THE CITY OF KEY WEST
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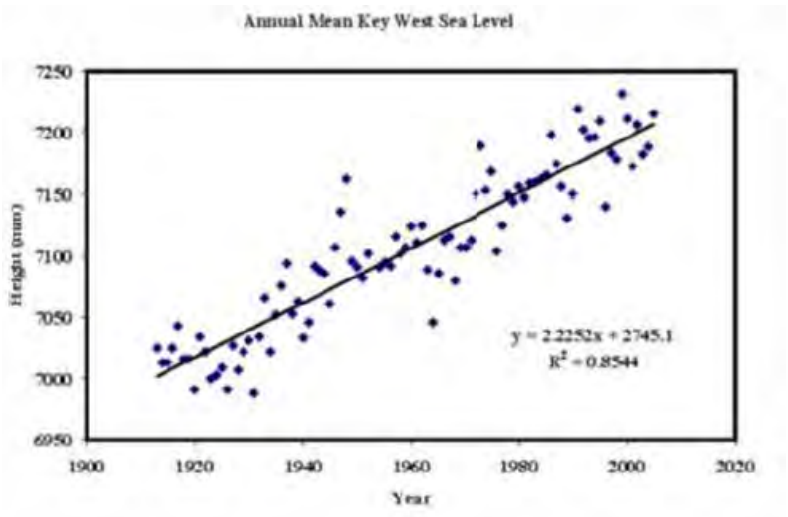
To: Stakeholder Groups
From: Division of Community Development Services
Date: May 22, 2014
Subject: Building Height – Referendum and LDR Amendment Process

Statement of Problem

The City of Key West is a low lying island with a maximum topographic elevation of 16' above sea level, leaving the city, its residents and assets vulnerable to flooding from high tides, storm surge and sea level rise. Furthermore, the island substrate is permeable limestone and cannot be buffered from water inundation. The City's adopted Climate Action Plan, consistent with regionally adopted standards, anticipates an increase in the number of intense storms in the region and predicts that sea levels will rise between 3" and 7" by 2030. According to NOAA tidal gauges, the tide has risen 9" since 1846 (Table 1), causing an increase in flooding throughout the city on a regular basis, limiting access to homes and businesses, and causing water damage during marginal rain storm events and/or high tides.

Table 1



According to the FEMA NFIP rate maps nearly 80% of the City is currently located within the Special Flood Hazard Area and susceptible to the negative effects of sea level rise. In order for the city to adequately protect the city's tax base and private property from high insurance cost and water damage it is critical that the City's Land Development Regulations facilitate property owners ability to elevate their property above the flood levels.

Conversely, the current building height restrictions do not anticipate the city's need to adapt for sea level rise and are too low to effectively adapt the existing and future housing

stock and commercial structures, built on small properties within a dense urban land fabric. Further, the height restrictions in the Land Development Regulations are restricted by the charter and subject to change only upon approval of a majority public vote at a general municipal election (Charter Section 1.05 (a).

Solution Statement

With the help of input from stakeholder groups that represent Historic Preservationists; Environmentalists and Quality of Life groups; and Property owners Architects, Builders and Developers, staff recommends that the City Commission consider placing a referendum on the November election ballot to consider allowing additional height for buildings that elevate their structures in order to construct livable area above flood levels, but that the maximum amount of height continue to be limited. At this time staff has discussed five distinct approaches to the referendum for discussion and consideration, including do nothing, based on the following facts, and issues and their possible solutions.

Why go through the process of amending LDR's related to building height?

1. *Roadblock to property protection* - Current building height restrictions create a roadblock for property owners attempting to protect their assets.
2. *Stable tax base* - Protecting property facilitates stability of property values.
3. *BW 12* - October 1, 2013 Biggert-Waters Flood Insurance Reform Act of 2012 became effective eliminating the National Flood Insurance Policy subsidy program. Although emergency corrective legislation has postponed the new flood insurance rates from taking effect. they are inevitable. For nonconforming properties located below required flood levels, which constitute a majority of the City, the rate increase will be significant. Cumulatively, and highly likely in the near future, large substantial insurance rate discounts are provided for elevating structures out of the floodplain; with steeper discounts for freeboard (additional height above freeboard) protection (see definition below and Exhibit 2 for examples).
4. *CRS Rating* - Creating a system that facilitates building flood elevation requirements would increase our CRS rating, systematically lowering everyone's flood insurance rates (see Exhibit 10 for additional information).
5. *FEMA NFIP Rate Map Changes looming* – In the next few years FEMA will begin the process of amending the local Flood Maps that dictate flood insurance rates. Likely the Map changes will result in a loss of 1 foot BFE citywide. This means structures that were previously elevated +1' above BFE will be back at BFE and lose the insurance rate discount for the +1' freeboard previously obtained. Therefore, it would be advantageous to elevate structures +1' higher in order to meet looming FEMA map changes and future requirements.
6. *Climate Change Action Plan* - Adopted science for Sea Level Rise anticipates 3-7" of rise by 2030 and 9-24" by 2060. Providing relief for buildings from sea level rise is consistent with the adopted plan.
7. *New BPAS units* - Maximum of 910 new residential BPAS units to be constructed by 2023 required to be built 1.5' above BFE. Mitigating flood hazard for all new residential construction is good planning.
8. *Timely* - LDR Amendment Overhaul Process beginning now.
9. *Best interest of Community* – A height allowance that is directly related to flood mitigation supports property owners by modifying regulations that prohibit them from protecting their property.

10. *Consistent with existing Comprehensive Plan Policy*:
    Comprehensive Plan Policy 1.1.12.5: Increased Height: The City shall consider allowing increased heights for new construction or redevelopment if such additional height is justified based on adopted Coastal High Hazard Maps and Storm Surge Flood Maps in order to promote safe new development and redevelopment based on sea level rise predictions. Such additional height must be compatible with surrounding development.
11. *Proactive approach* – Facilitates mitigation before the next disaster. Referendum is a lengthy process that should not be in reaction to a disaster, but rather facilitates adaptation before or in response to damage caused by the next big event.

Elements Taken into Consideration of Approaches

The following considerations for possible referendum approaches were discussed amongst staff and at stakeholder group meetings where meaningful public input was gathered.

- Amend height restrictions by changing the point where height is measured from instead of using the reference point of the crown of the road? Possibly use:
  - Base flood elevation as depicted in the NFIP Maps; or
  - Elevation of existing property based on individual flood elevation certificates.
- Future changes to flood insurance maps; future rate hikes; storm surge; sea level rise; and mitigation for flood insurance risk for 910 new Building Permit Allocation System units.
- Limit the number of stories allowed?
- Savings in flood insurance rates for elevating a structure above Base Flood Elevation (BFE).
- Changing character of the structural design pattern of the City, from ground floor entries to more structures on stilts, is not voluntary nor is it controlled by the City, the elevation of structures is *REQUIRED* by FEMA a Federal Agency.
- Require building elevation to build to an established freeboard level or continue with a voluntary program?
- Balance protection of the built environment (people's homes, businesses and public infrastructure) with protection of the City's character by:
  - Creating design standards in upcoming LDR amendments to mitigate changing character of neighborhoods as we build up.
  - Coordinate with HARC to balance protection of the historic structures with protection of the character of the historic district.
  - Consider creating a minimum an/or maximum cap on height allowance both at the freeboard level and the height of the structure.
- Consider Florida Building Code exception for historic contributing structures (FBC Ch. 11). The Building Code exception does not provide relief from the rising flood insurance rates.
- Consider whether the amendments should allow for protection of most of the existing structures or just some:
  - How much height is needed to protect almost all of the existing residential housing stock on the island? (Worst case scenario) Will the approach accommodate existing structures in the lowest lying areas (SF district)?
  - Is it more important to protect the character of the island at street level or moderately above, or to take a long-range approach to sea level rise and allow more significant height changes?
- November 4, 2014 – Timeline for ballot request (see Exhibit 1 attached schedule).

