First Reading
Agenda Item
5/5/2021

ORDINANCE 2021-

AN ORDINANCE RELATING TO STORMWATER; AMENDING CHAPTER 16, PROVIDING FOR CONSTRUCTION, REHABILITATION AND PROPERTY MAINTENANCE REGULATIONS, AMENDING ARTICLE II, ADMINISTRATION, DIVISION 2, SECTION 16-51 DEFINITIONS; ARTICLE III BUILDING AND TECHNICAL CODES; AMENDING SECTION 16-115, STORMWATER CONSTRUCTION STANDARDS; AMENDING CHAPTER 30 ARTICLE VI STORMWATER MANAGEMENT AMENDING SECTION 30-339 ADJUSTMENT OF STORMWATER FEES; AMENDING CHAPTER 30, ARTICLE VI, SECTION 30-340 STORMWATER CREDITS AND SURCHARGES; ADOPTING NEW SEC. 30-344 CREATING A STORMWATER STANDARDS HANDBOOK; ADOPTING NEW CHAPTER 30, ARTICLE VIII, SECTIONS 30-400 THROUGH 30-420 PROHIBITING ILLICIT STORMWATER DISCHARGES AND CONNECTIONS, PROVIDING FOR MONITORING, BEST MANAGEMENT PRACTICES, WATERCOURSE PROTECTION, SPILL NOTIFICATION, ENFORCEMENT, ABATEMENT, VIOLATIONS, REMEDIES, PENALTIES, AND COSTS; PROVIDING FOR SEVERABILITY; PROVIDING FOR REPEAL OF ORDINANCES IN CONFLICT; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Naples City Council determined that it is in the City's best interest to amend the City of Naples Stormwater Code requirements;

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF NAPLES, FLORIDA:

Section 1. That Section 16-51, Definitions, of the Code of Ordinances, City of Naples, is hereby amended to read as follows (with underlining indicating additions and ~~strikethrough~~ indicating deletions):

Chapter 16 – CONSTRUCTION, REHABILITATION AND PROPERTY MAINTENANCE REGULATIONS.

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ARTICLE II. – ADMINISTRATION

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DIVISION 2. – BUILDING FEES

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Sec. 16-51. – Definitions.

The following words, terms, and phrases, when used in this article, will ~~shall~~ have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Accessory structures (type I) are nonhabitable structures that normally have a roof and a measurable floor area, or ground surface area, e.g. gazebos, sheds, chickees, boathouses, swimming pools, etc.

Accessory structures (type II) are nonhabitable structures that usually do not have a roof and a measurable floor area, e.g. fences, signs, driveways, sidewalks, exterior screen walls, etc.

As-built survey is a survey, signed and sealed by a Florida licensed professional land surveyor, of existing site infrastructure and improvements to obtain dimensional and vertical data, so that constructed improvements may be located and delineated. The survey is carried out during, or immediately after, a construction project for the record, completion evaluation, and payment purposes. For a stormwater management system, the as-built survey will include, but is not limited to the elevations, heights, depths, and locations of: (1) discharge structures; (2) grates; (3) inverts; (4) walls; (5) berms; and (6) swales.

Best Management Practices (BMPs) are schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Commercial means all other occupiable areas that are not classified as residential, including multifamily residential.

Detention facility is a facility used to temporarily store stormwater runoff and rainfall that recovers its storage volume by the controlled release of water through designed drawdown structures and mechanisms (see "retention facility" for contrast.)

Florida licensed professional means an engineer licensed by the Florida Board of Professional Engineers, an architect licensed by the Florida Board of Architecture and Interior Design, a landscape architect licensed by the Florida Board of Landscape Architecture, or a land surveyor licensed by the Florida Board of Surveyors and Mappers.

Gross square footage is the total square footage of the structure measured to the outside of the exterior walls, or column lines where there are no walls. This is the same as the building footprint. Where the structure contains multiple floors (stories), the gross square footage is calculated to include the area of all floors (stories).

Impact fees are charges assessed and collected on newly developed property by local governments. The intent of the fee is to recover the cost incurred by providing public amenities required for the new development.

Impermeable~~ility~~ is the relative inability of a material to allow the flow of water to pass through the material, typically associated with solid surfaces that prohibit rainfall or both rainfall and rainfall runoff from entering and passing through the material.

Impervious means impenetrable or impermeable by water.

Impervious area means the percentage of the lot land area covered by impervious surfaces such as buildings or structures, swimming pools, decks, lanais, patios, driveways, and also includes any surface covered by concrete, bricks, blocks, flagstones, paving, sealant, or any other impermeable material. Standard engineering coefficients of permeability will ~~shall~~ be used for partially pervious materials.

New development includes both development and new construction as defined in §16-144.

Occupiable areas are, for the purpose of this article, defined as any enclosed space that can be occupied by humans. This would include every square foot of floor area under the same roof of residential and commercial buildings computed to the outside of the exterior walls, or column line for areas without exterior walls, of the structure. In a residential structure this would include attached garages, detached garages, carports, storage rooms, etc.

Paved areas are any exterior areas covered with human-made or natural materials to provide a walking ~~and/~~or vehicle traversing surface. ~~as opposed to real grass or other vegetation. Materials could include but shall not necessarily be limited to concrete, asphalt, brick, stone, and astro-turf type surfaces.~~

Penalty fees are additional fees imposed upon the project for failure to comply with certain requirements of this article.

Permeable/Pervious both mean to allow water to pass through.

Permeable/Pervious/Porous pavement materials are human-made or natural materials that are designed to have spaces or holes that allow water to pass through and are used to provide a walking or vehicle traversing surface. Examples of human-made materials include, but are not limited to, porous (pervious) asphalt, pervious concrete, permeable pavers, and porous pavers.

Permeable pavement system is a pavement system designed by a Florida licensed professional engineer to infiltrate and store rainfall and stormwater runoff while also supporting vehicular or pedestrian traffic. Permeable pavement systems generally include up to five material layers: (1) a surface of permeable pavement materials; (2) a gravel bedding coarse; (3) a stone choker coarse; (4) a stone reservoir base coarse; and (5) a soil subgrade with an infiltration rate of no less than 2-inches per hour to allow for percolation.

Permit fees means monies collected for the processing of permits and operation of the building and zoning division.

Plan review fees are fees collected at the time an application for a permit is submitted to the building and zoning division to cover the cost of reviewing the plans and specifications for code compliance. This fee will be charged for all construction projects involving habitable structures and accessory structures where plans have to be submitted.

Porous means having minute spaces or holes through which liquid or air may pass.

Residential means one- or two-family units of occupiable areas.

Retention facility is a facility used to store stormwater runoff and rainfall that recovers its storage volume only when the water evaporates, transpirates, or percolates from the facility.

