Residential Structures

A. Significance: Over the past three years Kiawah Island residential property owners have witnessed several flooding events, and some have experienced direct damage to their homes. In the coming decades we can anticipate more frequent and occasionally more severe flooding due to extreme precipitation events, nuisance tidal flooding, storm surge, or combinations of these situations. It is important for property owners to be able to protect themselves and their residences as much as possible from these events.

B. Current Status: The Federal Emergency Management Agency (FEMA) develops maps that identify areas prone to flooding and delineates them into zones based on flood risk and source. These zones provide the basis for establishment of flood insurance rates through the National Flood Insurance program (NFIP). Almost all residential properties on Kiawah lie within Zone AE (High Risk Area with Base Flood Elevations determined), with portions of some properties extending into Zone VE (High Risk and wave action hazard with Base Flood Elevations determined). Specific Base Flood Elevations (BFEs) are provided for each subdivision within these categories based on land topography and may vary by several feet across the island. Newly proposed FEMA flood maps for Kiawah are available at http://chascogis.maps.arcgis.com/apps/View/index.html?appid=33df503a50284fcf8c4564930741a1b1. More detailed, up-to-date and Kiawah specific maps are available at (Levine info goes here when available).

All new residential construction must be built so that the first floor living space and all equipment supporting the residence (e.g. HVAC systems) is above the BFE for that location or is floodproofed to that elevation. In addition, the Town of Kiawah Island currently requires all new construction to be built at an additional one-foot elevation (termed "freeboard") above the BFE. All newer homes are built to these standards. They often have an open area or non-living space such as a garage under the house. Older homes built prior to the FEMA standards may only be elevated a few feet above grade, placing the living space below the BFE. Thus, dwellings on Kiawah fall into two main categories in regard to flood hazard:

1. Residences with the first floor living space above the BFE for that location, including
   - Single family homes generally behind the second gate or recently built
   - Free standing cottage regimes built on pilings, e.g. Inlet Cove, Sparrow Pond, Night Heron
2. Residences with the first floor living space below the BFE for that location, including
   - Single family homes primarily in the West Beach area
   - Multifamily villa regimes, e.g. Parkside, Fairway Oaks, Turtle Cove, Tennis Club

C. Concerns: There is potential for significant flood damage to residences in both categories. Actually, during the recent storms, homeowners in the elevated homes category may have experienced more damage than those in the second category. This was largely due to what was stored in the ground level area and how it had been enclosed. Flooding that encroaches on residences may result from very heavy precipitation or from salt water brought in by very high tides and by storm surges. Both types of events are projected to increase in the coming decades, and of course can occur simultaneously. Precipitation-induced flooding usually results because the water cannot be moved away from residences and roads quickly enough and into the stormwater drainage system. Saltwater intrusion, on the other hand, cannot be removed simply by improved drainage, but must either be prevented, or structures must be adapted to accommodate it.

D. Recommendations: In suggesting recommendations we recognize several different situations:

Precipitation-induced Flooding

1. Make sure that the ground around your residence slopes away from the house to prevent water from flowing under the dwelling.
2. Install downspouts connected to drain tile to carry water from the roof away from the foundation of the house.
3. Do not dump anything into storm drains, swales (roadside depressions designed to manage water runoff by directing it into drains, filter pollutants, and increase rainwater infiltration), ditches, streams, or lagoons. A single plastic bag, grass clippings, or shrubbery trimmings can clog the system and cause a chain reaction backup, resulting in flooding over a large area. Ensure that your landscape contractors also abide by this regulation (Town Municipal Code, Section 15-213). If you see unauthorized dumping anywhere near ditches, streams, or lagoons, contact Town Hall (843) 768-9166.
4. If your property is adjacent to a storm drain, swale, ditch, stream, or lagoon, please proactively keep the banks clear of debris. Join with your neighbors to “adopt a drain”.
5. Consider the installation of a rain garden or other low impact development landforms to better manage precipitation. A rain garden is a depressed area in the landscape that collects rain water from a roof, driveway or street and allows it to soak into the ground. Planted with grasses and flowering perennials, rain gardens can be a cost effective and attractive way to reduce runoff from your property. Rain gardens can also help filter out pollutants in runoff and provide food and shelter for butterflies, song birds and other wildlife.
6. Allow more precipitation to infiltrate the soil by reducing impermeable surfaces on your property through installation of permeable surface driveways and walkways.

