*For Discussion Purposes

Town of Kiawah Island Supplemental Stormwater Design Standards

Recommendation to look at stormwater management comprehensively for Kiawah Island.

Initial Phase:

- Outline and adopt framework for submittal process and Best Management Practices for intermediate intervention of stormwater management which provides the Town ability to implement supplementary standards to existing DHEC standards;
- Education campaign for the public on stormwater management, flooding and resiliency for greater understanding of issues and benefit of proposed regulatory changes;
- Coordination with established Comprehensive Marsh Management Plan Subcommittee priorities and Environmental Committee for alignment of Town goals.
- Benchmark the islands total impervious coverage through collaboration with Kiawah Conservancy

Subsequent Phases:

- Continued education campaign to the public on stormwater management, flooding and resiliency;
- Coordination with professional engineers for consistent standards and application as KICA, Charleston County and others;
- Develop and adopt more restrictive stormwater standards that address stormwater runoff quantity and stormwater runoff quality;
- Consider "end of pipe" regulatory changes strategies pertaining to stormwater management in collaboration with KICA and KIGR in review of master drainage system and plan. Noting without better understanding of existing infrastructure, capacity and patterns, wholesale changes to infrastructure requirements as drainage pipe sizing, culverts, catch basins and outfall etc are not recommended at this time;
- Advance training for staff and retention of professional engineers for review and assessment of submitted stormwater management plans;
- Restructure zoning code to consolidate stormwater management regulatory changes;
- Advance implementation of other recommendations within the Comprehensive Marsh Management Plan and Flood Mitigation and Sea Level Rise Adaptation Report.

Initial Recommendations

A. **Recommendation for Tree Preservation and Landscape Standards |** The preservation of trees and vegetation helps with the integrity and hydrologic cycle of the island which impacts stormwater runoff. The landscape standards workgroup under Phase II of Landscape and Tree Preservation Standards will consider touchpoint of landscape requirements as buffer standards, native plants etc. (*Status: Draft language is being developed for recommendation under established workgroup*)

B. **Recommendation for Pervious Paving Requirements |** The minimization of total impervious area directly relates to a reduction in stormwater runoff volume and the associated pollutants from a development site. It should be noted that no amount of pervious surface can solve the issue of tidal inundation. Included are the consideration for bioretention for parking areas. (*Status: Under Consideration for Planning Commission Recommendation)*

C. **Recommendation for Best Management Practices and Low Impact Development Strategies |** It is critical to note in improving flooding conditions, addressing stormwater at its closest source for water quality and water quantity is beneficial. The proposed regulatory changes would be applied to each individual development aiding in direct reduction of stormwater runoff. Please note that proposed recommendations are not in lieu of any state requirements or existing Town stormwater management requirements for construction activities which warrant a NPDES General Permit for discharge. Additionally permits require certain developments to develop and implement a Stormwater Pollution Prevention Plan. *(Status: Initial framework under consideration for Town Council, Planning Commission to discuss more restrictive standards.)*

Overview of Proposed Town of Kiawah Island Supplemental Stormwater Design Standards.

Charleston City, Charleston County, Town of James Island, Town of Sullivans Island are all used examples to develop framework for supplementary standards. Staff continues to engage with representatives from Kiawah Island Community Association, Charleston County Public Works, Weston & Sampson. Critical to the Kiawah supplemental standards are the consideration of natural solutions / low impact development strategies.

Addressing Water Quality

Water quality impacts should be considered when designing developments and redevelopments. Stormwater pollutants most commonly derive from nonpoint sources and are an indirect impact of land development. As stormwater runoff washes over streets and parking lots, garbage, vehicle-related chemicals, pesticides, and other debris are picked up and discharged into ponds, ditches and receiving waterbodies.

*For Discussion Purposes

Town of Kiawah Island Supplemental Stormwater Design Standards

Addressing Water Quantity

The addition of impervious surfaces and removal of vegetation are direct impacts to the disruption of the hydrologic cycle which can lead to increased stormwater runoff peak flows and total runoff volumes. The additional factors of the coast, low depth of the groundwater table and the region's terrain being generally flat can heighten the impact of flooding. The changes in water quantity can be readily visible to property owners when flood frequency, severity, and duration increase .

- *As referenced in Charleston City Stormwater Design Standards Manual*

Applicability | The Town of Kiawah Island Supplemental Stormwater Design Standards provide design requirements in addition to the SCDHEC criteria that directly affect stormwater quantity and quality control. The standards are to be implemented for all developments including single family residential, multifamily residential and commercial sites.

Rainfall and Design Storm Frequency | The 24-hour precipitation depths/intensities corresponding to various probabilities for exceedance in any given year (*Annual Exceedance Probability - AEP)* are shown in the table below and are to be used for projects within the Town. The AEP is determined using historical rainfall data within a region. These values contain a 10 percent safety factor to account for uncertainties in the design process and the increasing intensity of future storms.

Recommendations are for Kiawah to align with the Town of James Island. Both James Island and Charleston County use a higher exceedance rate for probabilities of rainfall and design storms than DHEC.

24-Hour Design Storm Precipitation Frequency (Proposed Town of Kiawah Island)							
	100%	50%	20%	10%	4%	2%	1%
Return Frequency (Year)	1-year	2-year	5-year	10-year	25-year	50-year	100-year
Precipitation (inches)	3.80	4.60	6.10	7.20	8.70	9. 90	11.30
Other Communities Benchmarked							
SCDHEC	3.80	4.30	5.50	6.60	8.00	9.20	10.40
Charleston County	3.80	4.60	5.90	7.00	8.00	8.90	10.20
James Island	3.80	4.60	6.10	7.20	8.70	9.90	11.30

[For example, a storm with a 5-year return period represents an event that is expected to be exceeded once every five years (on average). The frequency is 1/5, which means that there is a 20% probability

of a storm exceeding that magnitude occurring in any given year. Note that the return period does not mean that two storm events exceeding a given magnitude will not occur in the same year, nor does it guarantee that a storm event exceeding this magnitude will occur within any given five-year span. It just means that these storms will occur at an average rate of once every five years. The higher the return period, the more infrequent the storm event, and the higher the intensity of the rainfall." - Bentley Drainage and Utilities CONNECT Edition]

Baseline Stormwater Management Design Standards

The Town's typical impervious coverage is 33%. If a proposed development's impervious area exceeds 33%, the runoff volume from a 25-year, 24- hour storm event shall be retained on site for the impervious area above 33%. [*For example, if the impervious area for a new home site is 36.8% of the total property, the site must retain the 25-year, 24-hour storm runoff volume for 3.8% of the total property area on site.]*

Additional considerations:

1) Consideration for delineation between single family residential and non-single family residential or commercial developments. Regarding applicability to all developments on island, single family residential remains the highest development impact.