Re-development is any construction activity on a site where the aggregate of actions ~~and/~~or costs to reconstruct, modify, alter, or improve the property, whether in one phase or in multiple phases, are anticipated to do any of the following: (1) increase the ~~appraised~~ market value of the ~~property~~ structure, as defined in §16-144, more than 50 percent of its current ~~appraised~~ market value: (2) replaces the existing building or reconstructs more than 50 percent of the area under existing roof; (3) raises more than 50 percent of the existing finished floor; (4) modifies the existing site grading sufficiently to warrant concern that the new activities could ~~create problems for offsite~~ adversely impact downstream or adjacent property; (5) modifies the existing site resulting in an increase in stormwater runoff; or (6) increases the impervious area on the site by greater than 250 square feet.

Substantial improvement will be as defined in §16-112 and in the Florida Building Code.

Surcharge fees are additional fees imposed by some level of government to be used for some specific purpose.

Temporary use permits are permits issued for special activities or events that do not meet local zoning requirements. These permits are issued for a specific time period determined by the building official based on the applicant's request.

Section 2. That Section 16-115, Stormwater construction standards, of the Code of Ordinances, City of Naples, is hereby amended to read as follows (with underlining indicating additions and ~~strikethrough~~ indicating deletions):

Chapter 16 – CONSTRUCTION, REHABILITATION AND PROPERTY MAINTENANCE REGULATIONS.

. . .

ARTICLE III – BUILDING AND TECHNICAL CODES

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Sec. 16-115. – Stormwater Construction Standards.

(a) This section does not apply to:
  (1) Properties with an existing permitted and properly functioning stormwater management system, unless an activity on the property requires a new construction permit;
  (2) Properties regulated by the Florida Department of Environmental Protection or the South Florida Water Management District; or
  (3) Historic buildings as defined in §16-116, provided any activity on the historic building will not preclude the building's continued designation as a historic building.

(b) Any activity on a property that requires an application for a new construction permit, an addition or alteration permit, a driveway permit, a site work permit, or a pool permit that will be reviewed by the city manager to determine whether the activity constitutes new development, redevelopment, or substantial improvement as defined in §16-51.

(c) Any new development, redevelopment, or substantial improvement of a property must comply with the minimum stormwater design technical criteria, special conditions, and special criteria below:

  (1) Minimum Stormwater Design Technical Criteria:

    a. Water Quantity/Conveyance Criteria:

      1. All design calculations will begin with determining the runoff from the entire area of the bounded property limits. This is the water quantity/conveyance calculation.

      2. A design flow storm event of a one-hour duration and a five-year return frequency will be used in computing the minimum off-site discharge rate

and the size of the discharge pipe, post treatment, from private properties to the city's stormwater system.

3. The stormwater conveyance system will be designed sufficiently so that the conveyance will pass the design flow storm event while ensuring that the backwater head does not exceed the proposed berms, walls, or other containment systems in a 25-year, 24-hour storm event.
4. The side lot swales and other emergency conveyance facilities may be designed to pass the water forward to the public right-of-way for storm events exceeding the five-year, one-hour event.

b. Water Quality/Storage Criteria: The water quality/storage criteria are intended to meet or exceed the presumed pollutant removal efficiencies of the South Florida Water Management District (SFWMD) technical publication "Best Management Practices for South Florida Urban Stormwater Management Systems".

1. For properties that propose new development, redevelopment, or substantial improvement, the design storage volume will not be less than 0.5 inch of retention storage volume, nor less than 1.25 inches of detention storage volume when the property maintains 40 percent impervious area or less.
2. For new development, redevelopment, or substantial improvement resulting in greater than 40 percent impervious area, the design storage volume will not be less than 1.0 inch of retention storage volume, nor less than 2.5 inches of detention storage volume.

(2) Special Conditions:

a. Retention and exfiltration systems must be built over materials with an infiltration rate of no less than 2-inches per hour to allow for percolation. Compacted lime rock, and similar materials used to support structures, is not considered permeable.
b. The permeable greenspace area of a site will be included in the conveyance/quantity calculations.
c. The permeable greenspace area of a site may be disregarded from the storage/quality calculations.
d. Permeable pavement systems may be used in the design of a stormwater management system. The surface area of the permeable pavement system will be included in the conveyance/quantity calculations and will be included in the storage/quality calculations.
e. Retention systems must be designed and located no less than 12-inches above the wet season water table. Permeable pavement systems must be designed to be a minimum of 18 inches above the wet season water table.

(3) Special Criteria:

a. Plans and specifications for stormwater management systems will be signed and sealed by a Florida licensed professional and will be submitted for review and approval by the city manager prior to the issuance of a permit. The city manager will conduct inspections of stormwater improvements. Upon completion of the construction, and prior to receiving a certification of occupancy or completion, a certification with an as-built survey will be

submitted by a licensed professional stating that the work has been satisfactorily completed in accordance with the plans and specifications.

b. The public right-of-way adjacent to the property, including swales, will be re-established in accordance with the city's Right-of-Way Construction Standards Handbook.
   1. An as-built survey of the right-of-way adjacent to the property will be submitted with elevations to allow a Florida licensed professional to demonstrate that the drainage facilities, including swales, are capable of receiving and conveying stormwater. Driveway connections to the street will not impede the city's stormwater conveyance system.
   2. Work in the public right-of-way will have an approved right-of-way permit prior to construction. The city manager must inspect and approve the construction of swales, driveways, and other work performed within the public right-of-way prior to passing the stormwater final inspection and prior to closing the right-of-way permit.

c. Stormwater discharge into a platted alley is prohibited unless a drainage conveyance system exists within the alley with sufficient surplus capacity to handle the runoff proposed for discharge to the alley.

d. Roof gutters are required as an erosion control technique, as a means to prevent stormwater from adversely affecting adjacent properties, and as a means to convey stormwater to the site's stormwater treatment system. If a roof line of a building is ten feet or less from a property line, a roof gutter must be installed on that side of the building with the roof line within ten feet of the property line. If a roof line of a building is greater than ten feet from the property line, and gutters are not installed, the total volume of roof top runoff directed to any side yard must be less than 25 percent of the total roof runoff and erosion control must be adequately addressed. Roof runoff collected by gutters will be directed to the stormwater management system designed for the site. All roof gutters must be appropriately sized for the roof top receiving area. Roof gutter design calculations will be submitted for review and approval by the city manager prior to issuance of a permit for the stormwater management system. The installation of the roof gutters will be verified during a city site inspection. Roof gutter design guidelines are included in the Stormwater Standards Handbook.

e. Runoff from impervious areas on the property, including paved areas to the property line, will be directed into the on-site stormwater management system.

f. The property owner will maintain the stormwater system in accordance with the stormwater plan certified at the time of issuance of a certification of occupancy, or completion, and have the system inspected in accordance with code §30-340.

g. The city manager reserves the right to reject any BMP or innovative technique proposed to meet the goals of the ordinance if the applicant does not provide adequate assurances through a maintenance plan that the system will be effectively maintained for the life of the stormwater management system.

h. In rare instances where an existing property has elevations that will not grade back into the required stormwater master system, then as a minimum, some form of pretreatment is required before discharge to a canal, lake, bay, or other water body. Innovative BMPs will be employed to accomplish this including (but not limited to): interceptor swales, containment berms, rain gardens and interconnection into the seawall rock drain system.