- The holding of a referendum is at no cost to the City.

Specific Concerns Related to the Historic District

During stakeholder group meetings, concern about the negative impact to the Historic District have arisen. Planning Staff, including the Historic Preservation Planner are sensitive to the impacts that will occur there, but have to balance the need to protect the historic buildings from rising and flood water damage and rising insurance rates. Properties that are listed as Historically Contributing, or are located within the X zone are exempt from meeting FEMA flood elevation requirements; however, Historically Contributing they ARE NOT exempt from flood insurance rate hikes. At this time the Historic Guidelines have a policy that requires permit review, on a site-by-site basis, for properties that wish to elevate above the required FEMA Flood elevation. It is anticipated that the Historic Guidelines will be amended to provide both flexibility and protection of the character of the Historic District, weather the referendum is approved or not.

Flood Insurance Terms and Savings

Base Flood Elevation (BFE) – The height to which the lowest living floor of a building within a special flood hazard area is required to be elevated to as it relates to sea level as depicted on the FEMA National Flood Insurance Rate Maps FIRM).

Floodproofing – Means elevating a structure out of the flood level (required for residential structures) or providing a type of design that allows water to flow beneath or through a building such as breakaway walls or flood vents (allowed for commercial uses).

Flood Insurance Rate Map (FIRM) - The official map of the community, on which FEMA has delineated both special flood hazard areas and the risk premium zones applicable to the community [Also defined in FBC, B, Section 1612.2.].

Freeboard – the area between the Base Flood Elevation (BFE) and the joist of the first floor of the structure. The Florida Building Code requires new and substantially renovated residential structures to elevate one foot (1') of freeboard above Base Flood Elevation. The cost of flood insurance for residential and commercial properties decreases for every foot of freeboard for up to 3'.

- Residential Properties Cost Benefit: Estimated local insurance cost savings for residential structures is maximized at an elevation of three (3') of freeboard above Base Flood Elevation:
    - +1' Freeboard = approximately 87% annual savings
    - +2' Freeboard = approximately 90% annual savings
    - +3' Freeboard = approximately 94% annual savings

- Commercial Properties Cost Benefit: For commercial properties there is a similar insurance cost savings for elevating or floodproofing a structure, when the minimum floodproofing height is exceeded. As with the freeboard discount for residential properties, the floodproofing freeboard credit is maximized at +3' above BFE.

  ****Please note that during the next few years FEMA will be revising the local flood maps and likely each flood zone will be increased by 1'. This means that structures that elevate 3' of freeboard today, will only have 2' of freeboard in the near future and their insurance rates will**

rise accordingly. It is for this reason that 4' of freeboard is suggested as an alternative for maximum base floor elevation allowance in all referendum language.

Special flood hazard area - An area in the floodplain subject to a one-percent or greater chance of flooding in any given year. Special flood hazard areas are shown on FIRMs as Zone A, AO,A1-A30, AE, A99, AH, V1-V30, VE or V [Also defined in FBC, B Section 1612.2.].

Referendum Language Draft Approaches – At the April 1, 2014 City Commission Meeting staff prepared a report for discussion of a potential height referendum. The report provided the Commission one (1) Referendum Language option with a list of topics that staff had considered when drafting the report. The Commission supported the idea of the potential height referendum with the understanding that stakeholder and City Attorney input were still required. It is the responsibility of the Focus Group to now help staff create an approach that is clear and understandable and is tolerable, meaning the approach will have the strength to stand on its

Referendum Language (75 words or less): Staff has provided the following options for consideration of referendum language:

In order to provide the City with the most reasonable approach to changing height possible.

Option 1. To protect homes and businesses against flood damage and lessen the cost of flood insurance citywide, should the building height restrictions contained in the land development regulations be amended, in areas wherein the maximum building height is 35 feet or less, to allow one foot of additional building height for each one foot of elevation necessary to achieve the base flood elevation or above for up to 5 feet within the regulated flood zones on NFIP's rate map?

Positive and Negative Considerations of Option 1.

Positive

1. Protects the existing height and character of districts outside of the Special Flood Hazard Areas such as the majority of the Historic District.
2. All of residential neighborhoods would still maintain a maximum height of 35-40'. Below Tree height.
3. Responds to Federal and local request to begin to improve the City's Community Rating System (CRS) by FEMA.
4. Shows leadership on a national level.
5. Provides flexibility for upcoming FEMA Flood Map amendments (2018ish).
6. Accommodates potential 3' sea level rise predictions.
7. In some cases it may provide space for property owners to park or have storage beneath the house.
8. Potential to invite development – raising property values.
9. Limits amount of legislative changes necessary (see below).

Negative

1. The character of the traditional, ground level neighborhoods, characteristic of the single family zoning district, will begin to change. Particularly in the lowest places on the island.
2. Perception of massing and scale.

Option 2. To protect homes and businesses against flood damage and lessen the cost of flood insurance citywide, should the building height restrictions contained in the land development regulations be amended, in areas wherein the maximum building height is 35 feet or less, to allow one foot of additional building height for each one foot of elevation necessary to elevate buildings to the minimum flood elevation and up to 3-4' of freeboard within the regulated flood zones?

Positive and Negative Considerations of Option 2.

Positive

1. Provides protection of the height restrictions while ensuring that **most** existing buildings (particularly residential) can be elevated to meet FEMA and Florida Building Code requirements (BFE +1).
2. Provides flexibility for voluntary elevation of the structure of up to 3-4' of freeboard in order to prepare for sea level rise and changing NFIP Maps.
3. Allows property owners to maximize flood insurance savings for 3' of freeboard.
4. Protects the existing height within reason
5. Responds to Federal and local request to move towards improvements to the City's Community Rating System (CRS) by FEMA.
6. Shows leadership on a national level.
7. Provides flexibility for future FEMA Flood Map amendments.
8. Accommodates potential 3' sea level rise predictions.
9. Potential to invite development – raising property values.
10. Limited amount of legislative changes necessary (see below).

Negative

1. The character of the traditional, ground level neighborhoods, characteristic of the single family zoning district, will begin to change. Particularly in the lowest places on the island.
2. Perception of massing and scale.
3. This approach would not guarantee a max height of 35-40'.

Option 3. To protect homes and businesses against flood damage and lessen the cost of flood insurance citywide, should the definition of building height contained in the land development regulations be amended to require height be measured from the NFIP Rate Map Base Flood Elevation, instead of the crown of the road, to protect buildings against flood damage and lessen the cost of flood insurance citywide?

Positive and Negative Considerations of Option 3.

Positive

1. Based on the Federal elevation requirements for flood prevention

2. Responds to Federal and local request to improve the City's Community Rating System (CRS) by FEMA.
3. Shows leadership on a national level.
4. Provides flexibility for future FEMA Flood Map amendments.
5. Accommodates potential 3' sea level rise predictions.
6. In some cases it may provide space for property owners to park or have storage beneath the house.
7. Potential to invite development – raising property values.