7. Do not block a roadside swale by building up a driveway over it. This can block the flow of water for which it was designed and cause localized flooding.
8. With any modifications of your property, avoid adversely affecting neighboring properties, roads, ponds and marsh.
9. Become better educated about managing precipitation runoff through Low Impact Development: http://www.scseagrant.org/pdf_files/LID-in-Coastal-SC-low-res.pdf.
10. Always remember to check with Town Hall, KICA, and the Architectural Review Board before you build on, alter, remodel, re-grade or fill on your property. Permits are required to ensure that you are in compliance with all applicable ordinances and regulations. If you have any questions regarding permits, please call the Town's Building Services department at (843) 768-9166. If you see building or land alterations at a site without a permit sign posted, report it to the Town (843) 768-9166.

Residences Currently At or Above Base Flood Elevation plus Freeboard

1. Wet floodproof your home by ensuring that flood water vents are of sufficient size and fully open to allow water to flow beneath the structure as designed. Ensure that break-away walls will function as designed. Consider a new type of flood vent that automatically opens and closes with rising and dropping water levels.
2. Consider installing a car ramp or lift in your garage that will elevate your vehicle a few extra feet in the advent of a flood.
3. Move contents, electrical wiring, and ductwork to higher floors if they are susceptible to damage by flood waters. Installation of an elevated racking system could be helpful.
4. Dry floodproof the area under the house with water-tight bolt-on panels. These may be expensive, aesthetically questionable, and must be installed and removed with changing conditions. Waterproof exterior walls and add watertight seals to doors.
5. Walls and other structures built under base flood elevation should be constructed of cement block, concrete, or other water-resistant material, never of sheetrock or other material susceptible to water damage. A good alternative to sheetrock is PVC sheet (such as *Azek*).
6. Insure any yard or concrete pavement drains are free and unobstructed.

Residences Currently Below Base Flood Elevation

1. Consider raising your home to base flood elevation plus local freeboard height. While expensive, it may not be as cost-prohibitive as one might expect. There are current ARB height elevation restrictions that need to be considered. But with anticipated ARB recognition of sea level rise, future accommodations are expected. Roof profiles can be altered in aesthetically pleasing ways if necessary, e.g. “crickets” between parallel rooflines to reduce overall height of rooflines.
2. Ensure that flood water vents are of sufficient size to allow water to flow beneath the structure as designed.
3. Move contents, electrical wiring, and ductwork to higher floors if they are susceptible to damage by flood waters.
4. Consider dry floodproofing the house by waterproofing exterior walls and the underside of the house and adding watertight seals to doors and windows. This option may be more expensive than raising the house.
5. Insure any yard or concrete pavement drains are free and unobstructed.

General Recommendations

1. Charleston currently has a two-foot freeboard requirement. The Town should consider increasing its freeboard requirement. Alternatively, the Town might require all new structures be built to a single elevation standard that exceeds all the BFEs found on the island on the new proposed FEMA maps.
2. The ARB should proactively work with homeowners, the Town, and other entities to help them identify and implement actions that will permit Kiawah property owners to adapt to changing weather and water conditions.
3. KICA should insure that ponds and street drainage are optimally employed to eliminate or minimize the duration of pooling of water on streets and particularly at intersections key to vehicular traffic. Some street elevations and terrain drainage will need to be modified. Pond outfalls need automated check valves to minimize sea water ingress.
4. Everyone should insure their neighborhood street and any yard drains are functioning as designed.
5. Organize with your neighbors and local officials to explore the construction of earthen berms to protect a neighborhood from tidal flooding, and cost-share the expense.
6. Obtain a copy of FEMA P-312, Homeowner's Guide to Retrofitting 3rd Edition (2014) at https://www.fema.gov/media-library/assets/documents/480#

E. Responsibilities and Partners:

- The Town of Kiawah Island (TOKI) is responsible for establishing and enforcing building codes and ordinances prohibiting dumping of trash or other materials into the stormwater management system.
- The Architectural Review Board (ARB) is responsible for approving all exterior building modifications and landscaping.
- The Kiawah Island Community Association (KICA) is responsible for maintenance and modification to the stormwater management system.

F. Additional Information:

The committee was assisted in preparing this section by three local architects who work extensively on Kiawah:
Charles Hudson of Hudson Designs, Inc.
Mark Permar of Permar, Inc.
Tyler Smyth – Tyler Smyth Architects, LLC

FEMA's Homeowner's Guide to Retrofitting 3rd Edition (2014) at
https://www.fema.gov/media-library/assets/documents/480#

FEMA's Flood Damage-Resistant Materials Requirements at
https://www.fema.gov/media-library-data/20130726-1502-20490-4764/fema_tb_2_rev1.pdf

All FEMA Technical Bulletins at https://www.fema.gov/media-library/collections/4

Low Impact Development for Coastal South Carolina (2014) at
http://www.scseagrant.org/pdf_files/LID-in-Coastal-SC-low-res.pdf

Newly proposed FEMA flood maps for Kiawah are available at
http://chascogis.maps.arcgis.com/apps/View/index.html?appid=33df503a50284fcf8c4564930741a1b1