05.00 STORMWATER MANAGEMENT

05.01 GENERAL

05.01.01 STORMWATER MANAGEMENT PRACTICES

1. Stormwater Management practices shall be utilized in accordance with Chapter 159 Stormwater Management Ordinance of the City Code.

2. The Developer and his Engineer shall be responsible for meeting the requirements of the City of Monroe Stormwater Management Ordinance for stormwater control and ensure that the proposed development does not cause off-site flooding, drainage, or erosion problems.

05.01.02 EXEMPTIONS

1. Certain activities are exempt from this division in accordance with the requirements of Chapter 159 Stormwater Management Ordinance of the City Code.

05.01.03 RIGHT OF ENTRY

1. The City Engineer or their designee shall have right-of-entry to the property of any person in accordance with the requirements of the City of Monroe Stormwater Management Ordinance and any permit/document issued under said Ordinance.

05.01.04 STORMWATER MANAGEMENT PLAN REQUIREMENTS

1. A stormwater management plan and separate stormwater maintenance agreement in accordance with the requirements of the City of Monroe Stormwater Management Ordinance shall be submitted to the City of Monroe Engineering Department.

2. A professional, as defined in Standard 01.04, Note 1, licensed in the State of North Carolina, shall sign and seal any structural stormwater management improvement required by the City of Monroe Stormwater Management Ordinance.

3. The following information shall be included on all plans:

   A. Indicate the name of Watershed (i.e., Stewarts Creek, Richardson Creek or Bearskin Creek) if applicable, for the proposed site development;

   B. Show the existing impervious coverage, if any, and note the square footage;

C. Show the proposed impervious coverage, and note the square footage;

D. Area(s) to be disturbed or denuded and note the acreage;

E. List the NRCS soil types and characteristics;

F. Show existing and proposed stormwater collection facilities (pipes, channels, swales, catch basins, etc.) proposed layouts, connections to existing systems, and applicable easements;

G. Label stormwater structure attributes (pipe size, channel / swale dimensions, materials, inverts and rim elevations, slopes and structure types (grate inlet, manhole, etc.);

H. Label the amount of drainage area and runoff quantities that discharge onto site;

I. If the site was previously approved or part of a subdivision that was previously approved by the City of Monroe for stormwater management provide the name of the plan and the date that the plan was approved;

J. Show the location of all streams and drainage ways that require buffers;

K. Show buffers and where measured from (that is, top of bank, top of steep slopes adjacent to stream, or edge of wetlands);

L. Label the dimensions and restrictions within the buffer (that is, to remain undisturbed, % impervious allowed, vegetated, etc.);

M. Show the location of jurisdictional waters and wetlands;

N. Indicate proposed location of stream crossing(s) showing the proposed grading and overall stream impact (includes culvert and outlet protection length);

O. Show and note FEMA-regulated floodway or non-encroachment area on property, and show and note the 100-year flood limits, if applicable;

P. For sites located within FEMA Special Flood Hazard Areas:

1) Note the finished floor/flood proofing elevations of all structures;
2) Note that no encroachment/development into FEMA-regulated floodway is permitted except as specifically listed in the Flood Damage Prevention Ordinance;

3) If a FEMA-designated floodway or non-encroachment area does not exist on the property/parcel, note the nearest distance to a FEMA-designated floodway, if within 2,000 feet.

05.01.05 STORMWATER MANAGEMENT IMPROVEMENTS AND MAINTENANCE

1. The City may withhold issuance of a building certificate of occupancy until the satisfactory completion of any and all required and approved structural stormwater management improvements, as allowed by the Stormwater Management Ordinance.

2. No release of bond guaranteeing the improvements shall be allowed prior to completion of any and all required and approved structural stormwater management improvements.

3. No streets shall be accepted for public maintenance prior to completion of any and all required and approved structural stormwater management improvements.

4. Any and all access and/or maintenance easements shall be in accordance with the City of Monroe Stormwater Management Ordinance.

5. The Developer shall submit as-built drawings that include all permanent stormwater management practices associated with and constructed in the development. Refer to Standard 07.13 AS-BUILT DRAWING CHECKLIST.

6. Prior to acceptance of a permanent stormwater management facility, the applicant must submit an Operation and Maintenance Plan Agreement. An example of this agreement may be found on the City's website. Official Operation and Maintenance Plan Agreement forms shall be obtained by the Developer from the City of Monroe Engineering Department.

05.02 STORMWATER CONTROL MEASURES (SCMs)

05.02.01 DESIGN CRITERIA

1. Stormwater SCMs shall be designed and installed in accordance with the NCDEQ Stormwater Manual. Minor modifications to the details may be acceptable to accommodate individual site conditions, with details placed on the plan and reviewed for approval by the Engineering Department as part of the plan approval process.

2. Stormwater SCMs for water quality shall be designed in accordance with NCDEQ Stormwater Design Manual, latest edition which is available for downloading at the following website: https://www.deq.nc.gov

3. Stormwater SCM(s) for flood control shall be designed utilizing the NRCS method, TR-55 method, or other standard practice methods, subject to approval from the City Engineer, and must demonstrate that post-development stormwater discharge rate is less than or equal to the pre-existing discharge rate in accordance with the standards of of the Stormwater Management Ordinance.