Negative

1. The character of the traditional, ground level neighborhoods, characteristic of the single family zoning district, will begin to change. Particularly in the lowest places on the island.
2. This option allows the greatest height changes
3. This approach changes where height is measured from therefore changing the baseline that has already been used to create the city's massing and scale.
4. More legislative changes necessary (see below).

Option 4. To protect against flood damage and lessen the cost of flood insurance citywide, should the definition of building height contained in the land development regulations be amended to require height to be measured from the existing grade of the property as measured by a property specific Elevation Certificate instead of the crown of the road?

<u>Positive and Negative Considerations of Option 4.</u>

Positive

1. Based on the actual elevation of a property
2. May respond to Federal and local request to improve the City's Community Rating System (CRS) by FEMA.

Negative

1. Difficult to understand.
2. The character of the traditional, ground level neighborhoods, characteristic of the single family zoning district, will begin to change. Particularly in the lowest places on the island.
3. Perception of massing and scale
4. Does not provide flexibility for future FEMA Flood Map amendments.
5. This approach changes where height is measured from therefore changing the baseline that has already been used to create the city's massing and scale.
6. This approach will help the least amount of properties.
7. More legislative changes necessary (see below).

Option 5. Do nothing

<u>Positive and Negative Considerations of Option 5.</u>

Positive

1. Protects the existing height of the city
2. No additional work for staff

Negative

1. Does not respond to Federal and local request to improve the City's Community Rating System (CRS) by FEMA.
2. Does not provide a mechanism to alleviate the FEMA elevation requirements.
3. Limits ability to adapt to future FEMA Flood Map amendments.
4. Will result in additional height variances.
5. May result in more costly demolition of existing structures instead of the retrofit or elevation of existing structures.
6. May result in takings
7. More and more private and public property will be subject to flooding and or insurance defaults due to height restrictions that prevent existing structures
8. Land Development Regulations will continue to prevent new or existing structures from elevating to protect themselves from rising sea level, storm surge, high tides, heavy rain events and raising insurance rates. The city may be subject to lawsuit.
9. Many properties may go into foreclosure due to inability to pay high flood insurance costs.
10. Tax base may be negatively affected.
11. The City's CRS rating will remain stagnant and low, and citywide flood insurance rates will remain high.

Legislative Considerations:

Options 1-4 are supported by Comprehensive Plan Policy 1.1.12.5 for Increased Height as described above; although, other legislative changes would be required dependent on the approach as follows:

Option #1 and #2 supports limited policy amendments to the Land Development Regulations and HARC Guidelines as follows:

- **Changes to the LDR's would be limited to new language in Chapter 122** including: the Supplemental District Regulations, and perhaps the addition of references to each zoning district Section for clarity.
- **HARC Guidelines Amendments:**
  - New Construction (p. 38, #2) – Revise policy related to elevation of building above FEMA requirements.

Options #3 and #4 require changes to the Comprehensive Plan, Land Development Regulations and HARC Guidelines as follows:

- **Amend Comprehensive Plan** Policy 1-1.1.3: Intensity Defined:
  Policy 1-1.1.3: Intensity Defined. …The term "building height" as used in the Land Development Regulations shall mean the vertical distance from the crown of the nearest adjacent street to the highest point of the proposed building….
- **Amend the Land Development Regulations for:**
  - Chapter 86-9 - definition of "Building Height".

  - Section 122-1149. Height.
- **HARC Guidelines Amendments:**
  - New Construction (p. 38, #2) – Revise policy related to elevation of building above FEMA requirements.

Option #5 does not require any legislative changes

Focus Groups and Key Partners

FIRM, Board of Realtors, Sustainability Advisory Board, Last Stand, USGBC, GLEE, HARC, Insurance Companies, Architect organizations, Planners Forum, County and State, Developers and Public Participants, Historic Preservation groups, and the Chamber of Commerce.

Attachments:

1. Exhibit 1 - 2014 Referendum and LDR Amendments Timeline
2. Exhibit 2 – BW 12 Update. 20140305 email form Scott Fraser
3. Exhibit 3 – Massachusetts Coastal Zone Management Smart Cost information
4. Exhibit 4 - FEMA NFIP rate maps (X-zone) and complete City BFE Map
5. Exhibit 5 - District Map
6. Exhibit 6 – 2011 Key West Stormwater Master Plan Topography Map
7. Exhibit 7 – City of Key West Storm Surge Map, Engineering Services, 2012
8. Exhibit 8 – Adopted Comprehensive Plan Coastal High Hazard and Storm Surge Map
9. Exhibit 9 – FEMA Repetitive Loss and Severe Repetitive Loss Map
10. Exhibit 10 – CRS points system and insurance rates description

Exhibit 1

2014 Height Referendum and LDR Amendments Timeline

January 13, 2014	Timeline Development
January 15 and 17, 2014	Staff Meetings - Approach
February	Draft Referendum language
March	Meet with City Commissioners
April 1, 2014	City Commission Meeting – Discussion item
April - June, 2014	Focus Group Outreach and Meetings
April 10, 2014	Sustainability Board discussion
April 14, 2014	Last Stand discussion
April 29, 2014	League of Woman Voters discussion
May 7, 2014	HARC discussion
May 7, 2014	FIRM discussion
May, 2014	Chamber of Commerce
May 15, 2014	Planning Board discussion
June 12, 2014	Sustainability Board discussion
June, 2014	Key West Board of Realtors discussion
June 10, 2014	City Attorney Legistar agenda deadline
June 17, 2014	City Clerk Advertising deadline
July 1, 2014	City Commission Consideration of Referendum language – 1st reading
August 5, 2014	If necessary: City Commission Consideration of Referendum language – 2nd reading
August 19, 2014	Last day to submit Referendum information to MC Supervisor of Elections
August - November, 2014	Education Campaign – City and Partners
November 4, 2014	Election Day
November 20, 2014	LDR Amendment – Planning Board consideration
January 6, 2015	LDR Amendment - City Commission consideration, 1st reading
January 20, 2015	LDR Amendment - City Commission Meeting, 2nd reading. Begin 30 day local appeal period.
February 20, 2015	Transmit LDR Amendment to the State. 60 day a
May 10, 2015	LDR amendment becomes final. NOI posted and appeal period ends.

Exhibit 2

Nicole Malo

From: Scott Fraser
Sent: Wednesday, March 05, 2014 2:56 PM
To: Ron Wampler; Shawn Smith; Larry Erskine; Planning Department
Subject: BW-Fix: House Bill 3370 Passed Last Night

As I feared, the bill passed last night by the US House doesn't seem to forestall massive rate increases for Pre-FIRM properties now being required to produce Elevation Certificates for the first time.

In the past, Pre-FIRM properties - those built prior to the flood maps (before 1975) - were all presumed below flood to some undetermined depth, and all rated essentially the same. BW-12 changed that universal Pre-FIRM rating.

For the first time, Pre-FIRM policy renewals require Elevation Certificates. Each building is then specifically rated relative to its depth below the flood level for that area.

The greatest impact has been to Pre-FIRM properties that are two or more feet below flood. These Submit-For-Rate policies can't be quoted by local insurance agents, and must be quoted by FEMA.

Homes one foot or so below flood will likely experience moderate increases. One property I'm aware of, where the building is about seven inches below flood is increasing from about $6k annually to $9k, gradually during the next few years.

Homes four or six feet below flood, are likely to still suffer massive increases.

