements shall be granted in favor of the party responsible for enforcing the stormwater program under which the SCMs were approved.

SCMs must have access and maintenance easements to provide the legal authority for inspections, maintenance personnel and equipment. The location and configuration of easements must be established during the design phase and should be clearly shown on the design drawings. The entire footprint of the SCM system must be included in the access and maintenance easement, plus an additional ten or more feet around the SCM to provide enough room to complete maintenance tasks. This SCM system includes the side slopes, forebay, riser structure, SCM device, and basin outlet, dam embankment, outlet, and emergency spillway.

In addition to the provisions required by Rule, it is recommended that maintenance easements specify who may make use of the easement and for what purposes. Where feasible, it is also recommended that SCMs be posted with conspicuous signage stating who is responsible for required maintenance and annual inspection. Signage should be maintained so as to remain visible and legible.

GENERAL MDC 10: SINGLE FAMILY RESIDENTIAL LOTS.
Plats for residential lots that contain an SCM shall include:
(a) the specific location of the SCM on the lot;
(b) a typical detail for SCM to be used; and
(c) a note that the SCM on the property has been required to meet stormwater regulations and that the property owner may be subject to enforcement actions if the SCM is removed, relocated, or altered without prior approval.

DEQ recommends including, specific maintenance requirements/schedule for lots containing an SCM on the plat. The owner should maintain a copy of maintenance requirements and a log of maintenance activities that indicates the dates of each maintenance visit and the specific activities that were performed on those dates. Additional recommendations for Single Family Residential Lots are contained in Part E of this Manual.

GENERAL MDC 11: OPERATION AND MAINTENANCE AGREEMENT.
The owner of the SCMs shall enter into a binding Operation and Maintenance (O&M) Agreement with the party responsible for implementing the stormwater program under which the SCMs were approved. The O&M Agreement shall require the owner to maintain, repair, or reconstruct the SCMs in accordance with the approved design plans and the O&M Plan. The O&M Agreement shall be referenced on the final plat and shall be recorded with the county Register of Deeds upon final plat approval. If no subdivision plat is recorded for the site, then the O&M Agreement shall be recorded with the county Register of Deeds so as to appear in the chain of title of all subsequent purchasers.

It is recommended that the O&M agreement require the owner or owners of the SCM to grant a right of entry in the event that the state or local permitting authority has reason to believe it has become necessary to inspect, monitor, maintain, repair or reconstruct the SCM. In no case shall the right of entry, of itself, confer an obligation on the state or local permitting authority to assume responsibility for the SCM.

Where SCMs are to be owned and maintained by a homeowners' association, property owners' association, or similar entity, it is recommended that the O&M agreement include the following provisions:

(a) an acknowledgement that the association shall continuously operate and maintain the stormwater control and management facilities; and

(b) establishment of an escrow account which can be spent solely for sediment removal, structural, biological or vegetative replacement, major repair, or construction of the SCM;

Additional recommendations for O&M agreements are contained in Part A of this Manual.

GENERAL MDC 12: OPERATION AND MAINTENANCE PLAN.
There shall be an O&M Plan for every project subject to this Rule. The O&M Plan shall specify all operation and maintenance work necessary for the function of all SCM components, including the stormwater conveyance system, perimeter of the device, inlet(s), pretreatment measures, main treatment area, outlet, vegetation, and discharge point. The O&M plan shall specify methods to be used to maintain or restore the SCMs to design specifications in the event of failure. O&M plans shall be signed by the owner and notarized. The owner shall keep maintenance records and these shall be available upon request by the party responsible for enforcing the stormwater program under which the SCMs were approved.

The long-term effectiveness of any structural BMP relies, above all, on appropriate maintenance. It is recommended that you use the O&M EZ form to create one O&M agreement for an entire site. For your convenience, only the cover page has to be signed and notarized. Additional recommendations for O&M plans are contained in Part A of this Manual.

GENERAL MDC 13: SCM SPECIFIC MINIMUM DESIGN CRITERIA (MDC).
Every SCM shall follow the applicable device specific MDC pursuant to Rules .1051 through .1062 of this Section.

It is recommended that you use the Supplement-EZ form to create one master supplement form for the entire project. The Supplement-EZ form has been updated to reflect the new general MDC and SCM-specific MDC. Additional recommendations for SCM-specific MDC is contained in Part C of this Manual.

GENERAL MDC 14: SCM DESIGNER QUALIFICATIONS FOR THE FAST-TRACK PERMITTING PROCESS.
For the fast-track permitting process as set forth in Rules .1043 and .1044 of this Section, SCMs and components of SCMs shall be designed by persons licensed under Chapters 89A, 89C, 89E, or 89F of the General Statutes.

NCGS 89A Landscape Architects:
http://www.ncleg.net/enactedlegislation/statutes/pdf/bychapter/chapter_89a.pdf

NCGS 89C Engineering and Land Surveying:
http://www.ncleg.net/enactedlegislation/statutes/html/bychapter/chapter_89c.html

NCGS 89E Geologists Licensing Act:
http://www.ncleg.net/enactedlegislation/statutes/html/bychapter/chapter_89e.html

NCGS 89F North Carolina Soil Scientist Licensing Act:
http://www.ncga.state.nc.us/EnactedLegislation/Statutes/PDF/ByChapter/Chapter_89F.pdf

GENERAL MDC 15: NEW STORMWATER TECHNOLOGIES.
Applicants shall have the option to request Division approval of new stormwater technologies and associated MDC. Division approval shall be based on engineering calculations and research studies demonstrating that the new technology functions in perpetuity and is equally or more protective of water quality than the requirements of this Section.

Refer to Part F of this Manual for additional guidance on requesting approval of new stormwater technologies.

GENERAL MDC 16: NO EXCEPTIONS TO UNAUTHORIZED PROFESSIONAL PRACTICE.

This Rule creates no exceptions to the unauthorized practice of the professions described in Chapters 89A, 89C, 89E, or 89F, or the rules, standards, or codes of professional conduct promulgated by the applicable professional licensing boards.

Licensed professionals designing stormwater control systems and components of stormwater control systems must adhere to the general statutes under which they are licensed. This includes following the applicable Code of Professional Conduct adopted by the governing licensing board. Requirements for affixing professional seals on soils reports, hydrogeologic evaluations, landscaping plans, engineering plans, and other documents involved in the practice of a licensed profession as required by the applicable governing licensing board must be followed. The permitting authority may request proof of licensure from applicants engaging in these types of professional activities.