~~(a) Any new development, redevelopment or substantial improvement of platted properties within the City of Naples shall be reviewed to assure compliance with the following minimum stormwater design criteria:~~

~~LAND USE~~	~~CONVEYANCE/ QUANTITY (GOAL "A")~~	~~STORAGE/ QUALITY (GOAL "B")~~
~~Single-Family~~	~~(A)~~	~~(B)~~
~~Multi-Family~~	~~(A)~~	~~(B)~~
~~Non-Residential/ Mixed Use~~	~~(A)~~	~~(B)~~

~~TECHNICAL CRITERIA NOTES:~~

~~(A) Unless otherwise specified by previous South Florida Water Management District (SFWMD) permits or district criteria, a storm event of a one-hour duration and five-year return frequency shall be used in computing the minimum off-site discharge rates from private properties to the city's stormwater system. The stormwater conveyance system should be designed sufficiently so that the conveyance shall pass the design flow while ensuring that the backwater head does not exceed the proposed berms, walls or other containment systems in a 25-year - 24-hour storm event. The side lot swales and other emergency conveyance facilities may be designed to pass the water forward to the public right-of-way.~~

~~(B) Unless otherwise specified by previous South Florida Water Management District (SFWMD) permits or district criteria, water quality standards shall be determined based upon selecting the most appropriate pollutant removal presumption to the corresponding BMP technique. The BMP guidelines used must meet a presumed pollutant removal of 85 percent Total Suspended Solids (TSS), Total Nitrogen (TN), and Total Phosphorus (TP). BMPs that do not effectively remove TN and TP such as "dry detention" will be discouraged. Innovative approaches and LID techniques that reduce percent impervious are encouraged. Although reductions in storage volume may be given to BMPs that use "retention" and exfiltration, under no circumstances will the design storage volume be allowed to be less than one-half inch of retention storage volume nor less than 1.25 inch of dry detention storage volume (based on total site area). The following special conditions shall apply in meeting the above standards: a) on single-family lots no more than one-half inch of detention or retention shall be stored underground in vaults, exfiltration pipes, or french drains; b) rainfall runoff from roof drains can be disregarded from the water quality calculations (GOAL~~

~~"B") but not from the conveyance calculations (GOAL "A") since roof water is not a major source of pollutant concern but it is a major concern for release into the public system for flooding considerations. Directly connected impervious area (DCIA) is discouraged for purposes of GOAL "A"; c) retention systems shall be designed and located no less than 18 inches above the wet season water table; exfiltration and pervious pavement shall be designed to be a minimum of 24 inches above the wet season water table; d) where special filtering materials are utilized, where swimming pools and patio areas are designed for storage or where special retention provisions are provided consistent with SFWMD criteria or consistent with Chapter 62 of the Florida Administrative Code, the building official may credit such areas in the computation of total on-site storage.~~

~~(b) All implementation of stormwater improvements shall conform to the above standards and shall include compliance with the following special criteria:~~

~~(1) Plans and specifications signed and sealed by an appropriate design professional shall be submitted for review and approval prior to the issuance of city permits. Upon completion of the construction of stormwater improvements and prior to receiving a certification of occupancy or completion, a certification with record documents shall be submitted by the design professional stating that the work has been satisfactorily completed in accordance with the plans and specifications.~~

~~(2) Establishment, re-establishment or maintenance of swales within the abutting city street right-of-way in accordance with the city's right-of-way standards handbook.~~

~~(3) Prohibition of stormwater discharge into a platted alley unless a drainage conveyance system exists within the alley with sufficient surplus capacity to handle the quantity of runoff proposed for discharge to the alley.~~

~~(4) Roof gutters are required as an erosion control technique that also follows the philosophy of reducing DCIA and shall be installed on all buildings. However, in special cases, where the side yard widths are greater than ten feet, the building official may allow an exemption as long as the roof directs less than 25 percent of the roof runoff to a side yard area, and erosion control is adequately addressed.~~

~~(5) Streets, driveways and sidewalks shall be designed to minimize potential for increasing the runoff from private property to the city's stormwater system.~~

~~(6) The property owner shall maintain the stormwater system in accordance with the stormwater plan certified at the time of issuance of a certification of occupancy. The building official reserves the right to reject any BMP or innovative technique proposed to meet the goals of the ordinance if the applicant does not provide adequate assurances through a maintenance plan that the system will be effectively maintained in perpetuity.~~

~~(c) The environmental protection of downstream water bodies is vital to this ordinance as part of GOAL "A". In rare instances where an existing property has elevations that will not grade back into the required stormwater master system, then as a minimum, the city requires some form of pretreatment before discharge to the canal, lake, bay or other water body. Innovative BMPs shall be employed to accomplish this including (but not limited to): interceptor swales, containment berms, rain gardens and interconnection into the seawall rock drain system.~~

Section 3. That Section 30-339, Adjustment of fees, of the Code of Ordinances,

City of Naples, is hereby amended to read as follows (with underlining indicating additions and ~~strikethrough~~ indicating deletions):

Chapter 30 – UTILITIES.

. . .

ARTICLE VI – STORMWATER MANAGEMENT.

. . .

Sec. 30-339. – Adjustment of fees, credits, and surcharges.

(a) Request for adjustments of or exemptions to the stormwater management utility fee may be submitted to the city manager, who is given the authority to develop and administer the procedures and standards for the adjustment or exemption of fees, credits, or surcharges. All requests will ~~shall~~ be judged on the basis of ~~the amount of impervious area on developed parcels, the total area of vacant parcels, and/or the amount of stormwater discharged from the property~~ compliance with §16-115 and §30-340. The following procedures will ~~shall~~ apply to all adjustment requests of the stormwater fee, credits, and surcharges:

(1) Any owner who has paid such owner's utility fees, credits, or surcharges and who believes the utility fee to be incorrect may, subject to the limitations set forth in this article, submit an adjustment or exemption request to the city manager.

(2) Adjustment or exemption requests for the utility fees, credits, or surcharges which have been paid by an owner will ~~shall~~ be made in writing setting forth, in detail, the grounds upon which relief is sought.

(3) The owner requesting the adjustment or exemption may be required, at such person's own cost, to provide supplemental information to the city manager, including but not limited to, survey data approved by either a registered professional land surveyor (RPLS) or ~~and~~ engineering reports approved by a professional engineer (PE). Failure to provide such information may result in the denial of the adjustment request.

(4) Adjustments or exemptions to the utility fee will be made upon the granting of the request, in writing, by the city manager. Denials of requests will ~~shall~~ be made in writing, by the city manager.

(b) Upon receipt of the written denial of the adjustment or exemption request, the owner who initially requested the adjustment or exemption may, within 15 ~~30~~ days of receipt of such denial, appeal to the city council for review of the denial.