2) Considerations for redevelopment standards (existing developments compared to undeveloped properties) Kiawah is approximately under 10 years regarding buildout. (Avg. 55 SFR new homes per year since 2020; 543 vacant SFR lots)

Stormwater Management Best Practices and Low Impact Development | *The Charleston County Stormwater Technical Manual 2nd edition for Best Management Practices* provides a range of options for designers to address stormwater runoff from a water quality and quantity standpoint. To improve stormwater management on Kiawah, the recommendation is for sites to implement at least one or combination of the following performance standards:

Impervious Coverage Reduction

Reduce the impervious coverage so that the impervious coverage is less than 33% ensuring the impervious cover does not exceed resulting in additional measures to retain runoff from a 25-year, 24-hour storm on site.

Runoff Reduction Requirements

All sites of less than a half-acre (21,780 square feet) with an increase of 500 square feet or more impervious area, shall offset the increase in runoff through implementation of runoff reduction

practices. Runoff reduction practices include disconnected downspouts, rain garden, infiltration trench, rain barrels etc. Please note reduction practices below which encourage the use of Natural Solutions.

Consideration for distinguishing new development and redevelopment standards

Reduction Practice	Requirement
Disconnect Downspouts from Impervious areas or Piped systems	500 sf of impervious area allowed per 500 sf pf roof area disconnected.
Install Rain Barrel	500 sf of impervious area per 50-gallon rain barrel installed at downspout. Rain Barrel shall be adequately screened from view.
Install Rain Garden	500 sf of impervious area allowed per 50sf of rain garden installed.
Install Infiltration Trench	1' deep x 2' wide trench filled with clean coarse sand along each side of surface features such as driveways or patios with no more than 15 feet of linear unit area flowing to the feature.

Reduction of Peak Discharge Rates:

Developments shall achieve a 20% reduction of the existing peak discharge rates at the time of submittal of a stormwater management plan application for the 10% and 4% AEP storm events (10- and 25-year storms) based on a comparison of existing ground cover at the time of submittal of a stormwater management plan application to post-development site conditions. Confirm the post development volume does not exceed the predevelopment volume for the 10% and 4% AEP storm events.

Site Grading Requirements

Site fill is to be limited to the greatest extent possible to prevent disruption of existing stormwater flow patterns. If fill is required to elevate the site above existing grade the following buffer requirements shall be met:

a. 3:1 slopes 1 foot in height of more above adjoining property shall maintain a min. 5-foot-wide vegetated buffer area for every additional 1 foot of height (e.g. a four embankment would equate to a minimum 15-foot buffer.

b. 4:1 slopes 1 foot in height or more above adjoining property shall maintain a 3-foot-wide vegetated buffer area for every additional 1 foot of height. (e.g. a 4-foot embankment would equate to a minimum 9-foot buffer.)

c. 5:1 slopes 1 foot in height or more above adjoining property shall maintain a 1 foot wide vegetated buffer area for every additional 1 foot of height.

The buffer may overlay other vegetated buffer requirements and may contain stormwater features designed to manage stormwater generated by the fill slope. For grades between listed slopes, the necessary buffer shall be interpolated. Grading shall prevent runoff onto the adjacent property.

Compaction of non-structural fill shall be minimized during construction. Soils in landscaping areas should be protected and amended as needed. Disturbed soils in areas of fill or heavy equipment operation that will be vegetated in the final site stabilization shall be scarified or treated as directed by the designer to improve infiltration and water retention prior to final establishment of vegetation.

Soil Infiltration

Any non-structural fill brought on-site shall be compatible and have adequate permeability to allow water to infiltrate. Soils must have an infiltration rate of a minimum of 0.3 inches per hour as determined by a soil scientist of geotechnical engineer. The permeability test results must be submitted and approved prior to scheduling a certificate of occupancy or certification of construction completion inspection. Soil infiltration best management practices (BMPs) must be consistent with the most current version of the Low Impact Development in Coastal South Carolina: Planning and Design Guide.

Additional Considerations

Compensatory Storage or Floodplain Storage

"The NFIP floodway standard in 44CFR 60.3 (d) restricts new development from obstructing the flow of water and increasing flood heights. However, this provision does not address the need to maintain flood storage. Especially in flat areas, the floodplain provides a valuable function by storing floodwaters. When fill or buildings are placed in the flood fringe, the flood storage areas are lost and flood heights will go up because there is less room for the floodwaters. This is particularly important in smaller watersheds which respond sooner to changes in the topography. One approach that may be used to address this issue is to require compensatory storage to offset any loss of flood storage capacity. Some communities adopt more restrictive standards that regulate the amount of fill or buildings that can displace floodwater in the flood fringe. Community Rating System credits are available for communities that adopt compensatory storage requirements." - FEMA

Floodplain Storage Requirements

Construction activities that reduce storage within the floodplain, commonly known as "fill and build" shall be prevented. The floodplain will be the 1% AEP floodplain as established by Federal Management Agency (FEMA) plus 2.5 feet elevation. The 100 year floodplain is defined by Special Hazard Area Zones A, AE, AH, AO, A99, V and VE. The 2.5 ft will be added to the elevation of the 100 year flood plain. In cases where floodplain storage impacts are proposed, impacts shall be mitigated with a minimum 1:25:1 replacement based on total storage volume to prevent deterioration of basin stormwater storage capacity over time. Mitigation shall be within the same basin effecting the same water surface elevation and hydraulic s as the proposed impact.

Best Management Practices provide for Flexible Design Solutions to address both water quality and quantity. The following are generally accepted permanent quantity BMPs by various jurisdictions. (City of Charleston Design Standards Manual)

Bioretention Areas – Rain Gardens, Stormwater Planters, Tree Boxes – Bioretention areas are shallow stormwater basins or landscaped areas that use engineered soils and vegetation to capture and treat stormwater runoff. Runoff may be returned to the conveyance system through an underdrain or exfiltrated into the soil.

Permeable Pavement Systems – Permeable pavement systems are pavement surfaces that promote infiltration of stormwater through gaps in the pavement to an underlying course of gravel and then to an underdrain or underlying soils resulting in a reduced volume of runoff.

Stormwater Infiltration - Infiltration Trenches and Basins – Infiltration practices are shallow excavations that are filled with stone or engineered soil that allow stormwater runoff to enter and exfiltrate through the adjoining soils or through an underdrain.

Green Roofs – Green roofs are roofs where engineered soil media and vegetation is installed on all or a portion of the surface area. Green roofs reduce the impervious area and the volume of stormwater runoff.

Rainwater Harvesting – Rainwater harvesting is the practice of collecting and beneficially reusing rainwater. Typically, this is limited to rainwater runoff from roofs.

Impervious Surface Disconnection – Runoff from a rooftop, driveway, or other small impervious surface is directed to a pervious surface or practice to provide infiltration, filtering, or reuse. Disconnection practices are intended to reduce the volume of runoff created by impervious surfaces.

Open Channel Systems – Grass Channel and Dry Swale – Vegetated open channels with amended soils or suitable soils for infiltration that are explicitly designed and constructed to capture, route, and infiltrate stormwater runoff.

Site Reforestation – Site reforestation is planting trees on a site. The trees capture rainfall in their leaves and uptake infiltrated water through their roots to reduce stormwater runoff volumes.