However, there's a lot of seemingly double-speak in the bill's convoluted language. We likely won't know how this will all flush-out until FEMA interprets this bill and begins to apply it to actual premiums.

Here's bullet-list of changes from last night House vote (still has to return to the Senate for concurrence):

- Eliminates trigger to full actuarial rates on point of sale; allows assumption of existing flood insurance policies by new property owners. *[This should be a great relief to the local real estate, title and banking industries, that experienced an immediate loss of business beginning last Oct. 1st.]*
-
- Creates longer glide path for eventually eliminating the Pre-FIRM subsidy on all properties. Provides for increases of at least 5 percent annually of the current premium (but also subject to the total premium increase cap of either 15 or 25 percent).
-
- Provides for an optional higher deductible ($10,000) for residential properties.
-
- Eliminates Section 207 related to grandfathered rates when maps change. *[Key West won't likely be remapped until 2017-18.]*
-
- Requires a surcharge on all flood insurance policies to pay for the longer glide path. $250 per policy for second homes and businesses, and $25 per policy for all other structures.
-
- Mostly provides relief for certain residences, not policies for commercial properties, second homes nor those considered Repetitive Loss Properties (approximately 230 in Key West).

Bottom Line:

Owners of Pre-FIRM homes, two or more feet below flood, will need to seriously consider elevating their residences to ensure affordability of flood insurance...

or...

Contemplate methods of paying off their federally backed mortgages to escape the flood insurance coverage requirement.

Scott

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Exhibit 3

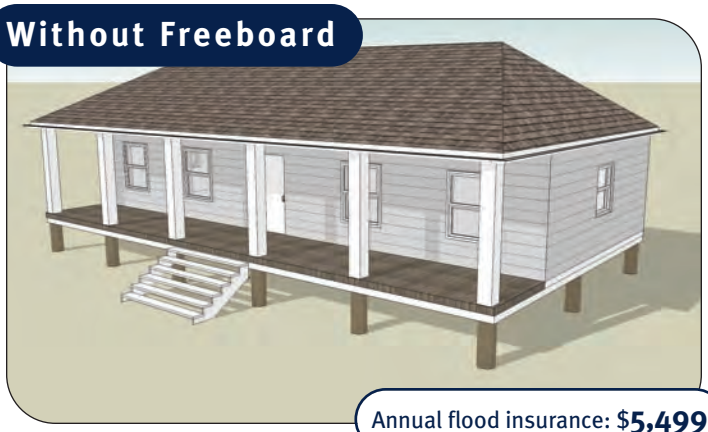
fact sheet 5

stormsmart coasts

Raise Your Home, Lower Your Monthly Payments

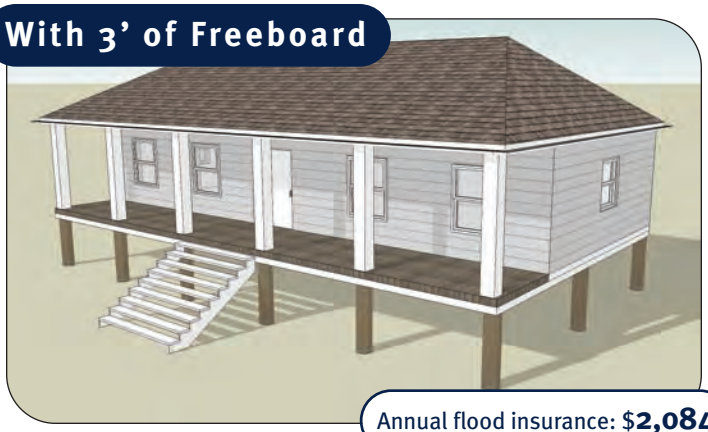
Protect buildings and reduce monthly expenses with freeboard

Without Freeboard



Annual flood insurance: $**5,499**

With 3' of Freeboard



Annual flood insurance: $**2,084**

Elevating a home a few feet above legally mandated heights has very little effect on its overall look, yet it can lead to substantial reductions in flood insurance, substantially decrease the chances the home will be damaged by storms and flooding, and help protect against sea level rise.

What Is Freeboard?

Freeboard is elevating a building's lowest floor above predicted flood elevations by a small additional height (generally 1-3 feet above National Flood Insurance Program [NFIP] minimum height requirements). Elevating a home a few feet above legally mandated heights has very little effect on its overall look, yet it can lead to substantial reductions in flood insurance, significantly decrease the chances the home will be damaged by storms and flooding, and help protect against sea level rise.

What Are the Benefits of Freeboard?

Increased protection from floods and storms. Storm waters can and do rise higher than shown on Flood Insurance Rate Maps (FIRMs). Freeboard helps protect buildings from storms larger than those that FIRMs are based on, and provides an added margin of safety to address the flood modeling and mapping uncertainties associated with FIRMs.

Better preparation for ongoing sea level rise. Massachusetts has experienced a relative sea level rise of approximately 1 foot over the past 100 years. Since elevations on FIRMs do not include sea level rise, freeboard will help keep structures above floodwaters as storm surge elevations increase.

Greatly reduced flood insurance premiums. Recognizing that freeboard reduces flood risk, the Federal Emergency Management Agency (FEMA, which administers the NFIP) provides substantial (sometimes more than 50 percent) reductions in flood insurance premiums for structures incorporating freeboard. These savings can rapidly accumulate, especially over the life of a normal mortgage.

Example of savings on NFIP premiums[1] with freeboard

V Zone[2]	Annual savings in NFIP premiums	Savings over 30-year mortgage
1' freeboard	$1,360 (25%)	$40,800
2' freeboard	$2,730 (50%)	$81,900
3' freeboard	$3,415 (62%)	$102,450

A Zone[3]	Annual savings in NFIP premiums	Savings over 30-year mortgage
	$502 (41%)	$15,060
	$678 (55%)	$20,340
	$743 (60%)	$22,290

[1] **NFIP premiums** based on May 2007 rates for a one-floor residential structure with no basement built after a FIRM was issued for the community (post-FIRM rates differ from pre-FIRM rates). $500 deductible/$250,000 coverage for the building/$100,000 for contents.

[2] **V zones**: This Flood Insurance Rate Map (FIRM) designation refers to coastal areas that are subject to the highest levels of wave energy and flooding.

[3] **A zones**: Also a FIRM designation, coastal A zones are subject to flooding but with less wave energy than V zones (i.e., wave heights less than 3 feet).

What Are the Costs of Freeboard?

The expense of incorporating freeboard into new structures is surprisingly low, generally adding only about 0.25 to 1.5 percent to the total construction costs for each foot of added height, according to a 2006 FEMA-commissioned study (*Evaluation of the National Flood Insurance Program's Building Standards*). The minor resulting increase in monthly mortgage payments is generally more than offset by savings on NFIP premiums. Consequently, adding freeboard typically saves homeowners money.

Consider, for example, a proposed one-story building in the V zone[2] that will cost $250,000 to build at minimum legal standards (the NFIP requires that all homes in the floodplain be elevated to at least the base flood elevation [BFE], mapped on FIRMs). According to the study cited above, adding each foot of freeboard to a home on piles or piers adds about 0.4 percent to total construction costs (about $1,000 a foot in this example). If the owner takes out a mortgage at 6.5 percent APR for the total construction costs, he or she will have lower monthly payments (mortgage plus NFIP premiums) with 3 feet of freeboard, even though the construction costs are higher.