05.02.02 CONSTRUCTION PROJECT PROVISIONS FOR SCM STRUCTURES

1. Construction of the SCM(s) shall be completed in strict compliance with the approved plans unless otherwise approved by the Professional of Record and the City Engineering Department. Approval of the drawings indicate that the Professional of Record has demonstrated to the City Engineering Department that the proposed construction is in accordance with the Monroe Stormwater Management Ordinance and the NCDEQ guidelines for primary and secondary SCM design. Deviations from the approved stormwater SCM design plan cannot be altered in the field without prior approval.

2. Prior to the start of construction, an on-site Pre-Construction Meeting must be held with the Professional of Record and the City Construction Inspector. The contractor is responsible for arranging this meeting. Contact the City of Monroe Engineering Department at 704-282-4515.

3. Periodic inspections of the construction will be performed by the City Engineering Department. The City's Construction Inspector is to be contacted a minimum of 48 hours prior to the start of construction.

4. The owner and his contractor are responsible for insuring all methods of construction are in accordance with standard practice of the industry.

5. Dam and Embankment Construction.

   A. The stormwater SCM and dam area shall be cleared, grubbed and stripped of all vegetative material and topsoil prior to dam construction. The disposal of trees, stumps, construction debris, vegetative material, etc., shall not be permitted in the dam or pool area of the pond. When blasting is used to remove rock from the pool area, the blasted area shall be over-excavated to a depth of at least two feet (2') below finish grade and brought back to finish grade with clean, relative impervious soil material compacted in place. The use of a liner is strongly recommended for all pond construction or other BMPs impounding water as part of their design due to prior problems with pond construction and leakage.

B. Soil materials used for earth fill which are highly permeable or which exhibit significant shrink/swell or dispersion shall not be used in the embankment unless specific detailed design report from a soil's engineer is submitted as part of the plan approval.

C. A cutoff trench (core trench) shall be provided with a minimum width of four feet (4'). The centerline of the cutoff trench shall be aligned with the centerline of the dam. The cutoff trench shall be carefully backfilled with highly impermeable material and compacted at least 95% of standard proctor density.

D. Slopes shall not be steeper than 3:1 (three horizontal to one vertical) on the dam or embankments around the pond.

E. Embankments shall be properly compacted to 95% of the standard proctor density.

F. All disturbed areas and embankments surrounding the ~~pond~~ stormwater BMP shall be mechanically stabilized or have permanent ground cover established upon completion of construction.

G. The outlet control structure and outlet pipe shall be constructed to maintain water tightness at all joints.

6. Final acceptance of the stormwater SCM construction by the City Engineer will be contingent upon the following:

A. All items as listed in Section 07.12, "Post-Construction Checklist for Stormwater SCM" have been satisfactorily completed.

B. A certification has been received from the Professional of Record that the stormwater BMP construction has been completed in accordance with the approved plans and specifications.

C. The Construction Inspector has verified that the stormwater SCM(s) has been constructed in accordance with the approved plans and specifications.

D. Deviations from the approved plans or deficiencies in construction must be addressed prior to the final inspection of the stormwater BMP and outlet structure by the City Engineering Department.

E. Prior to release of the certificate of occupancy, the applicant must present an as-built survey of the property prepared and sealed by a Professional Land Surveyor, Professional Engineer, or Architect licensed by the State of North Carolina. Such as-built survey shall show the location and dimension of all impervious coverage and

the total amount of impervious coverage built as a percentage of the total site. The as-built survey shall also verify stormwater BMP construction, including but not limited to permanent pool elevation, spillway elevation, top of bank elevation, depth, and surface area. The certificate of occupancy shall not be released if the impervious coverage of the site exceeds that allowed by the permit issued.

7. Revisions to the approved drawings due to field conditions are to be initiated by the owner and his contractor through the Professional of Record and will require approval from the City Engineer. The Construction Inspector does not have the authority to approve revisions or waive requirements identified by the approved plans or the City of Monroe Standard Specifications and Detail Manual.

05.03 STREAM PROTECTION AND BUFFER ZONES

1. Perennial streams may not be channelized or piped, except as approved by the City of Monroe in accordance with Chapter 159 of the Stormwater Management Ordinance. All applicable federal and state permits and certifications must be obtained prior to approval by the City.

2. Buffer zones and widths shall be in accordance with Chapter 159 of the Stormwater Management Ordinance.

05.04 OTHER PRACTICES

1. In lieu of installing primary SCMs, the Engineer may opt to combine various secondary SCMs to achieve the same required treatment capacity as the primary SCM, in accordance with the NCDEQ Stormwater Design Manual, latest edition, subject to approval from the City. All SCM(s) must meet all local, state, and federal watershed and stormwater management regulations.

2. Any proposed proprietary SCMs shall be designed and installed according to the manufacturer’s guidelines and may be approved by the City Engineer on a case by case basis.