Open Channel Systems – Wet Swale and Two Stage Ditches – Stormwater conveyance systems that provide water quality benefits through filtration and pollutant uptake.

Stormwater Filtering Systems: Perimeter Sand Filter – Perimeter sand filters are multi-chamber structures designed to treat stormwater runoff through filtration using a sand bed as its primary filter media. Filtered runoff may be returned to the conveyance system.

Dry Detention Ponds – Dry detention ponds are constructed stormwater basins that are dry between rain events. Runoff from each rain event is detained and treated in the basin, and released at a designed rate.

Wet Detention Ponds – Wet detention ponds are constructed stormwater basins that have a permanent pool, shallow marsh, or micropool of water. Runoff from each rain event is detained and treated in the pool, and released at a designated rate.

Stormwater Wetlands – Stormwater wetlands are natural or constructed systems used for stormwater management. Stormwater wetlands consist of a combination of shallow marsh areas, open water and semi-wet areas above the permanent water surface.

Vegetated Filter Strip – A vegetated buffer, or filter strip, is a uniformly graded and densely vegetated area that treats sheet flow stormwater runoff. The vegetation in the buffer works to slow down the stormwater runoff, settling and filtering some pollutants and uptaking others.

Underground Detention – Underground detention is used as an alternative to surface dry-detention basins. They are used in areas that are space-limited where there is not adequate land to provide the required detention volume. The underground storage uses tanks, vaults, and buried pipes to supply the required storage volume.

Manufactured Treatment Devices: Vortex Separator Baffles Cartridges Skimmers Gravity Oil-Grit Separator Filter Material Inlet Inserts – Pre-fabricated controls use the movement of stormwater runoff through a specially designed practice to remove target pollutants. They are typically used on smaller commercial sites and urban hotspots. There are numerous commercial vendors of these practices, but there is limited data on their performance. Until further research is done and substantial removal efficiencies are published, these structures may require monitoring.

Town of Kiawah Island

Town of Kiawah Island Municipal Center
4475 Betsy Kerrison Parkway
Kiawah Island, SC 29455

July 3, 2024

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Impervious / Pervious Paving

The minimization of total impervious area directly relates to a reduction in stormwater runoff volume and the associated pollutants from a development site. The reduction of the amount of impervious surface has been a direct recommendation of the:

- Comprehensive Marsh Management Plan – 2022
- Flood Mitigation and Sea Level Rise Adaption for Kiawah Island – 2018
- Nature Based Solutions Manual for Kiawah Island – Green Infrastructure
- Low Impact Development in Coastal South Carolina: A Planning and Design Guide

This effort could also count towards Kiawah's Community Rating System (CRS) credits to improve FEMA's score which could lover flood insurance rates.

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Pervious Paving Materials

Pervious Concrete Pavers

- Oceanwoods Driveways & Sandcastle Parking Lot
- Very durable, easy to maintain once installed properly – depends on site conditions
- Costs $14 – $28 SF – same as standard concrete pavers.
- Recommend working with Geotech to verify soil type is appropriate for application.

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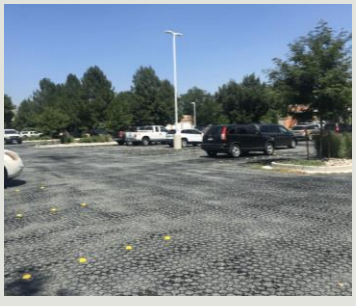
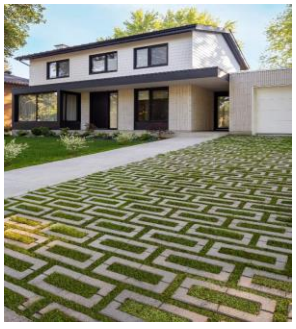
Pervious Paving Systems

- Includes numerous commercial products that have either concrete or plastic cells that are then fillable with pervious material including pea gravel, grass etc. Many systems also allow for on site retention beneath the surface that can tie to a larger stormwater system. This also includes porous precast concrete pavers.
- Flexible applications, works for all soils, min. runoff coefficient
- May require some maintenance depending on materials used for infill.
- Varied costs.





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Pervious Concrete Drives and Walkway

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Pervious Asphalt and Concrete

- Both are familiar materials, made with the same material as the conventional paving but with fines being removed and reduced creating void space, approximately 16% as opposed to 2% for conventional paving.
- The subsurface detail can be modified to adapt to soil conditions.
- Approximate Costs
  - Conventional Asphalt - $ 13-14/SF
  - Pervious Asphalt - $ 15-16/SF
  - Conventional Concrete $7 – 11/ SF
  - Pervious Concrete $ 11.50/ SF

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Soft Materials with Edging

- Pea Gravel, Oyster Shell, Plantation Mix are all options which are used locally.
- Edging is needed to assist in keeping material in place.
- Kiawah River Farmstand Parking Lot – may require paved handicap access if not ADA accessible.
- Costs Vary / Approximate Costs
- Plantation Mix $4.25/SF with steel edging $16/LF
- Pea Gravel $6.75/SF with steel edging $16/ LF

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PROPOSED ZONING TEXT AMENDMENTS

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Proposed Text Amendments

#AZO24-000008 Pervious Paving for Driveways and Parking Lots
- Sec. 12-128. Access, Parking and Loading Regulations.
- Sec 12-63. Description of Zoning District and Regulations.
- Sec. 12-374. Definitions.

#AZO24-000009 Stormwater Management Plan Supplemental Stormwater Design Standards
- Sec. 12-169 – Stormwater Management Plan Review ***(FOR DISCUSSION PURPOSES)***

9

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Zoning Ordinance Text & Map Amendment Applications: Recommendation by the Planning Commission

Section 12-158(3) of the Zoning Ordinance states "The Planning Commission shall review the proposed text amendment and/or zoning map amendment and **take action, recommending that the Town Council approve or deny the proposed amendment**. The Planning Commission may hold a public hearing in accordance with the procedures in section 12-156. **The Planning Commission's recommendation shall be based on the approval criteria of subsection (6) of this section**. The Planning Commission shall submit its recommendation to the Town Council within 30 working days of the Planning Commission meeting at which the amendment was introduced. **A simple majority vote of the Planning Commission members present and voting shall be required to approve the amendment**."

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Zoning Ordinance Text & Map Amendment Applications: Approval Criteria

(6) Approval criteria. Text and zoning map amendments to the ordinance may be approved if the following approval criteria have been met:

a. The proposed amendment is consistent with the purposes and intent of the adopted Town of Kiawah Island Comprehensive Plan;

b. The proposed amendment is consistent with the purposes and intent of this article;

c. The purpose of the proposed amendment is to further the general health, safety and welfare of the Town of Kiawah Island;

d. The proposed amendment corrects an error or inconsistency or meets the challenge of a changed condition.

Staff finds the proposed text amendment consistent with each of the outlined criteria.