Home at minimum legal height

Monthly mortgage payments	$1,580.17	
Monthly flood insurance	+ $458.25	
Total monthly cost	**= $2,038.42**	

Home with 3' of freeboard

Monthly mortgage payments	$1,599.13	(+$18.96)
Monthly flood insurance	+ $173.67	(-$284.58)
Total monthly cost	**= $1,772.80**	**(-$265.62)**

In this example, adding 3 feet of freeboard saves the homeowner $265.62 per month, or $95,623.67 over a 30-year mortgage. Benefits in A zones[3] are generally less dramatic, but still substantial. To determine NFIP premiums for a specific property, see a licensed insurance agent.

Who Can Benefit from Freeboard?

Nearly everyone building in floodplains can better protect themselves and their property and save on flood insurance by including freeboard into their construction and reconstruction projects. Additional benefits include:

- **Homeowners** - Whether or not you live in the house year-round, having it elevated increases the chances that it will weather storms safely, decreasing your worry and protecting your investment. If you're building a new home, or doing a renovation, ask your builder/designer about incorporating freeboard.
- **Builders/contractors** - Freeboard provides a competitive edge over other builders, allowing you to market the benefits of reduced flood insurance and flood risk to potential buyers. When doing retrofits (especially those requiring bringing structures up to current NFIP standards), explain the benefits of freeboard to your clients.
- **Municipalities** - Encourage the use of freeboard in appropriate private and public construction throughout your community's floodplain. (NOTE: The Massachusetts Attorney General's office has recently rejected bylaws requiring freeboard, but municipalities may promote its use.)
- **Businesses** - Freeboard helps: protect your buildings, important records, and inventory from flooding; drastically decrease your recovery/clean-up time after storm; and potentially save your business. The Institute for Business and Home Safety reports that more than 25 percent of businesses that close due to storm damage never reopen.

For More Information . . .

- For technical details on costs of using different flood-resistant building techniques (including freeboard), see the American Institutes for Research's *Evaluation of the National Flood Insurance Program's Building Standards* 2006 study at www.fema.gov/library/viewRecord.do?id=2592.
- For general information on the National Flood Insurance Program, see www.FloodSmart.gov.
- For specific questions on flood insurance rates, see a licensed insurance agent.
- Communities looking for more information on the National Flood Insurance Program can contact Richard Zingarelli, Massachusetts NFIP Coordinator: (617) 626-1406, Richard.Zingarelli@state.ma.us.
- For general information on how Massachusetts communities can protect themselves from storms, see the StormSmart Coasts website at mass.gov/czm/stormsmart.
- Businesses looking to prepare for storms and other catastrophic events should visit the Institute for Business and Home Safety's website at www.ibhs.org.

Executive Office of Energy and Environmental Affairs
Ian A. Bowles, Secretary

Commonwealth of Massachusetts
Deval L. Patrick, Governor
Timothy P. Murray, Lieutenant Governor

Massachusetts Office of Coastal Zone Management
Deerin Babb-Brott, Director
Bruce K. Carlisle, Assistant Director

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This fact sheet was developed through CZM's StormSmart Coasts program, which supports community efforts to manage coastal floodplains. For further information on StormSmart Coasts, visit **www.mass.gov/czm/stormsmart**.

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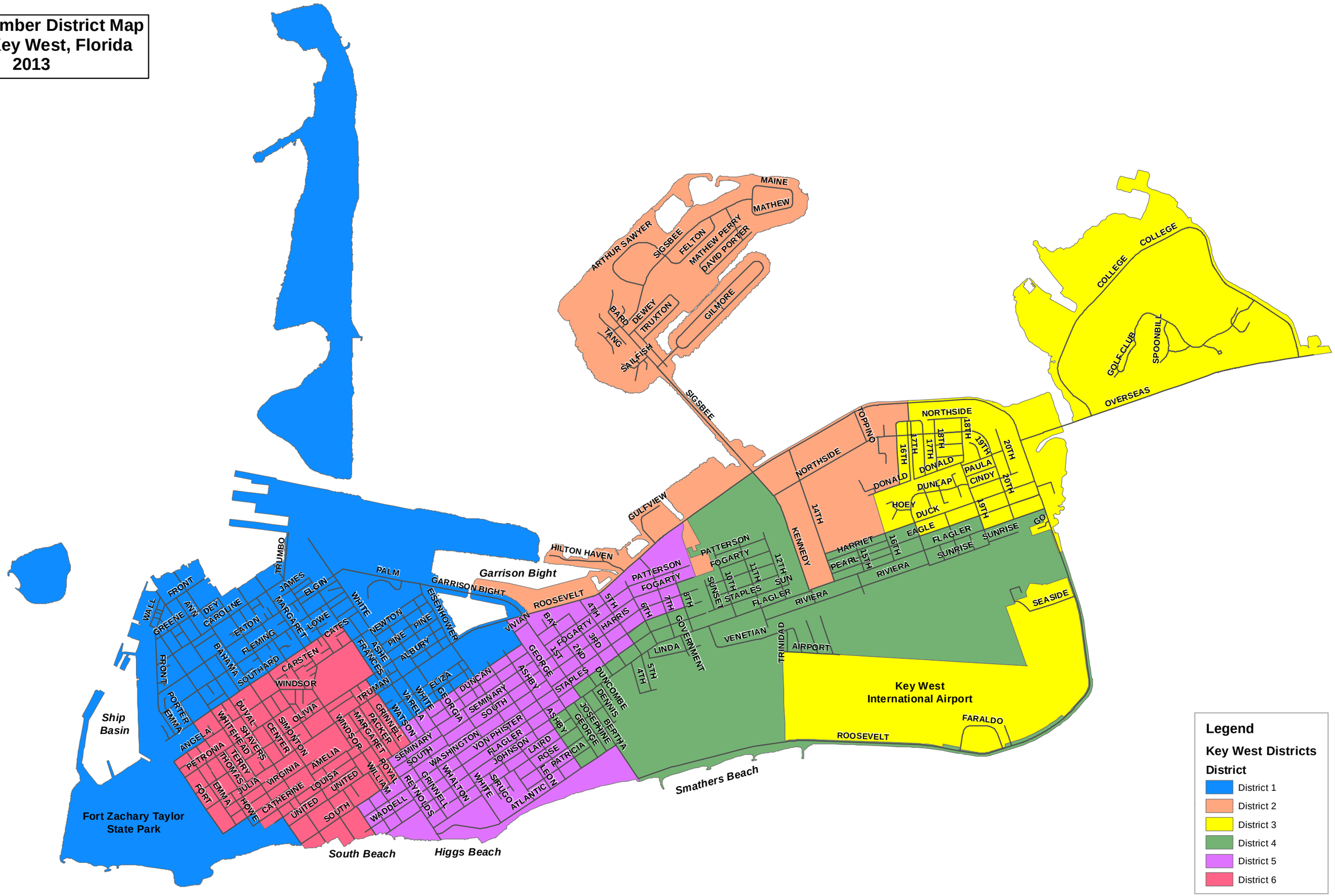
Map Exhibits 4-9

