City of Naples

JUNE 16, 2021

STORMWATER STANDARDS HANDBOOK

Adopted as Exhibit A to Ordinance 2021-___

City of Naples Stormwater Standards Handbook

TABLE OF CONTENTS

SECTION	PAGE
Section. 1: PURPOSE AND INTENT	1
Section 2: DESIGN STANDARDS AND REFERENCES	2
Section 3: CREDIT AND SURCHARGE REGULATIONS	3
Section 4: CREDIT POLICY	4
Section 5: PERMIT APPLICATION SUBMITTAL REQUIREMENTS	5
Section 6: PLAN REVIEW AND APPROVAL PROCESS	8
Section 7: CONSTRUCTION INSPECTION, CERTIFICATION, AND APPROVAL PROCESS	8
Section 8: EXAMPLE CALCULATIONS	9

SECTION 1: PURPOSE AND INTENT

1. This Stormwater Standards Handbook (hereinafter referred to as "Handbook") was developed with the express intent of guiding the community in the implementation of the City's stormwater ordinance requirements. The general goals of the stormwater requirements are to protect adjacent properties from stormwater flooding during and after re-construction and new construction and to improve the quality of stormwater runoff. During the implementation of these requirements over time, there will be added community benefits by improved control of stormwater runoff within the City's swale system, reduced street flooding, increased retention systems on private property with more stormwater percolating into the ground water, and improved pre-treatment of stormwater on both public and private property.

2. The City of Naples stormwater ordinance and implementation thereof is generally intended to meet the following:

    a. Preserve the interest of public health, safety and welfare;
    b. Increase flood protection for public and private properties;
    c. Maximize the effectiveness of long-term stormwater maintenance and operations by the City;
    d. Minimize the cost burden of long-term stormwater maintenance and operations;
    e. Avoid or minimize adverse environmental impacts;
    f. Maximize the level of service and integrity of the City's stormwater systems; and
    g. Provide for best management practices (BMPs) in the future development of property within the City.

3. Accordingly, the purpose of this Handbook is to provide stormwater regulations, standards, procedures, and requirements for implementation of the stormwater ordinance in the best interest of the public and for the protection of public and private property.

4. Revisions to this Handbook will be at the discretion of the City of Naples City Council upon the recommendation of the City Manager’s designated representative with advertised notifications to the public as may be required by law.

5. This Handbook, inclusive of attached drawings, illustrations and all specified standards and specifications may be amended and supplemented in content and frequency in the best interest of the public.

SECTION 2: DESIGN STANDARDS AND REFERENCES

Stormwater plans will be prepared to meet the standards established in ~~the Stormwater~~ Ordinance 2021- ~~with t~~The engineering design and plans for proposed stormwater improvements will conform~~ing~~ with the most recent ~~current~~ editions of the following standards, and as may be amended from time-to-time.~~, adopted by reference herein:~~ In the event of a conflict amongst any standard, the more restrictive standard will apply.

i. ~~Rules and regulations by the South Florida Water Management District, the Florida Department of Environmental Protection and related state and federal agencies.~~
~~ii.~~ City policies, standards and specifications such as the City of Naples Right-of- Way Standards and the Utilities/Engineering Manual of Standards and Specifications for water, sewer and reclaimed water mains.
iii. ~~State of Florida Department of Transportation (FOOT) Design Standards For Design, Construction, Maintenance And Utility Operations on The State Highway System.~~
~~iv.~~ Florida Accessibility Code.
~~v. FOOT Manual on Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways.~~
~~vi. FOOT Standard Specifications for Road and Bridge Construction.~~
vii. Operating and maintenance policies and standards established by the City's Public Works Director and Community Services Director.
viii. Operating standards and/or procedural processes established by resolution by the City of Naples City Council.
ix. Applicable City of Naples subdivision regulations.
~~x.~~ City of Naples Comprehensive Plan.
~~xi. Manual on Uniform Traffic Control Devices (MUTCD) latest edition, published by the U.S. Department of Transportation.~~
~~xii. FOOT Utility Accommodation Manual.~~
xiii. Other pertinent technical literature or documents representing professional standards of practice in various design disciplines.