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Zoning Ordinance Text and Map Amendment Applications: Decision on Amendment by the Town Council

Section 12-158(5) states "After receiving the recommendation of the Planning Commission, the Town Council shall hold one or more public hearings, **and any time after the close of the public hearing, take action to approve, approve with modifications or deny the proposed amendment based on the approval criteria of subsection (6) of this section. A simple majority vote of Town Council members present and voting shall be required to approve the amendment. Zoning map amendments shall not be approved with conditions. Prior to action on a proposed code text amendment, the Town Council may, in the exercise of its legislative discretion, invoke the "pending ordinance doctrine" by ordinance so that no building permits shall be issued for structures which would be affected by the proposed amendment until the Town Council has rendered its decision on the proposed amendment."**

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SUPPLEMENTAL STORMWATER MANAGEMENT STANDARDS

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Supplemental Stormwater Design Standards Overview

- Comprehensive and phased approach to stormwater management
- Initial recommendations and proposed regulatory changes underway
- Introduction of regulatory changes within stormwater management Best Management Practices
- Education and Awareness Updates
- Planning Commission Discussion

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Supplemental Stormwater Design Standards

- Provide design standards directly affecting stormwater quantity control.
- Applicable to both single family and non-single family sites.
- New construction and redevelopment projects.

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Rainfall & Design Storm Standards

The 24-hour precipitation depths/intensities corresponding to various probabilities for exceedance in any given year.

Frequency	1 year	2 year	5 year	10 year	25 year	50 year	100 year
SCDHEC (inches)	3.80	4.30	5.50	6.60	8.00	9.20	10.40
Charleston County (inches)	3.80	4.60	5.90	7.00	8.00	8.90	10.20
James Island (inches)*	3.80	4.60	6.10	7.20	8.70	9.90	11.30

* Based on 2019 Fifth National Climate Assessment.

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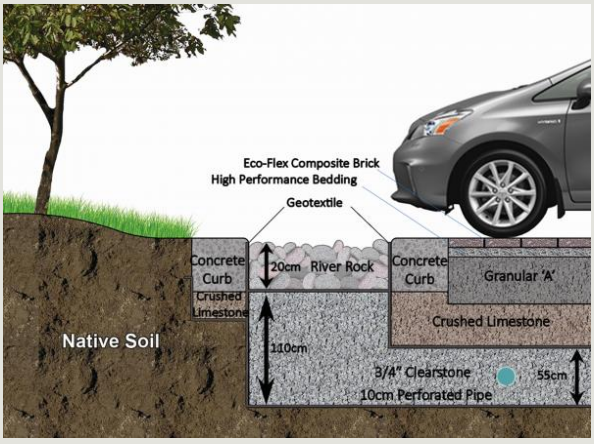
Slow The Flow

To improve stormwater management on sites submitted for review, implement at least one of the following performance standards.

- Reduce Impervious Cover
- Reduce Runoff Volume
- Reduce Peak Discharge Rates
- Combination of Measures



Infiltration Trench

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Runoff Reduction Strategies

- Disconnect downspouts from impervious areas or piped systems
- Install Rain Barrel
- Install Rain Garden
- Install Infiltration Trench
- Remove and replace impervious surfaces with pervious surfaces.

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Site Grading Requirements

Limit site fill to the greatest extent possible to prevent disruption of existing overland stormwater flow patterns.

If fill is required to elevate the site above existing grade require vegetated buffers adjusted to allow transition to adjacent property grade and vegetation.

The buffers may overlay other vegetated buffers and may contain stormwater features designed to manage stormwater generated by the fill slope.

Soil Infiltration

Any non-structural fill brought on site shall have adequate permeability to allow water to infiltrate

Soils must have an infiltration rate of a minimum of 0.3 inches per hour as determined by a soil scientist or geotechnical engineer.

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Stormwater Management Plan Review

STORMWATER MANAGEMENT PLAN CERTIFICATION

A Stormwater Management Plan with Narrative/Plan Notes must be submitted with all Building Permit applications for residential and nonresidential construction projects meeting the following criteria:

- All new construction, exterior remodeling involving a change in the building footprint, parking areas or other impervious surfaces, change of use that results in a more intense use, or additions to any site which cumulatively exceeds 500 square feet in area.
- Adding fill or recontouring of twenty (20) percent or more of the existing lot area for lots which are 12,000 square feet or greater in size.
- Adding fill or recontouring a lot less than 12,000 square feet in size that would impact the stormwater management as determined by the Planning Director.

This plan shall be a separate sheet(s) included with the Building Permit Application submittal and must be prepared by an engineer and/or landscape architect licensed in South Carolina. The plan must comply with SCDHEC and the Town of Kiawah Island Standards.

Owners Name_____ **Building Permit #** _____

Project Address_____**TMS #** _____

Contractor's Name_____

PE/RLA Name _____

Stormwater Plan & Survey

- Signed Stormwater Management Plan Certification form
- A scale site plan corresponding with a current survey, illustrating contour/topography lines, property boundaries, scale and property ownership information (address (TMS# etc.)
- Lot elevation at property corners, building pad and lot elevations 10' within adjacent properties (this must be determined when adding fill to the property line)
- Spot elevations of low areas.
- DHEC-OCRM Critical Line and/or Baseline and Setback line
- Easements (include recording numbers if applicable).
- Existing and proposed structures including setbacks
- Location of all trees, including those to be removed and tree protection.
- Location of exiting and proposed drainage facilities such as roof downspouts, pipes, catch basins, grates, splash blocks, dispersion trenches, infiltration trenches, etc.
- Existing and proposed structures (including bulkheads, retaining walls etc.)
- Proposed drainage flow patterns for surface runoff
- Construction details for proposed stormwater drainage facilities and BMP's
- Location of adjacent public stormwater drainage facilities such as ditches, catch basins.
- Location of water and sanitary sewer service.
- Proposed temporary erosion and sediment control measures such as silt fencing, construction entrances, interceptor swales etc.

Stormwater Management Narrative/Report

- Summary of existing and new impervious areas
- Summary of drainage design for surface runoff where no area drains and pipe collection systems are proposed.
- Summary of proposed Best Management Practices (BMP's) and confirmation of regular inspection and maintenance schedule of onsite BMP's.

***** An as built survey may be required for any new construction and substantial improvement.**

Note the following statement on the Stormwater Plan:

"I, _____ (print name here) am a professional engineer or registered landscape architect in the State of South Carolina. The attached plans for _____ (street address) are in accordance with Zoning Ordinance 12-169 Stormwater Management Plan and I certify the means and methods proposed in this plan will prevent any adverse impacts to adjacent or downstream properties as a result of the permitted development.

Under my credentials as a licensed professional engineer or registered landscape architect in South Carolina, I hereby certify that the stormwater control measures, BMP's and the final grading for this project, will be completed and maintained in accordance with the plans and specifications detailed. I further certify that a post-development as-built survey may be required to confirm compliance with the approved stormwater management plan prior to receiving a **Certificate of Completion** or prior to the issuance of a **Certificate of Occupancy**.