Frankfort Bank
Panel Number: 12087C1508K
Panel Number: 12087C1509K
Panel Number: 12087C1516K
Panel Number: 12087C1517K
Zone VE (EL13)
Zone VE (EL10)
Zone AE (EL6)
Zone AE (EL7)
Zone AE (EL8)
Zone AE (EL10)
Zone VE (EL12)
Zone X (EL-9999)
Zone 0.2 PCT ANNUAL CHANCE FLOOD HAZARD (EL-9999)
OPEN WATER (EL-9999)
Key West Bight
Garrison Bight
Palm Ave
Flagler Ave
N Roosevelt Blvd
S Roosevelt Blvd
Key West Cemetery
Key West International Airport
Smathers Beach
White Street Pier
Southernmost Point
Key West Butterfly & Nature Conservatory
Higgs Beach Dog Park
CB Harvey Rest Beach Park
Thompson Island

X-Zones Shaded Areas

8/16/11

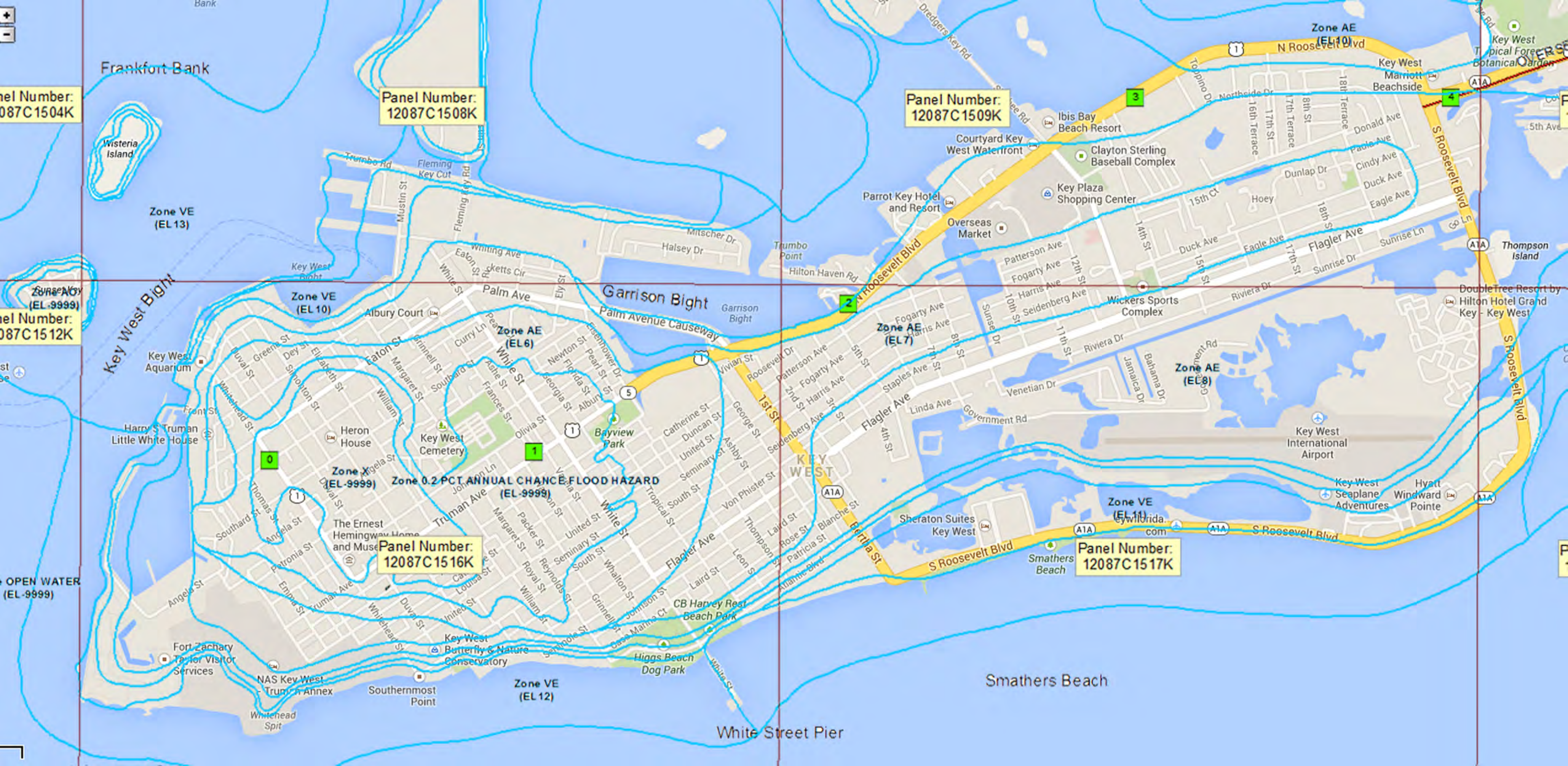
Single Member District Map
City of Key West, Florida
2013



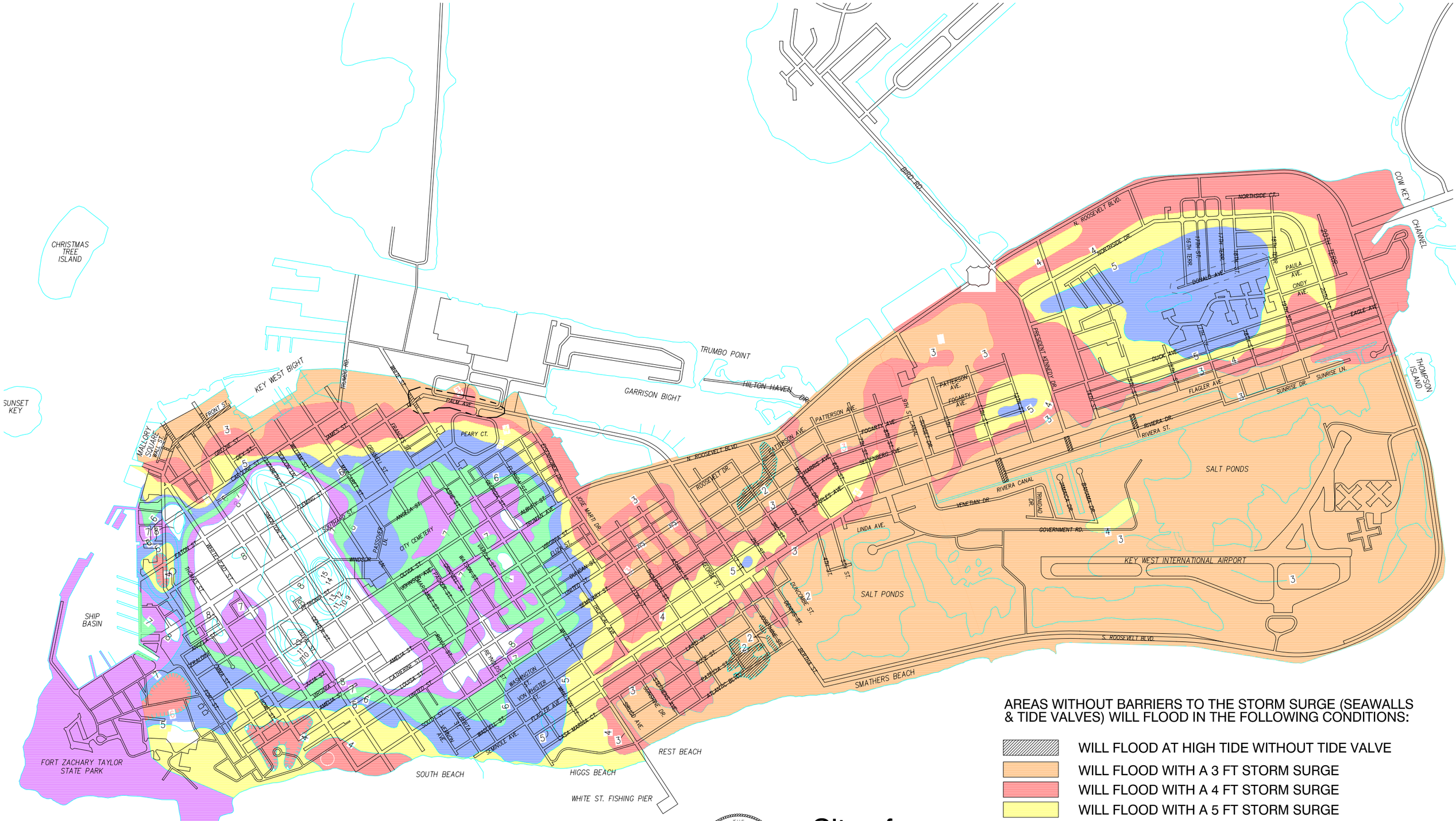
Data Source: Monroe County - Growth Management - GIS