~~In the event of a conflict between two or more of the reference documents listed above or amongst any other design documents or references, the more restrictive provision or document will apply and remain in full force and effect. If engineering design criteria or construction standards for construction of a proposed facility or improvement are not explicitly contained in said reference documents or if unique or special circumstances warrant, the City Manager's designated representative is directed to include necessary supplemental provisions or regulatory requirements as part of special permit conditions or stipulations which will then become a formal attachment to a right-of-way construction permit. Moreover, a~~At the discretion and sole authority of the City Manager's designated representative, special permit conditions or stipulations may require entry into a formal agreement to be executed by the City of Naples City Council to ensure that public property such as drainage infrastructure, utilities and other facilities are afforded the highest level of adequate protection and are modified or expanded appropriately for the safe operation and maintenance of the public stormwater systems and other public infrastructure as may be appropriate.

SECTION 3: CREDIT AND SURCHARGE REGULATIONS

The following stormwater management system (system) regulations will apply to notifications from the City to a property owner, inspections of systems, corrective actions related to defective systems, and stormwater utility fee credits and surcharges. These regulations will be in accordance with Section 30-340 of the code of ordinances.

1. Routine Inspection:
   Routine inspections will be required by the City, Property owners will receive a written notification of a required inspection, but no more often than once within a five (5) year period. The inspection must be completed by a Florida licensed professional. Completion of the inspection, and correction of any deficiencies found during the inspection, must be documented by the licensed professional within ninety (90) days of the date of the written notification. If a property owner fails to submit the required documentation to the City, a surcharge will be applied to the next stormwater utility bill. A time extension for correction of any deficiencies may be granted for good cause shown.
2. Credit Inspection:
   A property owner with an approved stormwater utility bill credit must have the stormwater management system inspected by a Florida licensed professional on or before every three (3)~~every third~~-year anniversary after the approval of the credit. Completion of the inspection, and correction of any deficiencies found during the inspection, must be documented by the licensed professional. If the property owner fails to submit the required documentation to the City, the credit will be discontinued. Credits may be approved for implementing best management practices provided in Section 4 of this handbook.
3. Verified Problem Inspection:
   When the City verifies a problem with ~~complaint, violation, or nuisance regarding~~ a stormwater management system, the owner of the system will receive a written notification from the City with a detailed description of the verified problem. The stormwater management system owner must have the system inspected and the verified problem corrected within thirty (30) days from the date of the written notification. Completion of the inspection, and correction of the verified problem, must be documented ~~as certified~~ by a Florida licensed professional. If the property owner fails to submit the required documentation to the City, a surcharge will be applied to the next stormwater utility bill.~~An inspection report documenting the certification will be provided to the City. If no corrective action is taken, a surcharge will be applied on the next stormwater utility bill.~~ A time extension for corrective of the verified problem may be granted for good cause shown.
   ~~The City may will require a routine inspections of a stormwater management system that does not have an approved utility bill credit, nor has a verified problem. The owner of the system will receive a written notification of the required inspection.~~
4. Problems are defined as complaints, deficiencies, violations, and nuisances. They include, but are not limited to: (1) a stormwater management system that has not been inspected after receiving written notification; (2) a stormwater management system that has fallen into disrepair and no longer functions as designed; (3) a stormwater management system has been altered to its detriment; (4) a stormwater management system that is adversely impacting adjacent, or downstream, properties.

5. Surcharges will be imposed by the City Manager's designated representative when no action is taken by the owner of the stormwater management system to correct a verified complaint, violation, or nuisance. Surcharges will continue until the complaint, deficiency, violation, or nuisance has been corrected and certified by a Florida licensed design professional.
6. An adjustment or exemption to a surcharge may be requested in accordance with Section 30-339 of the code of ordinances.