(1) The city council will ~~shall~~ complete their review within 90 ~~30~~ days of receipt of the request for review. The city council's determination on the review will ~~shall~~ be in writing and will ~~shall~~ set forth in detail the reasons for its decisions.

(2) In reviewing denials of requests, the city council will ~~shall~~ apply the standards and review criteria contained in this section.

Section 4. That Section 30-340, Credit policy for approved stormwater management systems credits, of the Code of Ordinances, City of

Naples, is hereby amended to read as follows (with underlining indicating additions and ~~strikethrough~~ indicating deletions):

Chapter 30 – UTILITIES.

. . .

ARTICLE VI – STORMWATER MANAGEMENT.

. . .

Sec. 30-340. Credit and surcharge policy for ~~approved~~ permitted stormwater management systems ~~credits~~.

(a) The following criteria must be met by the stormwater utility customer in order to receive a credit, or to avoid a surcharge, onto the property's stormwater utility bill:
   (1) A stormwater utility bill credit may be approved by the city manager in accordance with the most recent update to the Stormwater Standards Handbook. The credit onto the stormwater utility bill will not be greater than 25 percent of the property's total stormwater utility bill.
   (2) A stormwater utility bill surcharge may be imposed by the city manager in accordance with the most recent update to the Stormwater Standards Handbook. The surcharge onto the stormwater utility bill will be 50 percent of the property's total stormwater utility bill, but not less than $100 per month.
   (3) Stormwater utility customers must complete an inspection of the stormwater management system upon written notification from the city and as required by the Stormwater Standards Handbook. The inspection will include a report signed and sealed by a Florida licensed professional. The inspection report must confirm and certify that the stormwater management system remains consistent with, and is operating according to, the permitted design requirements.

(b) A request for an adjustment to the credit or the surcharge amount may be made in accordance with § 30-339.

(c) The city does not regulate stormwater management systems that have been permitted by the South Florida Water Management District (SFWMD) or the Florida Department of Environmental Protection (FDEP). Verified complaints, violations, and nuisances on properties with state regulated stormwater management systems will be reported by the city to the appropriate state regulatory agency.

~~(a) Properties that currently operate and maintain an approved stormwater management system that is shown to reduce stormwater runoff and improve the quality of stormwater runoff are eligible for a reduction in the stormwater utility fee in the form of a credit. Stormwater utility customers with property meeting the criteria provided in this section may receive a stormwater utility fee credit of up to, but not exceeding, 30 percent on the fee for the subject property.~~

~~(b) The following criteria must be met by the stormwater utility customer in order to receive the on-site stormwater utility fee credit:~~

~~(1) The stormwater facilities have been permitted by the South Florida Water Management District or approved by the city manager.~~

~~(2) The stormwater utility customer requesting the credit demonstrates to the city manager, on or before every third year anniversary after the granting of the credit that said stormwater facilities are operating properly and being maintained according to standard practices. The demonstration shall include, at a minimum, photographs of the subject stormwater facilities during the year prior and a signed affidavit by a professional civil engineer registered in the State of Florida that the facilities have been operated properly and maintained according to standard practices.~~

Sec. 30-344. – Stormwater Handbook

The City hereby adopts the City of Naples "Stormwater Standards Handbook", attached hereto as Exhibit A, and the City may, if desired, prepare, publish, amend and update from time to time a "Stormwater Standards Handbook" that shall be adopted by Ordinance that contains stormwater management system regulations that contain design criteria and guidelines, stormwater nutrient reduction techniques and best management practices, procedures for notifications, inspections, and remedial actions related to credits and surcharges.

Section 5. That Article VIII, Illicit Stormwater Disharges and Connections, Section 30-400 through Section 30-420, is hereby added to the Code of Ordinances, City of Naples (with underlining indicating additions and ~~strikethrough~~ indicating deletions):

Chapter 30 – UTILITIES.

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ARTICLE VIII – ILLICIT STORMWATER DISCHARGES AND CONNECTIONS.

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Sec. 30-400. – Purpose and intent.

The purpose of this article is to provide for the health, safety, and general welfare of the citizens of the city through the regulation of non-stormwater discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This article establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The intent of this article is:

(a) To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by stormwater discharges by any user;
(b) To prohibit illicit connections and discharges to the municipal separate storm sewer system; and
(c) To establish legal authority to carry out all inspection, surveillance, and monitoring procedures necessary to ensure compliance with this article.

Sec. 30-401. – Definitions.

Best Management Practices (BMPs) are schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Clean Water Act means the federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

Construction Activity means activities subject to NPDES Construction Permits. Permits are required for construction projects resulting in land disturbance of one acre or more. Such activities include, but are not limited to, clearing and grubbing, grading, excavating, and demolition.

Hazardous Materials means any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illicit Discharge means any direct or indirect non-stormwater discharge (spilling, leaking, seeping, pouring, pumping, emitting, emptying, or dumping) to the storm drain system or waterbody, except as exempted in §30-406.

Illicit Connections means either of the following: any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system, including but not limited to, any conveyances that allow any non-stormwater discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by the city or, any drain or conveyance connected from a commercial or industrial land use to the storm drain system that has not been documented in plans, maps, or equivalent records and approved by the city.

Impaired Waters are defined pursuant to § 62-40.210, F.A.C., as it may be amended from time to time, which means a waterbody or waterbody segment that does not meet one or more of its designated uses due in whole or in part to discharges of pollutants, and has been listed as impaired by order of the Secretary in accordance with the procedures set forth in § 62- 303, F.A.C.

Industrial Activity are defined as businesses engaged in industrial production or

service, that is, businesses characterized by manufacturing or productive enterprise or a related service business and is subject to NPDES Industrial Permits as defined in 40 CFR, § 122.26(b)(14).

Municipal Separate Storm Sewer System or MS4 is defined as a publicly owned stormwater management system that consists of conveyances including roads with drainage systems, detention ponds, retention ponds, catch basins, curbs, gutters, ditches, man-made channels, swales, or storm drains designed or used for collecting, storing, treating, or conveying stormwater.

National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge Permit means a permit issued by EPA (or by a State under authority delegated pursuant to 33 USC § 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable to an individual, group, or general area-wide basis.

Nonpoint Source Pollution means pollution from any source other than from any discernible, confined, and discrete conveyances, and may include, but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal, and urban runoff sources such as fertilizer.

Non-Stormwater Discharge means discharge to the storm drain system that is not composed entirely of stormwater.

Person means any individual, association, organization, partnership, firm, corporation, or other entity recognized by law and acting as either the owner or as the owner's agent.

Pollutant means anything that causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; grease, non-hazardous liquid and solid wastes, and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

Premises means any building, lot, parcel of land, or portion of land whether improved or unimproved, including adjacent sidewalks and parking strips.

Storm Drainage System means publicly owned facilities by which stormwater is collected or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, swales, and other drainage structures.

Stormwater means any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation and resulting from such precipitation.