Property Owner's Signature_____ Date: _____

Professional Engineer/RLA Signature :_____Date:_____

Professional Engineer/ RLA Signature (required after construction):_____

Completion Date:_____ Staff Signature:_____

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Town of Kiawah Island Zoning Ordinance Amendment Request
Case AZO24-000007

Planning Commission Meeting: June 5, 2024
Public Hearing and First Reading: July 2, 2024
Second Reading:

CASE INFORMATION

Applicant: Town of Kiawah Island

Application: The Town of Kiawah is requesting to amend the *Town of Kiawah Island Land Use Planning and Zoning Ordinance Article II. Zoning, Division 5. General Procedural Requirement*s, establishing Sec. 12-169. Stormwater Management Plan Review.

Key Factors of the Proposed Ordinance:

The purpose of the proposed zoning amendment is to enhance stormwater management best management practices for purposes of reducing flooding, protecting water quality, controlling erosion, fill and managing runoff. This proposed ordinance provides the Town with greater ability to review and administer stormwater standards and best management practices for low impact development and green infrastructure.

The proposed ordinance would be applicable to all development types including single family residential, non-single family residential and commercial development projects and would require a stormwater management plan for review and approval.

> No lot shall be built upon, graded, or filled without the Planning Director or Building Official's prior approval of a stormwater management plan. The stormwater management plan and construction specifications must be stamped and signed by a registered engineer or landscape architect actively licensed in the state of South Carolina. All stormwater plans must include a scaled site plan and survey illustrating all existing and proposed topographical features of the lot, existing and proposed drainage flow patterns, with a site narrative describing the means and methods of preventing adverse impacts to adjacent and or downstream properties. The following site changes shall require the submittal of a stormwater management plan:
>
> a. Any new building construction, new impervious source or replacement of impervious surfaces, which cumulatively exceed 500 square feet in area.
>
> b. Adding fill or recontouring of twenty (20) percent or more of the existing lot area.

RECOMMENDATION BY THE PLANNING COMMISSION

Pursuant to §12-158(3) of the *Land Use Planning and Zoning Ordinance* "The Planning Commission shall review the proposed text amendment and/or zoning map amendment and take action, recommending that the Town Council approve or deny the proposed amendment. The Planning Commission may hold a public hearing in accordance with the procedures in section 12-156. The Planning Commission's recommendation shall be based on the approval criteria of subsection (6) of this section. The Planning Commission shall submit its recommendation to the Town Council within 30 working days of the Planning Commission meeting at which the amendment was introduced. A simple majority vote of Planning Commission members present, and voting shall be required to approve the amendment."

DECISION ON AMENDMENT BY THE TOWN COUNCIL

Pursuant to §12-158(5) of the *Land Use Planning and Zoning Ordinance* "After receiving the recommendation of the Planning Commission, the Town Council shall hold one or more public hearings,

and any time after the close of the public hearing, take action to approve, approve with modifications, or deny the proposed amendment based on the approval criteria of subsection (6) of this section. A simple majority vote of Town Council members present, and voting shall be required to approve the amendment. Zoning map amendments shall not be approved with conditions. Prior to action on a proposed code text amendment, the Town Council may, in the exercise of its legislative discretion, invoke the "pending ordinance doctrine" by ordinance so that no building permits shall be issued for structures which would be affected by the proposed amendment until the Town Council has rendered its decision on the proposed amendment.

APPROVAL CRITERIA

Pursuant to §12-158(6) of the *Land Use Planning and Zoning Ordinance*, (6) Approval criteria. Text and zoning map amendments to the ordinance may be approved if the following approval criteria have been met:

a. The proposed amendment is consistent with the purposes and intent of the adopted Town of Kiawah Island Comprehensive Plan;

b. The proposed amendment is consistent with the purposes and intent of this article;

c. The purpose of the proposed amendment is to further the general health, safety and welfare of the Town of Kiawah Island;

d. The proposed amendment corrects an error or inconsistency or meets the challenge of a changed condition.

PLANNING COMMISSION MEETING – JUNE 5, 2024

Notifications: Notice of this meeting has been published and posted in accordance with the Freedom of Information Act and the requirements of the Town of Kiawah Island.

On June 5, 2024, the Planning Commission Recommended approval of the proposed ordinance amendment by a vote of 6 to 1.

The Planning Commission highlighted the need to incorporate a qualifying factor for smaller lots. Planning staff incorporated a distinction between lots greater than 12,000 square feet and those less than 12,000 sqft in size, granting administrative discretion for lots less than 12,000 square feet in size.

PLANNING STAFF REVIEW & COMMENTS

Planning staff finds the proposed amendment satisfies the approval criteria pursuant to §12-158(6) and recommends approval.

The proposed text amendment is consistent with the Town's Comprehensive Plan as this amendment derives as a recommendation from the Comprehensive Marsh Management Plan, and the Flood Mitigation and Sea Level Rise Adaptation Report.

Recommendation: Strictly limit impermeable surfaces, formalize stormwater BMPs for private properties. "Justification: Current stormwater regulations simply direct designers to convey water to the critical line or other outfall point, without consideration of its potential effects on the marsh. Low Impact Development (LID) is an integrated, comprehensive approach to land development or redevelopment that works with nature to manage stormwater as close to its source as possible. LID practices can protect local water quality and reduce urban flooding through best practices in stormwater management. Widespread implementation will also reduce pollution of the marsh by filtering and nutrient retention." – 2023 CMMP

The proposed text amendment adopts language to allow enforcement of current DHEC standards and

greater Town of Kiawah Island standards for all developments as it pertains to stormwater and best management practices. As a subsequent step administratively, a Stormwater Management Plan Application is developed as part of the permitting process which outlines more detailed requirements for the applicant to submit for review. These may include but not limited to:

- A scaled site plan corresponding with a current survey, illustrating contour/topography lines, property boundaries, scale, and property ownership information (address, TMS#, etc.)
- Narrative describing means and methods of preventing adverse impacts to adjacent, downstream, and/or surrounding properties.
- Lot elevation at property corners, building pad, and lot elevations 10' within adjacent properties (this must be determined when adding fill to the property line)
- Spot elevations of low points
- DHEC-OCRM Critical Line and/or Baseline and Setback line
- Easements (include recording numbers if applicable)
- Existing and proposed structures including setbacks
- Location of trees to be removed and saved
- Location of existing and proposed stormwater drainage facilities such as roof downspouts, pipes, catch basins, grates, splash blocks, dispersion trenches, dispersion buffers, vegetated flow paths, infiltration trenches, etc.
- Existing and proposed structures (including bulkheads, retaining walls, etc.)
- Existing and proposed impervious surfaces such as driveways, patios, buildings, parking areas, sport courts etc.
- Proposed drainage flow patterns for surface runoff
- Construction details for proposed stormwater drainage facilities
- Location of adjacent public stormwater drainage facilities such as ditches and catch basins
- Location of water and sanitary sewer service
- Proposed temporary erosion and sediment control measures such as silt fencing, construction entrances, interceptor swales, concrete washouts etc. (Shown on plan)

In administering the standards for substantial developments, staff recommends a consulting engineer be hired to review stormwater management plans for larger projects and require applicants to submit inspection reports as recommended. Additionally provide advance training for TOKI staff to review and inspect single family projects. A water quality fee (stormwater) may be used to assist recommended offset of review costs.