SECTION 4: CREDIT POLICY

On the date of adoption of this Handbook, certain properties will receive a stormwater utility fee credit. After adoption of this Handbook, properties receiving the credit will continue to receive the credit until the three (3) anniversary inspection expires. At that time, the credit will be discontinued. Once the credit is discontinued, properties will be eligible for a BMP credit.

Properties that implement the following ~~The~~ eligible best management practices (BMPs), ~~which follow in Section 6~~ may ~~be eligible to~~ receive a credit onto the property's stormwater utility bill (bill). A combination of these BMPs may be used, each eligible for a credit onto the bill. The total approved credit onto the bill will be no greater than twenty-five (25) percent. A Florida licensed professional will determine the percent credit for each BMP and submit the requested credit to the City for review and approval. BMPs within the public right-of-way are encouraged, must be approved with a right-of-way permit, and may be eligible for a credit. An adjustment to an approved credit may be requested in accordance with Section 30-339 of the code of ordinances.

~~SECTION 5: BEST MANAGEMENT PRACTICES~~

1. Extra Storage Volume: Retention systems, exfiltration trenches (subsurface retention systems), and detention systems designed and constructed to exceed the requirements of Section 16-115 of the code.
2. Permeable Pavement System: Driveways and sidewalks within the front-yard setback using a permeable pavement system, as defined in Code Section 16-51.
3. Rainwater Harvesting: Rain barrels or cisterns.
4. Treatment Swale: A common treatment swale on a joint lot line.
5. Rain Gardens: A depressed landscape area planted with deep rooted Florida Friendly™ plants.
6. Bioswales: A treatment swale planted with deep rooted Florida Friendly™ plants.
7. Native Landscaping: The City encourages native or Florida-Friendly Landscaping™ as defined by the University of Florida Institute for Food and Agricultural Sciences. Florida-Friendly Landscaping™ may be used in all areas of the property, in addition to rain gardens and bioswales.
8. Other BMPs: Other innovative BMPs may be found at the South Florida Water Management District Best Management Practices for South Florida Urban Stormwater Management Systems; the Pinellas County Stormwater Manual; the Clean Water Services Low Impact Development Approaches (LIDA) Handbook (Hillsboro, Oregon); and other appropriate resources. These BMPs will be reviewed by the City on a case-by-case basis.

SECTION 5: PERMIT APPLICATION SUBMITTAL REQUIREMENTS

For the development; remodeling or redevelopment; or substantial improvement of platted properties in the City of Naples, the following stormwater information will be submitted as part of building and/or site development permitting:

PROPERTY INFORMATION:

1. Property survey (purpose: confirm location, existing conditions/improvements, corner monuments, easements, flood zone, FIRM, etc.)
2. Boundary and ROW survey (purpose: confirm adjacent properties, ROW information, etc.)
3. Topographic information (purpose: confirm land contours for site, adjacent properties, ROW and downstream drainage flow/outfall).
4. Site plan of proposed building improvements with directional allocation of roof runoff.
5. Soil survey information to confirm water table and previous nature of soil layers.

DRAINAGE CONVEYANCE INFORMATION:

6. Drainage conveyance routing sketch showing site runoff directions and runoff percentages.
7. Drainage conveyance capacity analysis calculations based on the developed site using the 25-Year/1-Day storm event (8.5 inches over 24-hours [hydrograph mass distribution to be provided for the peak in terms of discharge rate and elapsed time]).
8. Drainage calculations on total rainfall-runoff (purpose: determine capacity of conveyance system to handle total runoff and identify backwater elevation data).
9. Drainage calculations for maximum staged elevation, and design containment system for this elevation (purpose: collection and conveyance system will prevent discharge onto adjacent property).