Stormwater Management System or SMS means either or both of the public or privately owned systems of conveyances including roads with drainage systems, detention ponds, retention ponds, catch basins, curbs, gutters, ditches, man-made

channels, swales, or storm drains designed or used for collecting, storing, treating, or conveying stormwater.

Stormwater Pollution Prevention Plan means a document that describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater conveyance systems, or receiving waters to the maximum extent practicable.

Wastewater means any water or other liquid, other than uncontaminated stormwater, discharged from a facility.

Watercourse means a natural or artificial channel, ditch, canal, swale, or other drainage structure made for the conveyance of water.

Sec. 30-402. – Applicability.

This article applies to all water entering the storm drain system generated on any developed and undeveloped lands unless explicitly exempted by the city.

Sec. 30-403. – Responsibility for administration.

The city will administer, implement, and enforce the provisions of this article. Any powers granted or duties imposed upon the city may be delegated by the city manager to appropriate City departments and personnel.

Sec. 30-404. – Severability.

The provisions of this article are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this article or the application thereof to any person, establishment, or circumstances will be held invalid, such invalidity will not affect the other provisions or application of this article.

Sec. 30-405. – Ultimate responsibility.

The standards set forth herein and promulgated pursuant to this article are minimum standards; therefore, this article does not imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants and additional measures may be required to maintain compliance with all provisions of this chapter or other state and federal laws and regulations.

Sec. 30-406. – Prohibitions of illegal discharges.

No person may discharge or cause to be discharged into the municipal storm drain system or waterbodies any materials other than stormwater, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards or a violation of the Municipal Stormwater Permit, or conveys significant quantities of pollutants to surface waters, or is a danger to public health or safety. The commencement, conduct, or continuance of any illegal discharge to the storm drain system or waterbody is prohibited and will be considered irreparable harm.

Exemptions.

(a) The following discharges are exempt from discharge prohibitions established by this article:
  (1) Water line flushing or other potable water sources;
  (2) Landscape irrigation or lawn watering if using potable water;
  (3) Diverted stream flows;
  (4) Rising groundwaters or springs;
  (5) Groundwater infiltration to storm drains;
  (6) Uncontaminated pumped groundwater;
  (7) Foundation or footing drains (not including active groundwater dewatering systems);
  (8) Crawl space pumps;
  (9) Air conditioning condensate;
  (10) Non-commercial washing of vehicles or boats using non-toxic, non-hazardous, biodegradable, phosphate free cleaners, if runoff is directed to an onsite stormwater management system or to a pervious surface;
  (11) Natural riparian habitat or wetland flows;
  (12) Neutralized swimming pool discharge if directed to pervious greenspace and is free of pollutants; and
  (13) Fire-fighting activities.

(b) Discharges or connections permitted by the city, provided that the discharger is in compliance with all requirements of the permit and all other applicable laws and regulations.

(c) Dye testing is an allowable discharge but requires a verbal notification to the city manager prior to the time of the test.

(d) Any non-stormwater discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order, and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

(e) Herbicide application by a licensed applicator in a manner compliant with state law, Best Management Practices (BMPs), and label instructions.

(f) The wash down of a motor vehicle accident scene and other type of emergency response. However, the wastes from the wash down must be disposed of properly by the person responsible for site rehabilitation.

(g) Permitted municipal treated wastewater or reclaimed water discharge.

(h) Larvicide application by the Collier Mosquito Control District for the protection of public health and safety against waterborne illnesses.

Prohibition of Illicit Connections.

(a) The construction, use, maintenance, or continued existence of illicit connections to the storm drain system is prohibited.

(b) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

(c) A person is considered to be in violation of this article if the person connects a line conveying sewage to the MS4 or allows such a connection to continue.

Sec. 30-407. – Suspension of MS4 access.

Suspension due to Illicit Discharges in Emergency Situations. The city may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge that presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or Waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the city manager may take such steps as deemed necessary to prevent or minimize damage to the MS4 or Waters of the United States, or to minimize danger to persons.

Suspension due to the Detection of Illicit Discharge. Any person discharging to the MS4 in violation of this article may have their MS4 access terminated if such termination would abate or reduce an illicit discharge. The city manager will notify a violator of the proposed termination of its MS4 access. The violator may petition the city for a reconsideration.

If any person fails to remove an illicit connection upon notification by the city manager, or upon revocation of a connection permit, the city manager may remove such connection from the storm drain system pursuant to § 30-415. The city manager may pursue the recovery of costs for such removal pursuant to § 30-415.

A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this section, without the prior approval of the city manager.

Sec. 30-408. – Industrial or construction activity discharges.

Any person subject to an industrial or construction activity NPDES stormwater discharge permit must comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the city prior to the allowing of discharges to the MS4.

Sec. 30-409. – Monitoring of discharges.

(a) *Applicability.* This section applies to all facilities that have stormwater discharges associated with Industrial, commercial, residential, or construction activity and will become effective if permit requirements are not being met or reasonable BMPs are not being implemented.

(b) *Access to Facilities.*

(1) The city must be permitted to enter and inspect facilities subject to regulation under this article as often as may be necessary to determine compliance with this article. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger must make the necessary arrangements to allow access to the city.

(2) Facility operators must allow the city ready access to all parts of the premises for the purposes of inspection, sampling, examination, and copying of records that must be kept under the conditions of an NPDES permit to discharge stormwater, and the performance of any additional duties as defined by state and federal law.

(3) The city will have the right to set up on any permitted facility such devices as are necessary in the opinion of the city manager to conduct monitoring and sampling of the facility's stormwater discharge.

(4) The city has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment will be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure stormwater flow and quality must be calibrated to ensure their accuracy and monitoring results must be shared with the city.

(5) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected or sampled must be promptly removed by the operator at the written or oral request of the city and must not be replaced. The costs of clearing such access will be borne by the operator.

(6) Unreasonable delays in allowing the city access to a permitted facility is a violation of a stormwater discharge permit and of this article. A person who is the operator of a facility with a NPDES permit to discharge stormwater associated with industrial activity commits an offense if the person denies the city reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this article.

(7) If the city has been refused access to any part of the premises from which stormwater is discharged, and the city is able to demonstrate probable cause to believe that there may be a violation of this article, or that there is a need to inspect or sample as part of a routine inspection and sampling program designed to verify compliance with this article or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the city manager may seek issuance of a search warrant from any court of competent jurisdiction.

(8) If a Private Stormwater Management System (SMS) discharges via the MS4 to a waterbody that is declared impaired by FDEP, or is upstream of an impaired waterbody, or the downstream waterbody has an adopted Total Maximum Daily Load, Basin Management Action Plan, or Site Specific Alternative Criteria, the discharger may be required to monitor the water at the relevant outfall at the city's discretion to determine if the discharger is meeting the established criteria and not causing any further impairment. Further, the discharger may be required to reduce the pollutant load being discharged from the private SMS to the MS4 to the greatest extent possible.