Only City sub-basins contributing runoff to City-maintained outfalls are shown. City areas draining directly to Gulf, Ocean, or canals are not modeled, but are still managed for potential water quality effects.

Exhibit 2-2
Topography
Key West Stormwater Master Plan
Key West, Florida



Frankfort Bank
Panel Number:
12087C1508K
Panel Number:
12087C1509K
Panel Number:
12087C1516K
Panel Number:
12087C1517K
Zone VE
(EL 13)
Zone VE
(EL 10)
Zone AE
(EL 6)
Zone AE
(EL 7)
Zone AE
(EL 8)
Zone AE
(EL 10)
Zone VE
(EL 11)
Zone VE
(EL 12)
Zone X
(EL-9999)
Zone 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
(EL-9999)
Wisteria Island
Key West Bight
Garrison Bight
Palm Avenue Causeway
Key West Aquarium
Harry S Truman Little White House
Heron House
Key West Cemetery
Bayview Park
The Ernest Hemingway Home and Museum
Fort Zachary Taylor Visitor Services
NAS Key West - Truman Annex
Southernmost Point
Key West Butterfly & Nature Conservatory
Higgs Beach Dog Park
CB Harvey Rest Beach Park
White Street Pier
Smathers Beach
Key West International Airport
Key West Seaplane Adventures
Hyatt Windward Pointe
Sheraton Suites Key West
Wickers Sports Complex
Overseas Market
Key Plaza Shopping Center
Clayton Sterling Baseball Complex
Ibis Bay Beach Resort
Courtyard Key West Waterfront
Parrot Key Hotel and Resort
Key West Marriott Beachside
Thompson Island
DoubleTree Resort by Hilton Hotel Grand Key - Key West
Trumbo Point
Albury Court
KEY WEST
N Roosevelt Blvd
S Roosevelt Blvd
Flagler Ave
Palm Ave
Truman Ave
White St
1st St
Bertha St



AREAS WITHOUT BARRIERS TO THE STORM SURGE (SEAWALLS & TIDE VALVES) WILL FLOOD IN THE FOLLOWING CONDITIONS:

- WILL FLOOD AT HIGH TIDE WITHOUT TIDE VALVE
- WILL FLOOD WITH A 3 FT STORM SURGE
- WILL FLOOD WITH A 4 FT STORM SURGE
- WILL FLOOD WITH A 5 FT STORM SURGE
- WILL FLOOD WITH A 6 FT STORM SURGE
- WILL FLOOD WITH A 7 FT STORM SURGE
- WILL FLOOD WITH A 8 FT STORM SURGE

STORM TIDE = STORM SURGE + ASTRONOMICAL TIDE

SEAL OF THE CITY OF KEY WEST, FLORIDA

City of Key West

ENGINEERING SERVICES

DWG. NO.: B-483 10/03/05

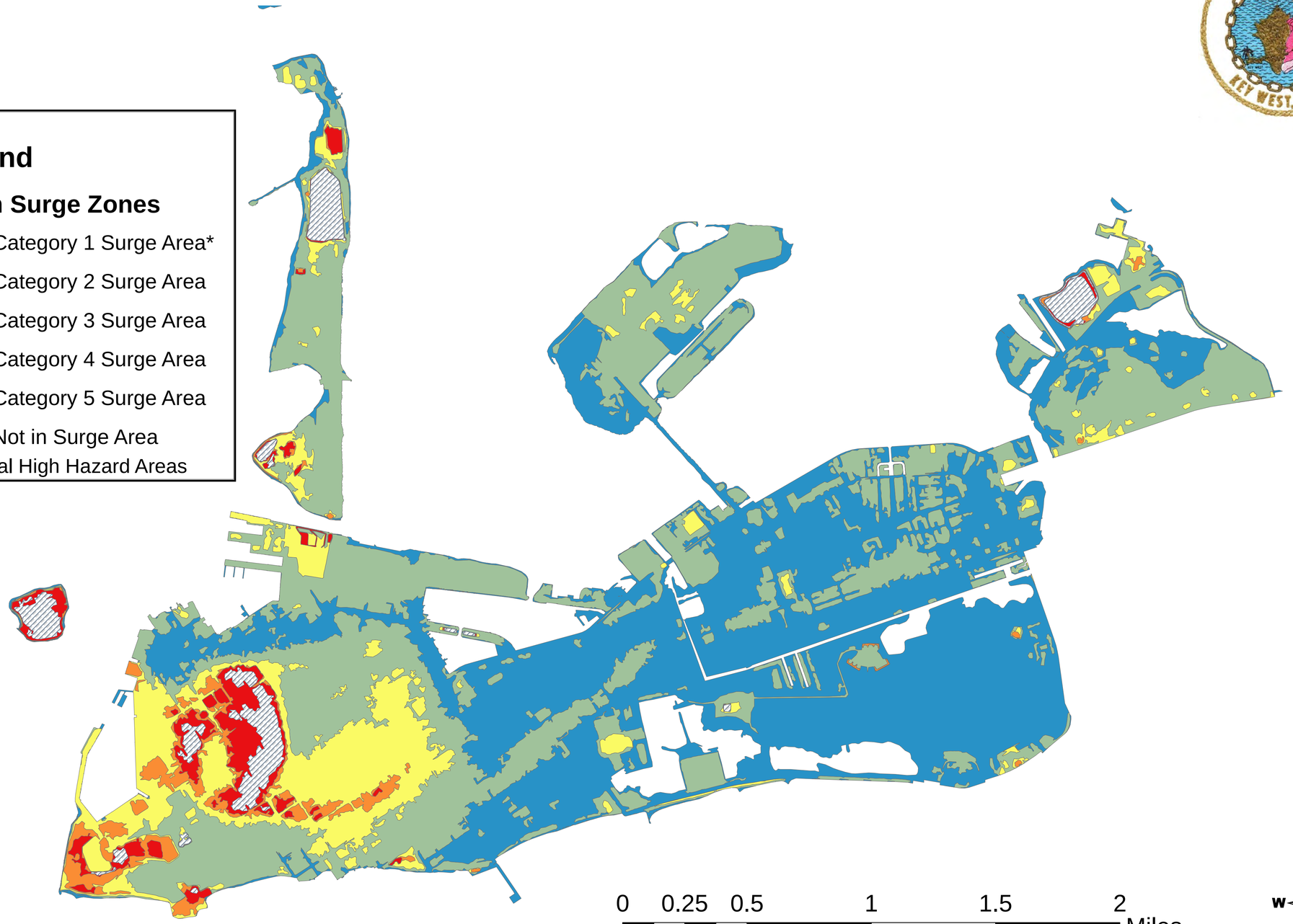
This map shows areas of the City that are subject to inundation by storm surge associated with hurricane events.
The Category 1 Surge Area is the City's Coastal High Hazard Area. Data Source: Statewide Regional Evacuation Study Program.