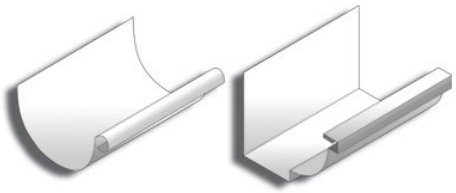
DRAINAGE STORAGE/WATER QUALITY INFORMATION:

10. Site drawing of the planned project confirming the pervious and impervious areas and the relative imperviousness for detention and/or retention systems (purpose: identify the typeof water quality treatment, applicable BMP and capacity)
11. Water quality storage calculations for initial runoff and for the selected required BMP.
12. Stormwater storage capacity calculation for stormwater system (purpose: confirm design meets City code)
13. All construction activities must comply with Code Section 16-291, Construction Site Management. In particular paragraph (d) is noted: Grading Plan; Grading and Surface Water Management Standards.

SIZING OF RESIDENTIAL GUTTERS AND DOWNSPOUTS:

14. Gutter sizing will be submitted for review as required by Code Section 16-115. Gutter sizing guidance is provided in Supplement A of this Handbook. Supplement A will be made available from the City's Streets and Stormwater Department.

~~Required Minimum Gutter Sizes~~		
~~Total Roof Area (ft^2)~~	~~Half-Round~~ -	~~K-Style~~ -
~~≤ 1,200~~	~~5-inch~~	~~5-inch~~
~~≤ 1,800~~	~~6-inch~~	~~5-inch~~
~~> 1,800~~	~~not approved~~	~~5-inch~~
~~≤ 2,600~~	~~n/a~~	~~5-inch~~
~~≤ 3,700~~	~~n/a~~	~~6-inch~~
~~≤ 4,800~~	~~n/a~~	~~7-inch~~
~~> 4,800~~	~~n/a~~	~~8-inch~~



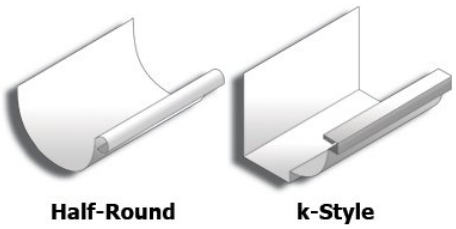
Half-Round **k-Style**

~~Downspouts will be sized to carry the capacity of the gutters and are recommended to be installed every 40 feet as a minimum.~~

~~Project contractors may propose an alternative gutter design; however, the design must follow the most recent standards of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA).~~

~~The following gutter sizing calculations are provided as guidance.~~

- ~~Calculate the square footage of the gutter's drainage area. For a simple gable-end roof, make a calculation for each slope. For roofs with multiple facets, add up the total surface area within the drainage area.~~
- ~~Determine the roof pitch factor.~~
  - ~~12 in 12 or higher the pitch factor is 1.3~~
  - ~~9 in 12 the pitch factor is 1.2~~
  - ~~6 in 12 the pitch factor is 1.1~~
  - ~~4 in 12 to 5 in 12 the pitch factor is 1.05~~
  - ~~Flat to 3 in 12 the pitch factor is 1.0~~
- ~~The maximum rainfall intensity for Naples is 7.8 inches per hour.~~
- ~~Calculate the adjusted square footage. Example: A 1,000 square foot roof, with a 6 in 12 pitch factor of 1.1, and a rainfall intensity of 7.8 inches per hour yields an adjusted square footage of 8,580. (1,000 * 1.1 * 7.8 = 8,580)~~
- ~~Choose the required gutter for the adjusted square footage.~~
  - ~~5-inch K-Style 5,520 square feet~~
  - ~~6-inch K-Style 7,960 square feet~~
  - ~~5-inch Half-Round 2,500 square feet~~
  - ~~6-inch Half-Round 3,840 square feet~~



~~Half-Round~~ ~~k-Style~~

- ~~For runoff that exceeds the capacity of standard gutters three options are available.~~
  - ~~Increase the size of the gutters to 7 or 8 inches.~~
  - ~~Increase the pitch of the gutter to greater than the standard ¼ inch per 10 feet.~~
  - ~~Install additional downspouts above the recommended every 40 feet.~~
- ~~Downspouts are recommended to be installed every 40 feet as a minimum. Downspout capacity is as follows:~~
  - ~~Rectangular 2 by 3 inches = 600 square feet~~
  - ~~Rectangular 3 by 4 inches = 1,200 square feet~~
  - ~~Round 3 inches = 706 square feet~~
  - ~~Round 4 inches = 1,255 square feet~~