Sec. 30-410. – Best management practices to prevent, control, and reduce stormwater pollution.

The city will identify and implement Best Management Practices for activities that may cause or contribute to pollution or contamination of stormwater, the storm drain system, or waters of the U.S. The owner or operator of a commercial or industrial establishment will provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs. Further,

any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of stormwater associated with industrial activity, to the extent practicable, may be deemed compliant with the provisions of this section. These BMPs will be part of a stormwater pollution prevention plan (SWPP) as necessary for compliance with requirements of the NPDES permit.

Sec. 30-411. – Watercourse protection.

Every person owning property through which a watercourse passes, or such person's lessee, must keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee must maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

Sec. 30-412. – Spill notification.

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials that are resulting or may result in illegal discharges or pollutants discharging into stormwater, the storm drain system, or waters of the U.S., said person must take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person must immediately notify emergency response agencies of the occurrence via emergency dispatch services and the city's Code Enforcement Department. In the event of a release of non-hazardous materials, said person must notify the city manager no later than the day of occurrence. Notifications in person or by phone must be confirmed by written notice either by mail or email to the city within one business day. Follow up actions taken to remediate the spill must be included in the notification. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment must also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records must be retained for at least three years.

Sec. 30-413. – Enforcement.

Notice of Violation. Whenever the city finds that a person has violated a prohibition or failed to meet a requirement of this article, the city manager may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

(a) The performance of monitoring, analyses, and reporting;
(b) The elimination of illicit connections or discharges;
(c) That violating discharges, practices, or operations must cease and desist;
(d) The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;
(e) Payment of a fine to cover administrative and remediation costs; and
(f) The implementation of source control or treatment BMPs.

If abatement of a violation or restoration of affected property is required, the notice will set forth a deadline within which such remediation or restoration must be completed. Said notice will further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof will be charged to the violator. Violations under this article may be enforced under the code enforcement provisions of Chapter 2, Article VII. – Code Enforcement.

Sec. 30-414. – Emergency cleanup or abatement.

In order to enforce the provisions of this chapter, when the city manager finds and determines that the severity of the violation warrants immediate action to protect public health and safety, or the environment, he/she may clean up or abate violation thereof if the violator does not take immediate action. The cost of such cleanup or abatement is addressed in § 30-415 of this article. Such emergency cleanup or abatement will not relieve the person of further action, which may be taken by the city manager, including but not limited to, suspension, revocation, or modification of the discharger's permit, recovery of costs, damages and liability arising from any violations of this chapter, or any other applicable provisions of State or Federal laws, or local ordinances.

Sec. 30-415. – Violation abatement costs.

Within 30 days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within 30 days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of the time in which to file an appeal, the charges will become a special assessment against the property and will constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this article will become liable to the city by reason of such violation.

Sec. 30-416. – Injunctive relief.

It is unlawful for any person to violate any provision or fail to comply with any of the requirements of this article. If a person has violated or continues to violate the provisions of this article, the city manager may petition for a preliminary or permanent injunction restraining the person from activities that would create further violations or compelling the person to perform abatement or remediation of the violation.

Sec. 30-417. – Violations deemed a public nuisance.

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this article is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

Sec. 30-418. – Penalties.

Violation of this Chapter may be enforced by the City pursuant to City of Naples

Code, Article VII. (Code Enforcement) and Chapter 162, Parts I and II, Florida Statutes (2021), including Florida Statutes Section 162.22.

Sec. 30-419. – Remedies not exclusive.

The remedies listed in this article are not exclusive of any other remedies available under any applicable federal, state, or local law, and it is within the discretion of the city manager to seek additional remedies.

Section 7. **Severability.** It is intended by the City that if any word, phrase, clause, subsection, or section of this ordinance is for any reason held unconstitutional, invalid, or ineffective by a court of competent jurisdiction, the same shall not affect the validity of any remaining portions of this ordinance.

Section 8. **Repeal of Ordinances in Conflict.** That all sections or parts of sections of the Code of Ordinances, City of Naples, all ordinances or parts of ordinances, and all resolutions or parts of resolutions in conflict herewith, be and the same are hereby repealed to the extent of such conflict.

Section 9. **Effective Date.** This ordinance will take effect upon adoption at the Second Reading.

APPROVED AT FIRST READING AND PUBLIC HEARING THIS 5TH DAY OF MAY 2021.

SCHEDULED FOR SECOND READING AND PUBLIC HEARING IN OPEN AND REGULAR SESSION OF THE CITY COUNCIL OF THE CITY OF NAPLES, FLORIDA THE 19TH DAY OF MAY 2021.

Attest:

Patricia L. Rambosk, City Clerk

Teresa Heitmann, Mayor

Approved as to form and legality:

Nancy Stuparich, City Attorney

Date filed with City Clerk:_____

EXHIBT A

City of Naples

2021

STORMWATER STANDARDS HANDBOOK

Adopted as Exhibit A to Ordinance 2021-___

City of Naples Stormwater Standards Handbook

TABLE OF CONTENTS

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 with the engineering design and plans for proposed stormwater improvements conforming with the most current editions of the following standards, adopted by reference herein:

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, 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. A property owner with an approved stormwater utility bill credit must have the stormwater management system inspected on or before every third-year anniversary after the approval of the credit. Credits may be approved for implementing best management practices provided in Section 5 of this handbook.
2. When the City verifies a 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 verified problem corrected within 30 days from the date of the written notification, as certified by a Florida licensed professional. 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.
3. The City may require a routine inspection 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. Routine inspections will be required by the City no more often than once within a five-year period. The required routine inspection will be completed, and any deficiencies documented by the inspection, will be corrected within 90 days of the date of the written notification. If no corrective action is taken, and certification is not submitted to the City, a surcharge will be applied to the next stormwater utility bill.
4. Complaints, deficiencies, violations, and nuisances 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

The 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 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 a 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 6: PERMIT APPLICATION SUBMITTAL REQUIREMENTS

For the development, or redevelopment, 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)

SIZING OF RESIDENTIAL GUTTERS AND DOWNSPOUTS:

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 8: 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 areoutlined 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

SECTION 9: 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 10: EXAMPLE CALCULATIONS

Example site calculations for permitted stormwater management systems are provided below:

1920 Sandpiper Street

Site Data:

Building (Roof) Area:	5,194	ft^2
Pool Area:		ft^2
Pavement Area:		ft^2
Parking Area:		ft^2
Lake Area:		ft^2
Impervious Area Total	8,008	ft^2
Dry Detention Area:		ft^2
Open Space (Greenspace) Area:	2,796	ft^2
Conservation Area:		ft^2
Pervious Area:	2,796	ft^2
Total Area:	10,798	ft^2
Impervious Percentage:	74	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is greater than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.0 in	
Required Retention Volume	$V_{required}$ = (10,798 ft^2 – 2,796 ft^2) * (1.0/12) ft	
Required Retention Volume	$V_{required}$ = 667 ft^3	
Provided Retention Volume:		
Pipe Diameter D	0.83 ft	10" diameter pipe
No. of Pipes #	1	
Pipe Length L	309 ft	
Pipe Area A_{pipe}	0.545 ft^2	$A_{pipe} = [\Pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	168 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	2.50 ft	
Trench Height h	2.00 ft	
Trench Length L	309 ft	
Trench Area A_{trench}	5.00 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	551 ft^3	$V_s = (A_{trench} – A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	719 ft^3	$V_{trench} = V_{pipe} + V_s$

The provided volume exceeds the required volume. As designed, the retention system for 1920 Sandpiper Street meets the Section 16-115 criteria for water quality/storage.