Planning staff has outlined a comprehensive approach to regulatory changes for stormwater management for the Town of Kiawah Island which are being phased with the Planning Commission with inputs from the CMMP workgroup and the Environmental Committee. The proposed text amendment is one step of a phased approached to comprehensive regulatory changes. These include:

- Implementation of low impact development and green infrastructure best management practices.
- Adoption of greater stormwater management standards for Kiawah (engineered metrics)
- Modified onsite retention requirements and modified buffer standards for marsh and ponds
- Permeable requirements for driveways, parking and non-primary trails.
- Comprehensive review of lot coverage standards.

Continued efforts to educate and inform the community on best management practices will continue through collaboration with the CMMP and the Town's Communications Department.

TOWN COUNCIL MEETING PUBLIC HEARING – JULY 2, 2024

Notifications: Notice of this meeting has been published and posted in accordance with the Freedom of Information Act and the requirements of the Town of Kiawah Island.

Town of Kiawah Island

Town of Kiawah Island Municipal Center
4475 Betsy Kerrison Parkway
Kiawah Island, SC 29455

July 2, 2024

1

1

COMPREHENSIVE STORMWATER MANAGEMENT STRATEGIES AND PROPOSED REGULATORY CHANGES

2

2

Comprehensive Marsh Management Plan

- **Recommendation: Strictly limit impermeable surfaces, formalize stormwater BMPs for private properties.**
  - Justification: Current stormwater regulations simply direct designers to convey water to the critical line or other outfall point, without consideration of its potential effects on the marsh. Low Impact Development (LID) is an integrated, comprehensive approach to land development or redevelopment that works with nature to manage stormwater as close to its source as possible. LID practices can protect local water quality and reduce urban flooding through best practices in stormwater management. Widespread implementation will also reduce pollution of the marsh by filtering and nutrient retention.

3

3

Opportunities and Pathways

Incentives

- Driveway Replacement Program
- Rain Barrel & Rain Garden Programs
- Financial
  Grants, Expedited Permitting, Waived Fees
- Special Recognition

Permeable Requirements

- Driveways
- Parking
- Non-Primary Trails

Stormwater Regulations

- LID and Green Infrastructure Requirements based on BMPs
- "Water Quality Fee"
  Stormwater Fees
- Modified onsite retention requirements prior to entering the master drainage system
- Modified buffer standards for marsh and ponds

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A Comprehensive Approach to Kiawah's Stormwater Regulatory Changes

- **Implementation of Low Impact Development and Green Infrastructure BMPs**
- **Greater Stormwater Management Standards for Kiawah**
  - Requirements of onsite management before entering master drainage system
- **Coordination and Input from Professional Engineers**
  - **Staff has coordinated with various entities to receive general input and or recommendations from professional engineers for the proposed regulatory changes for Kiawah Island.**
    - Kiawah Island Community Association
    - Charleston County Public Works Department (Stormwater)
    - Weston & Sampson Town of James Island
    - Town of Sullivans Island

5

5

Stormwater

What is it and what do we do to control it?

6

6

What is stormwater?

Stormwater is water that originates from precipitation events, snowmelt, or runoff

Stormwater is urban and agricultural – rain falls everywhere!

7

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How is stormwater managed?

- **Control flooding** by installing, cleaning, and maintaining stormwater infrastructure such as curbs and gutters, street inlets, pipes, ditches, culverts, detention ponds, etc.
- **Regulate development** by setting design standards, providing technical guidance, reviewing plans for development and redevelopment, inspecting construction sites, and enforcing regulations.
- **Prevent pollution** by educating the public, implementing clean water programs, inspecting and monitoring runoff, complying with federal and state regulations, and enforcing water quality standards set by the Clean Water Act.

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Stormwater Management Plan Components

- Water Quantity Controls
- Water Quality Controls
- Erosion and Sedimentation Controls
- Stormwater Conveyance Controls
- Maintenance Scheduled for Construction and Post Construction.

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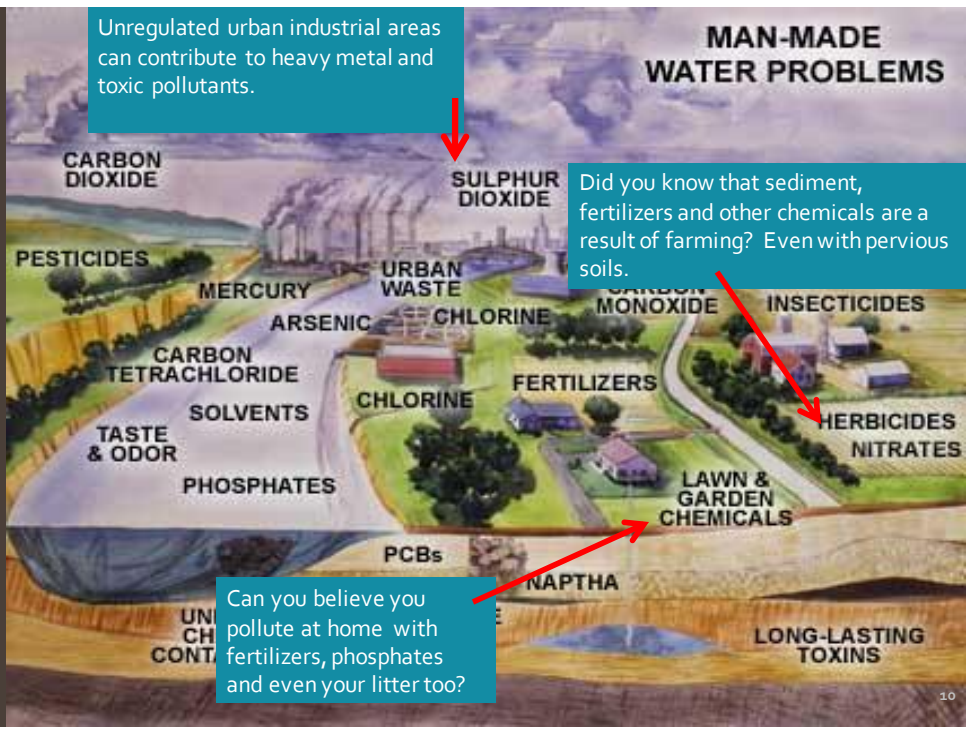
Controlling Runoff = Controlling Stormwater

The three types of runoff that contribute to controlling stormwater quality are:

- Rural Runoff.
- Urban Runoff
- Suburban Runoff



10

Currently only approx. 2.5% of construction projects on Kiawah Island are regulated for stormwater management.

South Carolina Department of Health and Environmental Control (SCDHEC) requires projects larger than 1 acre to get a NPDES (National Pollutant Discharge Elimination System) Construction General Permit.