PROFESSIONAL DESIGNS:

Project contractors will be held responsible to provide engineering designs and related designs that meet professional standards of practice and review processes as designated herein. Review and inspection fees as defined in Appendix A of the code will be paid upfront as part of the plan submittal process.

SECTION 6: PLAN REVIEW AND APPROVAL PROCESS

For the development of platted properties in the City of Naples, the following stormwater design criteria, plan submittal and approval process will be relied upon for building and/or site development permitting:

DESIGN REVIEW CRITERIA:

1. All plans submitted to the City will be reviewed for compliance with the City of Naples Stormwater Ordinance including this Handbook.
2. Design criteria for review are as set-forth in the SFWMD, FDEP, FDOT and City of Naples standards.
3. Examples of typical standards are outlined as follows:
   a. Minimum subsurface pipe size: 8"
   b. Maximum subsurface pipe size: 10" in side and back-yard areas
   c. Minimum yard slope: 2%
   d. Maximum yard slope: 8% unless stabilized
   e. Minimum pipe slope: none
   f. Drainage materials: as specified by the Florida licensed professional
   g. Underdrain design: as specified by the Florida licensed professional
   h. ROW Swale design: Public Right-Of-Way Construction Standards Handbook
   i. Gutter Size: refer to above Section 7
   j.

SECTION 7: CONSTRUCTION INSPECTION, CERTIFICATION, AND APPROVAL PROCESS

For permitted stormwater management systems, permitted building improvements, and/or permitted site improvements, the following outline of inspection, certification and approval will be followed.

INSPECTION AND CERTIFICATION:

1. The property owner, or the owner's designated representative, will be responsible for contacting the City to request all required inspections, including:
   - 238 "underground retention" – in progress inspection
   - 240 "stormwater drainage" - final stormwater
   - 297 "site residential final" – record survey, engineer's certification
   - 299 "site final" – site sodded and stabilized
2. The City will conduct all required inspections to certify that the stormwater management system improvements have been constructed in accordance with the approved plans and the stormwater development code.
3. All connections to the City stormwater system will be subject to an underground retention and/or in progress site inspection. Connection will proceed only after a satisfactory inspection.

4. All stormwater management system components will be subject to an underground retention, in progress site inspection. Backfilling and other site work will proceed only after a satisfactory inspection.
5. When a stormwater system has been backfilled, or where other site work has been completed, prior to a required inspection, the stormwater system will be re-excavated and/or the site work will be removed before the City will conduct the inspection.
6. All swales within the public right-of-way are subject to a right-of-way permit and must be maintained throughout the duration of construction. Right-of-way swales may be inspected by the City and correction of any deficiencies will be required.
7. All stormwater management systems will be subject to a site final inspection. Approval of the site will be subject to a satisfactory inspection by the City.
8. System layout, pipe diameter and length, cross-sections, elevations, materials, and all other relevant system components will be confirmed by:
   - The City's site final inspection.
   - The submittal of a record survey of the adjacent right-of-way signed and sealed by a Florida licensed professional land surveyor that the drainage facilities, including swales, are capable of receiving and conveying stormwater.
   - The submittal of a certification by a Florida licensed professional that the stormwater system was satisfactorily completed in accordance with the plans and specifications.
9. Final approvals and/or issuance of certificates of occupancy by the City will not be processed until the completion of all inspections, certifications, and the record drawings.

SECTION 8: EXAMPLE CALCULATIONS

Example site calculations for ~~permitted~~ stormwater management systems are provided in Supplement A of this Handbook. Supplement A will be made available from the City's Streets and Stormwater Department. ~~provided below:~~