Legend

Storm Surge Zones

- Category 1 Surge Area*
- Category 2 Surge Area
- Category 3 Surge Area
- Category 4 Surge Area
- Category 5 Surge Area
- Not in Surge Area

* Coastal High Hazard Areas



CITY OF KEY WEST - Storm Surge Zones - October 2012

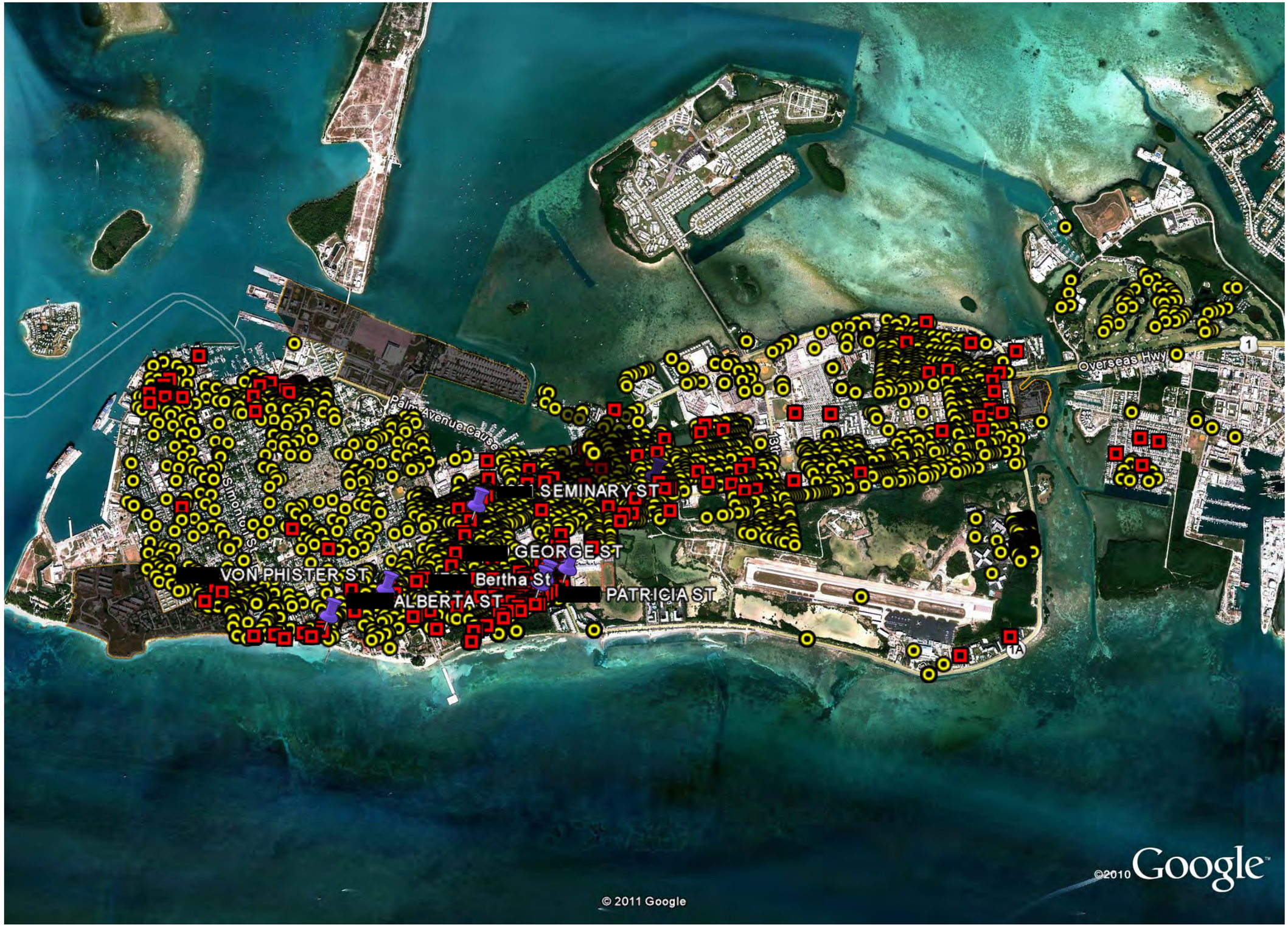

Overseas Hwy
1
Palm Avenue Causeway
SEMINARY ST
GEORGE ST
VON PHISTER ST
Bertha St
PATRICIA ST
ALBERTA ST
1A
©2010 Google
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Exhibit 10

Community Rating System (CRS) Points system and insurance rates

This report is intended to explain the freeboard credit opportunities offered by the CRS/ FEMA in order to further reduce insurance rates. It will further inform the reader about additional flood insurance rate opportunities that are available to the City; however, the proposed referendum language does not include freeboard requirements explained below.

The City is currently in the process of reapplying to become part of the NFIP's Community Rating System (CRS). Once the City can prove intent to comply with FEMA requirements and is allowed to participate in the Community Rating System, overall flood insurance rates will be reduced throughout the City. There are additional regulatory measures the City can take to increase our CRS rating, and reduce insurance rates further, including freeboard credits. In order to receive CRS credit for freeboard the following must be considered:

Although allowing property owners to voluntarily elevate to a desired freeboard elevation **may** generate **minimal** CRS point advantage, the Code needs to have a freeboard requirement in order to receive full freeboard CRS credit. This would result in a Code requirement that new buildings and those substantially improved, must be elevated to a specified freeboard elevation (IE: BFE + 2', 3' or 4').

Commercial Structures:

For **full** CRS points, the freeboard requirement must include that Floodproofed structures also need to be elevated to the required freeboard elevation requirement.

Mechanical Equipment:

For **full** CRS points, the freeboard requirement must include the same elevation - or floodproofing - for all mechanical systems (ductwork*, electrical, heating, ventilation, plumbing, A/C equipment and other service facilities. *No adequate and reasonably priced waterproofing of ductwork has yet been identified).

- If buildings have a freeboard requirement, but the mechanical systems noted above only require elevation to BFE than the CRS credit is 75% of the full credit.
- If buildings have a freeboard requirement, then the mechanical systems listed above must be elevated to at least BFE. If not, there isn't any CRS credit for freeboard.

CRS Point System Standards and Cost Benefit analysis

For every 500 points the CRS rating is elevated one class, or an additional 5% off insurance rates. CRS Credits are given for up to 3-feet of freeboard as follows:

- Freeboard of 3' = 375 CRS Points (Results in 2' of additional freeboard over the 1' FBC freeboard requirement).
- Freeboard of 2' = 325 CRS points (Results in 1' of additional freeboard over the 1' FBC freeboard requirement).

- Freeboard of 1'= 100 CRS points (presently required by FBC).
- Beyond 3', special credit is only available if the City provides additional information to warrant the higher credit, such as a demonstrated expectation of new growth in the area.

Additional CRS points are awarded if the City creates regulations that:

- Prohibits construction on fill = 80 points
- Requires compensatory storage if fill is utilized = 25 points