Most of our local coastal communities have created their own utility and become a MS4 (Municipal Separate Storm Sewer System) that own the stormwater infrastructure. Several partner with Charleston County for administrative and regulatory support. The Town of Kiawah would not qualify for that partnership as KICA, a private entity, owns and operates the master drainage system for the island. The State of South Carolina has over 70 regulated small MS4s.

Many of the coastal MS4s have adopted additional requirements above the DHEC and Charleston County Stormwater Program.

Mt. Pleasant – specific ordinance for Single Family Stormwater Management
Town of James Island – supplemental Stormwater Design Standards for both single family residences and non single family sites.

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Best Management Practices require concrete washouts, a simple detail that allows leftover concrete to be removed from a construction site.

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Recommendations

1. Adopt language to allow enforcement of current DHEC standards for all construction sites on the island. (Town of Sullivans Island)
2. Develop a Stormwater Management Plan Application
3. Hire a consulting engineer to review stormwater management plans for larger projects and require applicants to submit inspection reports as recommended.
4. Provide for advance training for TOKI staff to review and inspect single family projects.

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PROPOSED ZONING TEXT AMENDMENT

AZO24-000007

Stormwater Management Plan

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Proposed Text Amendment

#AZO24-000007 Stormwater Management Plan

Objective: To require a stormwater management plan for development projects

Division 5. General Procedural Requirements; Section 12-169 Stormwater Management Plan

No lot shall be built upon, graded or filled without the Planning Director or Building Official's prior approval of a stormwater management plan. The stormwater management plan and construction specifications must be stamped and signed by a registered engineer or landscape architect actively licensed in the state of South Carolina. All stormwater plans must include a scaled site plan and survey illustrating all existing and proposed topographical features of the lot, existing and proposed drainage flow patterns, with a site narrative describing the means and methods of preventing adverse impacts to adjacent and or downstream properties. The following site changes shall require the submittal of a stormwater management plan:

a. Any new building construction, new impervious source or replacement of impervious surfaces, which cumulatively exceed 500 square feet in area.

b. Adding fill or recontouring of twenty (20) percent or more of the existing lot area (qualified by lot size)

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Zoning Ordinance Text & Map Amendment Applications: Recommendation by the Planning Commission

Section 12-158(3) of the Zoning Ordinance states "The Planning Commission shall review the proposed text amendment and/or zoning map amendment and **take action, recommending that the Town Council approve or deny the proposed amendment**. The Planning Commission may hold a public hearing in accordance with the procedures in section 12-156. **The Planning Commission's recommendation shall be based on the approval criteria of subsection (6) of this section**. The Planning Commission shall submit its recommendation to the Town Council within 30 working days of the Planning Commission meeting at which the amendment was introduced. **A simple majority vote of the Planning Commission members present and voting shall be required to approve the amendment**."

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Zoning Ordinance Text & Map Amendment Applications: Approval Criteria

(6) Approval criteria. Text and zoning map amendments to the ordinance may be approved if the following approval criteria have been met:

a. *The proposed amendment is consistent with the purposes and intent of the adopted Town of Kiawah Island Comprehensive Plan;*

b. *The proposed amendment is consistent with the purposes and intent of this article;*

c. *The purpose of the proposed amendment is to further the general health, safety and welfare of the Town of Kiawah Island;*

d. *The proposed amendment corrects an error or inconsistency or meets the challenge of a changed condition.*

Staff finds the proposed text amendment consistent with each of the outlined criteria.

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Town of Kiawah Island
Zoning Text Amendment Application(s)

Case# AZO24-000007

Planning Commission Meeting: June 5, 2024

Planning Commission Recommended Approval by a vote of 6-1

Town Council Public Hearing and First Reading: July 2, 2024

Second Reading: TBD

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Zoning Ordinance Text and Map Amendment Applications: Decision on Amendment by the Town Council

Section 12-158(5) states "After receiving the recommendation of the Planning Commission, the Town Council shall hold one or more public hearings, **and any time after the close of the public hearing, take action to approve, approve with modifications or deny the proposed amendment based on the approval criteria of subsection (6) of this section. A simple majority vote of Town Council members present and voting shall be required to approve the amendment. Zoning map amendments shall not be approved with conditions. Prior to action on a proposed code text amendment, the Town Council may, in the exercise of its legislative discretion, invoke the "pending ordinance doctrine" by ordinance so that no building permits shall be issued for structures which would be affected by the proposed amendment until the Town Council has rendered its decision on the proposed amendment."**

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TOWN OF KIAWAH ISLAND

ORDINANCE 2024-20

An Ordinance to Amend Chapter 12 – Land Use Planning and Zoning Ordinance Article II. Zoning, Division 5. General Procedural Requirements, establishing Sec. 12-169. Stormwater Management Plan Review to enhance stormwater management best management practices for purposes of reducing flooding, protecting water quality, controlling erosion, fill and managing runoff.

WHEREAS, the Town of Kiawah Island Municipal Code currently contains *Chapter 12 - Land Use Planning and Zoning*; and

WHEREAS, the Town of Kiawah Island now finds that, upon further review, it is in the public interest to amend the *Town of Kiawah Island Land Use Planning and Zoning Ordinance* to implement standards relative to stormwater management; and

WHEREAS, the text amendment would be consistent with the purposes and intent of the adopted Comprehensive Plan and would not be detrimental to the public health, safety, and welfare of the Town of Kiawah Island; and

WHEREAS, the text amendment would be consistent with the recommendations of the *Town of Kiawah Island's Comprehensive Marsh Management Plan* and the *Town of Kiawah Island's Flood Mitigation and Sea Level Rise Adaptation Report* for purposes of addressing stormwater runoff concerns for both water quantity and water quality; and

WHEREAS, the Planning Commission held a meeting on June 5, 2024 at which time a presentation was made by staff, and an opportunity was given for the public to comment on the text amendment request; and

WHEREAS, the Planning Commission, after consideration of the staff report, subsequently voted to recommend to Town Council that the proposed amendment be approved; and

WHEREAS, Town Council held a Public Hearing on July 2, 2024 providing the public an opportunity to comment on the proposed amendment.

NOW, THEREFORE, BE IT ORDERED AND ORDAINED BY THE COUNCIL OF THE TOWN OF KIAWAH ISLAND, SOUTH CAROLINA, AND IT IS ORDAINED BY THE AUTHORITY OF SAID COUNCIL.

Section 1 **Purpose**

The purpose of this Ordinance is to amend Chapter 12 - Land Use Planning and Zoning Ordinance to provide for review and use of best management practices for stormwater management and construction practices for the purposes of reducing flooding, protecting local water quality, managing storage and treatment of stormwater runoff, reducing pollution of the marsh, reducing erosion, and managing fill as a result of construction activities.

Section 2 **Ordinance**

(1) The Town hereby establishes Section 12-169. Stormwater Management Plan Review as shown in the attached **"Exhibit A,"** which is hereby incorporated herein by reference.