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 2.5 in
Required Detention Volume	$V_{required}$ = (10,798 ft^2 – 2,796 ft^2) * (2.5/12) ft
Required Detention Volume	$V_{required}$ = 1,667 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.

3221 Fort Charles Drive

Site Data:

Building (Roof) Area:	6,390	ft^2
Pool Area:		ft^2
Pavement Area:		ft^2
Parking Area:		ft^2
Lake Area:		ft^2
Impervious Area Total	10,590	ft^2
Dry Detention Area:		ft^2
Open Space (Greenspace) Area:	9,460	ft^2
Conservation Area:		ft^2
Pervious Area:	9,460	ft^2
Total Area:	20,050	ft^2
Impervious Percentage:	53	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is greater than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.0 in
Required Retention Volume	$V_{required}$ = (20,050 ft^2 – 9,460 ft^2) * (1.0/12) ft
Required Retention Volume	$V_{required}$ = 883 ft^3

Provided Retention Volume:		
Pipe Diameter D	0.67 ft	8" diameter pipe
No. of Pipes #	1	
Pipe Length L	311 ft	
Pipe Area A_{pipe}	0.349 ft^2	$A_{pipe} = [\Pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	109 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	2.00 ft	
Trench Height h	3.50 ft	
Trench Length L	311 ft	
Trench Area A_{trench}	7.00 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	827 ft^3	$V_s = (A_{trench} – A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	936 ft^3	$V_{trench} = V_{pipe} + V_s$

The provided volume exceeds the required volume. As designed, the retention system for 3221 Fort Charles Drive meets the Section 16-115 criteria for water quality/storage.

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 2.5 in
Required Detention Volume	$V_{required}$ = (20,050 ft^2 – 9,460 ft^2) * (2.5/12) ft
Required Detention Volume	$V_{required}$ = 2,206 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.

213 9th Avenue South

Site Data:

Building (Roof) Area:	4,035	ft^2
Pool Area:		ft^2
Pavement Area:		ft^2
Parking Area:		ft^2
Lake Area:		ft^2
Impervious Area Total	8,165	ft^2
Dry Detention Area:		ft^2
Open Space (Greenspace) Area:	6,838	ft^2
Conservation Area:		ft^2
Pervious Area:	6,838	ft^2
Total Area:	15,003	ft^2
Impervious Percentage:	54	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is greater than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.0 in	
Required Retention Volume	$V_{required}$ = (15,003 ft^2 – 6,838 ft^2) * (1.0/12) ft	
Required Retention Volume	$V_{required}$ = 680 ft^3	
Provided Retention Volume:		
Pipe Diameter D	0.83 ft	10" diameter pipe
No. of Pipes #	1	
Pipe Length L	280 ft	
Pipe Area A_{pipe}	0.545 ft^2	$A_{pipe} = [\Pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	153 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	2.50 ft	
Trench Height h	2.20 ft	
Trench Length L	280 ft	
Trench Area A_{trench}	5.50 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	555 ft^3	$V_s = (A_{trench} – A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	708 ft^3	$V_{trench} = V_{pipe} + V_s$

The provided volume exceeds the required volume. As designed, the retention system for 213 9th Avenue South meets the Section 16-115 criteria for water quality/storage.

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 2.5 in
Required Detention Volume	$V_{required}$ = (15,003 ft^2 – 6,838 ft^2) * (2.5/12) ft
Required Detention Volume	$V_{required}$ = 1,701 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.

2025 Tarpon Road

Site Data:

Building (Roof) Area:	5,282	ft^2
Pool Area:		ft^2
Pavement Area:		ft^2
Parking Area:		ft^2
Lake Area:		ft^2
Impervious Area Total	7,033	ft^2
Dry Detention Area:		ft^2
Open Space (Greenspace) Area:	3,665	ft^2
Parking Area:		ft^2
Pervious Area:	3,665	ft^2
Total Area:	10,698	ft^2
Impervious Percentage:	66	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is greater than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.0 in
Required Retention Volume	$V_{required}$ = (10,698 ft^2 – 3,665 ft^2) * (1.0/12) ft
Required Retention Volume	$V_{required}$ = 586 ft^3

Provided Retention Volume:		
Pipe Diameter D	0.83 ft	10" diameter pipe
No. of Pipes #	1	
Pipe Length L	240 ft	
Pipe Area A_{pipe}	0.545 ft^2	$A_{pipe} = [\Pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	131 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	2.50 ft	
Trench Height h	2.50 ft	
Trench Length L	240 ft	
Trench Area A_{trench}	6.25 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	548 ft^3	$V_s = (A_{trench} - A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	679 ft^3	$V_{trench} = V_{pipe} + V_s$

The provided volume exceeds the required volume. As designed, the retention system for 2025 Tarpon Road meets the Section 16-115 criteria for water quality/storage.

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 2.5 in
Required Detention Volume	$V_{required}$ = (10,698 ft^2 – 3,665 ft^2) * (2.5/12) ft
Required Detention Volume	$V_{required}$ = 1,465 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.

626 3rd Street North

Site Data:

Building (Roof) Area:	6,485	ft^2
Pool Area:		ft^2
Pavement Area:		ft^2
Parking Area:		ft^2
Lake Area:		ft^2
Impervious Area Total	12,165	ft^2
Dry Detention Area:		ft^2
Open Space (Greenspace) Area:	5,260	ft^2
Parking Area:		ft^2
Pervious Area:	5,260	ft^2
Total Area:	17,425	ft^2
Impervious Percentage:	70	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is greater than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.0 in	
Required Retention Volume	$V_{required}$ = (17,425 ft^2 – 5,260 ft^2) * (1.0/12) ft	
Required Retention Volume	$V_{required}$ = 1,014 ft^3	
Provided Retention Volume:		
Pipe Diameter D	0.67 ft	8" diameter pipe
No. of Pipes #	1	
Pipe Length L	332 ft	
Pipe Area A_{pipe}	0.349 ft^2	$A_{pipe} = [\Pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	116 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	3.00 ft	
Trench Height h	2.50 ft	
Trench Length L	332 ft	
Trench Area A_{trench}	7.5 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	950 ft^3	$V_s = (A_{trench} – A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	1,066 ft^3	$V_{trench} = V_{pipe} + V_s$

The provided volume exceeds the required volume. As designed, the retention system for 626 3rd Street North meets the Section 16-115 criteria for water quality/storage.

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 2.5 in
Required Detention Volume	$V_{required}$ = (17,425 ft^2 – 5,260 ft^2) * (2.5/12) ft
Required Detention Volume	$V_{required}$ = 2,534 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.

570 Rudder Road

Site Data:

Building (Roof) Area:	6,055	ft^2
Pool Area:		ft^2
Pavement Area:		ft^2
Parking Area:		ft^2
Lake Area:		ft^2
Impervious Area Total	10,453	ft^2
Dry Detention Area:		ft^2
Open Space (Greenspace) Area:	7,566	ft^2
Parking Area:		ft^2
Pervious Area:	7,566	ft^2
Total Area:	18,019	ft^2
Impervious Percentage:	58	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is greater than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.0 in
Required Retention Volume	$V_{required}$ = (18,019 ft^2 – 7,566 ft^2) * (1.0/12) ft
Required Retention Volume	$V_{required}$ = 871 ft^3

Provided Retention Volume:		
Pipe Diameter D	0.83 ft	10" diameter pipe
No. of Pipes #	1	
Pipe Length L	230 ft	
Pipe Area A_{pipe}	0.545 ft^2	$A_{pipe} = [\Pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	125 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	3.50 ft	
Trench Height h	2.50 ft	
Trench Length L	230 ft	
Trench Area A_{trench}	8.75 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	755 ft^3	$V_s = (A_{trench} – A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	880 ft^3	$V_{trench} = V_{pipe} + V_s$

The provided volume exceeds the required volume. As designed, the retention system for 570 Rudder Road meets the Section 16-115 criteria for water quality/storage.

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 2.5 in
Required Detention Volume	$V_{required}$ = (18,019 ft^2 – 7,566 ft^2) * (2.5/12) ft
Required Detention Volume	$V_{required}$ = 2,178 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.

EXAMPLES OF EXISTING HOMES ON PROPERTIES WITH ≤ 40% IMPERVIOUS AREA

537 13th Street North

Open Space (Greenspace) Area:	3,990	ft^2
Total Area:	5,630	ft^2
Impervious Percentage:	29	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is less than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 0.5 in	
Required Retention Volume	$V_{required}$ = (5,630 ft^2 – 3,990 ft^2) * (1.0/12) ft	
Required Retention Volume	$V_{required}$ = 68 ft^3	
Provided Retention Volume:		
Pipe Diameter D	0.67 ft	8" diameter pipe
No. of Pipes #	1	
Pipe Length L	50 ft	
Pipe Area A_{pipe}	0.349 ft^2	$A_{pipe} = [\Pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	17 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	1.50 ft	
Trench Height h	2.00 ft	
Trench Length L	50 ft	
Trench Area A_{trench}	3.00 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	53 ft^3	$V_s = (A_{trench} – A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	70 ft^3	$V_{trench} = V_{pipe} + V_s$

OR: Surface retention with berms.
Berm Height = 0.50 ft Berm Length and Width = 12 ft Volume Within Berm = 72 ft^3

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.25 in
Required Detention Volume	$V_{required}$ = (5,630 ft^2 – 3,990 ft^2) * (1.25/12) ft
Required Detention Volume	$V_{required}$ = 171 ft^3

Surface detention with berms.
Berm Height = 0.50 ft Berm Length and Width = 19 ft Volume Within Berm = 180 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.

1079 6th Lane North

Open Space (Greenspace) Area:	6,591	ft^2
Total Area:	9,221	ft^2
Impervious Percentage:	29	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is less than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 0.5 in	
Required Retention Volume	$V_{required}$ = (9,221 ft^2 – 6,591 ft^2) * (0.5/12) ft	
Required Retention Volume	$V_{required}$ = 110 ft^3	
Provided Retention Volume:		
Pipe Diameter D	0.67 ft	8" diameter pipe
No. of Pipes #	1	
Pipe Length L	65 ft	
Pipe Area A_{pipe}	0.349 ft^2	$A_{pipe} = [\pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	23 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	2.00 ft	
Trench Height h	2.00 ft	
Trench Length L	65 ft	
Trench Area A_{trench}	4.00 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	95 ft^3	$V_s = (A_{trench} – A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	118 ft^3	$V_{trench} = V_{pipe} + V_s$

OR: Surface retention with berms.
Berm Height = 0.50 ft Berm Length and Width = 15 ft Volume Within Berm = 112 ft^3

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.25 in
Required Detention Volume	$V_{required}$ = (9,221 ft^2 – 6,591 ft^2) * (1.25/12) ft
Required Detention Volume	$V_{required}$ = 274 ft^3

Surface detention with berms.
Berm Height = 0.50 ft Berm Length and Width = 24 ft Volume Within Berm = 288 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.

550 13th Street North

Open Space (Greenspace) Area:	3,839	ft^2
Total Area:	5,648	ft^2
Impervious Percentage:	32	%

City of Naples RETENTION criteria for water quality/storage if the impervious percentage is less than 40%:

Required Retention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 0.5 in	
Required Retention Volume	$V_{required}$ = (5,648 ft^2 – 3,839 ft^2) * (0.5/12) ft	
Required Retention Volume	$V_{required}$ = 75 ft^3	
Provided Retention Volume:		
Pipe Diameter D	0.67 ft	8" diameter pipe
No. of Pipes #	1	
Pipe Length L	50 ft	
Pipe Area A_{pipe}	0.349 ft^2	$A_{pipe} = [\Pi(D^2/4)] * \#$
Pipe Volume V_{pipe}	17 ft^3	$V_{pipe} = A_{pipe} * L$
Trench Width w	2.00 ft	
Trench Height h	2.00 ft	
Trench Length L	50 ft	
Trench Area A_{trench}	4.00 ft^2	$A_{trench} = w * h$
Fillable Porosity f	0.40	
Volume of Void Space V_s	73 ft^3	$V_s = (A_{trench} – A_{pipe}) * f * L$
Provided Retention Volume V_{trench}	90 ft^3	$V_{trench} = V_{pipe} + V_s$

OR: Surface retention with berms.
Berm Height = 0.50 ft Berm Length and Width = 13 ft Volume Within Berm = 84 ft^3

The City of Naples criteria for water quality/storage provides an option for DETENTION. For an impervious percentage of greater than 40%, the required volume would be:

Required Detention Volume	$V_{required}$ = (Total Area – Greenspace Area) * 1.25 in
Required Detention Volume	$V_{required}$ = (5,648 ft^2 – 3,839 ft^2) * (1.25/12) ft
Required Detention Volume	$V_{required}$ = 188 ft^3

Surface detention with berms.
Berm Height = 0.50 ft Berm Length and Width = 20 ft Volume Within Berm = 200 ft^3

The City of Naples criteria for water quantity/conveyance must also be met as required in Section 16-115. The off-site discharge rate must be computed using the 1-hour, 5-year storm event. The backwater head must not exceed on-site containment systems for a 25-year, 24-hour storm event.