Section 3 **Severability**

If any part of this Ordinance is held to be unconstitutional, it shall be construed to have been the legislative intent to pass said Ordinance without such unconstitutional provision, and the remainder of said Ordinance shall be deemed to be valid as if such portion had not been included. If said Ordinance, or any provisions thereof, is held to be inapplicable to any person, group of persons, property, kind property, circumstances or set of circumstances, such holding shall not affect the circumstances or set of circumstances, such holding shall not affect the applicability thereof to any other persons, property, or circumstances.

Section 4 **Effective Date and Duration**

This Ordinance shall be effective upon its enactment by Town Council for the Town of Kiawah Island.

PASSED, APPROVED, AND ADOPTED BY THE COUNCIL FOR THE TOWN OF KIAWAH ISLAND ON THIS ___ DAY OF ____, 2024.

Bradley D. Belt, Mayor

ATTEST:

By: _____
Petra Reynolds, Town Clerk

1st Reading: July 2, 2024

2nd Reading:

Sec. 12-169. Stormwater Management Plan Review.

The purpose of this section is to provide for review and use of best management practices for stormwater management and construction practices for the purposes of reducing flooding, protecting local water quality, managing storage and treatment of stormwater runoff, reducing pollution of the marsh, reducing erosion, and managing fill as a result of construction activities.

1. *Applicability.*
    a. *Generally.* A stormwater management plan is required to be submitted to the Town for review in accordance with the provisions contained within this section for the following site changes:
        i. All new construction, exterior remodeling involving a change in the building footprint, parking areas or other impervious surfaces, change of use that results in a more intense use, or additions to any site which cumulatively exceeds 500 square feet in area.
        ii. Adding fill or recontouring of twenty (20) percent or more of the existing lot area for lots which are 12,000 square feet or greater in size.
        iii. Adding fill or recontouring a lot less than 12,000 square feet in size that would impact the stormwater management as determined by the Planning Director.
2. *Application*. No zoning or building permit shall be issued for a development project until a stormwater management plan has been reviewed and approved in accordance with the provisions contained within this section.
3. *Procedures for issuance of stormwater management plan approval.*
    a. Stormwater management plans shall be reviewed and are subject to the approval of the Planning Director or Building Official. For development projects requiring site plan review approval, pursuant to Sec. 12-162 Site Plan Review, the Planning Director may consult with an external engineer to provide review of submitted stormwater management plans.
    b. A stormwater management plan may be approved, approved with conditions, or denied.
4. *Submittal Requirements.* The property owner or designated representative shall initiate stormwater management review by filing an application with the Planning Director. The contents of the application shall be included on a form developed by the Town, as may be amended from time to time.
    a. The stormwater management plan and construction specifications must be stamped and signed by a registered engineer or landscape architect actively licensed in the State of South Carolina.
    b. All stormwater plans must include:
        i. A scaled site plan and survey illustrating all existing and proposed topographical features of all respective lot or lots;
        ii. Existing and proposed drainage flow patterns;
        iii. A site narrative describing the means and methods of preventing adverse impacts to adjacent, downstream, and/or surrounding properties; and
        iv. Such other reasonable and pertinent information, materials, design specifications and maintenance schedules with regard to the stormwater, the subject property, or neighboring lots as the Planning Director may find necessary to carry out the purposes and intent of this section and to ensure compliance with South Carolina Department of Health and Environmental Control (DHEC) and the Town of Kiawah Island standards.

c. Inspection reports shall be submitted for review for development projects greater than 20,000 square feet in size or as recommended by the Planning Director or its designee.

EXAMPLE STORMWATER APPLICATION

STORMWATER MANAGEMENT PLAN CERTIFICATION

A Stormwater Management Plan with Narrative/Plan Notes must be submitted with all Building Permit applications for residential and nonresidential construction projects meeting the following criteria:

- All new construction, exterior remodeling involving a change in the building footprint, parking areas or other impervious surfaces, change of use that results in a more intense use, or additions to any site which cumulatively exceeds 500 square feet in area.

- Adding fill or recontouring of twenty (20) percent or more of the existing lot area for lots which are 12,000 square feet or greater in size.

- Adding fill or recontouring a lot less than 12,000 square feet in size that would impact the stormwater management as determined by the Planning Director.

This plan shall be a separate sheet(s) included with the Building Permit Application submittal and must be prepared by an engineer and/or landscape architect licensed in South Carolina. The plan must comply with SCDHEC and the Town of Kiawah Island Standards.

Owners Name_____ **Building Permit #** _____

Project Address_____**TMS #** _____

Contractor's Name_____

PE/RLA Name _____

Stormwater Plan & Survey

- Signed Stormwater Management Plan Certification form
- A scale site plan corresponding with a current survey, illustrating contour/topography lines, property boundaries, scale and property ownership information (address (TMS# etc.)
- Lot elevation at property corners, building pad and lot elevations 10' within adjacent properties (this must be determined when adding fill to the property line)
- Spot elevations of low areas.
- DHEC-OCRM Critical Line and/or Baseline and Setback line
- Easements (include recording numbers if applicable).
- Existing and proposed structures including setbacks
- Location of all trees, including those to be removed and tree protection.
- Location of exiting and proposed drainage facilities such as roof downspouts, pipes, catch basins, grates, splash blocks, dispersion trenches, infiltration trenches, etc.
- Existing and proposed structures (including bulkheads, retaining walls etc.)
- Proposed drainage flow patterns for surface runoff
- Construction details for proposed stormwater drainage facilities and BMP's
- Location of adjacent public stormwater drainage facilities such as ditches, catch basins.
- Location of water and sanitary sewer service.
- Proposed temporary erosion and sediment control measures such as silt fencing, construction entrances, interceptor swales etc.

Stormwater Management Narrative/Report

- Summary of existing and new impervious areas
- Summary of drainage design for surface runoff where no area drains and pipe collection systems are proposed.
- Summary of proposed Best Management Practices (BMP's) and confirmation of regular inspection and maintenance schedule of onsite BMP's.

***** An as built survey may be required for any new construction and substantial improvement.**

Note the following statement on the Stormwater Plan:

"I, _____ (print name here) am a professional engineer or registered landscape architect in the State of South Carolina. The attached plans for _____ (street address) are in accordance with Zoning Ordinance 12-169 Stormwater Management Plan and I certify the means and methods proposed in this plan will prevent any adverse impacts to adjacent or downstream properties as a result of the permitted development.

Under my credentials as a licensed professional engineer or registered landscape architect in South Carolina, I hereby certify that the stormwater control measures, BMP's and the final grading for this project, will be completed and maintained in accordance with the plans and specifications detailed. I further certify that a post-development as-built survey may be required to confirm compliance with the approved stormwater management plan prior to receiving a **Certificate of Completion** or prior to the issuance of a **Certificate of Occupancy**.

Property Owner's Signature_____ Date: _____

Professional Engineer/RLA Signature :_____Date:_____

Professional Engineer/ RLA Signature (required after construction):_____

Completion Date:_____ Staff Signature:_____