



## **City of Fort Lauderdale Frequently Asked Questions Proposed Sea Wall Ordinance**

The City of Fort Lauderdale is considering amending the Unified Land Development Regulations of the City of Fort Lauderdale Section 47-19.3 Boat Slips, Docks, Boat Davits, Hoists, and Similar Mooring Structures. This amendment is intended to improve coastal resilience and mitigate the effects of tidal flooding and sea level rise.

### **1. What are the major changes in the proposed seawall ordinance?**

The existing ordinance sets a maximum elevation for all new seawalls at five and one-half (5½) feet above NGVD29, except when the adjacent property is higher than five and one-half (5½) feet above the NGVD29 (3.90 feet NAVD88).

The Commission is considering the following changes in the proposed ordinance:

- Adds definitions for seawall, North American Vertical Datum (NAVD88) and rip rap;
- Sets a minimum seawall elevation at 3.9 feet NAVD88 (current allowable maximum);
- Recommends design of new seawalls for future height adjustment up to 5.0 feet NAVD88;
- Sets an allowable maximum height of the seawall based on a property's base flood elevation and provides a waiver option for properties with a finished floor less than 3.9 feet NAVD88;
- Requires seawall reconstruction to the minimum elevation if the substantial repair threshold is triggered;
- Requires maintaining seawalls in good repair and sets a timeline of 365 days for completion of repairs if cited;
- Requires owners to prevent tidal waters entering their property from impacting others and sets a timeline of 365 days for remedy if cited;
- Allows fixed docks to extend 10 inches above the adjacent seawall; and
- Allows for floating docks and requires them to be permitted and permanently attached.

### **2. Why are we changing the ordinance at this time?**

During September of 2015, the City of Fort Lauderdale experienced a King Tide that was predicted to be 8-10 inches above the average high tide but was observed to be 18-20 inches above the average high tide. The unprecedented flooding resulted in a presentation to the City Commission at the November 3, 2015 Commission Conference Meeting. At that time, the Commission requested that the City revise the seawall ordinance (ULDR Sec. 47-19.3) to set a minimum seawall elevation requirement.

**3. Under what conditions would a property owner be required to raise their seawall to the new minimum height of 3.9 feet NAVD88?**

Under the proposed ordinance, a seawall what have to be raised if:

- a. The owner is installing a brand new seawall;
- b. The owner comes in for a repair permit and it is determined that the damage to the seawall triggers substantial repair threshold (at least 50% of the value or the structure must be repaired or replaced);
- c. The owner is cited for have a seawall in disrepair and it is determined that the damage to the seawall triggers substantial repair threshold;
- d. The owner is cited for allowing tidal waters entering their property to impact adjacent properties or a public right-of-way and the owner elects to install a new seawall or to raise their seawall to come into compliance.

**4. How did the City determine the minimum seawall elevation of 3.9 feet NAVD88?**

The proposed minimum elevation requirement (3.9 feet NAVD88) is equal to the previous maximum allowable seawall elevation in the existing ordinance. This proposed minimum elevation is adequate to address today's average high tide plus extreme height tides while still providing additional elevation for future sea level rise expected to occur within the 30-50 year lifespan of a seawall constructed today.

**5. What guidance for seawall elevations are other nearby municipalities using?**

Lighthouse Point- sets a maximum cap elevation of 6.5 ft NGVD (4.9 NAVD88)

Sea Ranch Lakes – No height adjustment allowed

Lauderdale by the Sea – Does not address height

Pompano - Seawalls will be erected to be consistent with the elevation of adjacent seawalls. No seawall will exceed 5 feet 10 inches NAVD88.

Hallandale – Does not set criteria for height

Miami Beach - 5.7 feet NAVD88 for all public seawalls and only those private seawalls which are part of a right-of-way project. The minimum for all other private seawalls is 4.0 feet NAVD designed to accommodate a future retrofit for a seawall height extension up to a minimum elevation of 5.7 NAVD.

Hillsborough Beach - Does not set criteria for height

**6. Can I just add a cap to my existing seawall to meet the elevation requirement when the time comes?**

That will depend on if the seawall is structurally sound and can bare the additional weight of the cap.

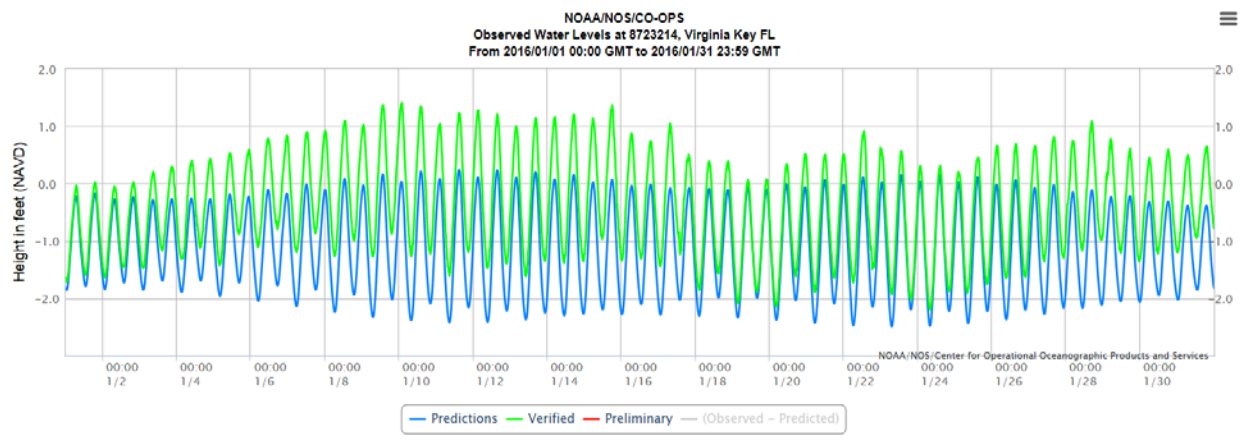
## 7. What is the substantial repair threshold?

If more than percent (50%) of a seawall or more than fifty percent (50%) of its replacement value is damaged, destroyed or removed for any reason, the entire seawall shall be required to meet the new elevation requirement.

## 8. Was the height of the September 2015 King Tide an anomaly? What causes the observed tide height to exceed the predicted tides?

As shown in the January 2016 graphic below from the Virginia Key Tide Gauge, the observed height of the tides continues to exceed the NOAA tide predictions (green line is higher than the blue line). While the difference between the predicted and observed tidal height varies, there is a continuing pattern that the observed heights are consistently higher by 6-12 inches. If this trend continues, King Tides this fall will again be in the 16-20 inches range above the average predicted high tide for the year.

Higher than predicted tides can be the result of a number of phenomena including, but not limited to, easterly winds, the passage of tropic storms and the slowing of the Gulf Stream Current. . Last fall, the slowing of the Gulf Stream resulted in a one foot rise in local sea level.



## 9. Why are we allowing a variety of seawall heights by setting a maximum and minimum?

The City previously set a maximum elevation which also allowed for varying heights. In the last few years, most new seawalls have been built to the previous maximum allowable elevation (3.9 feet NAVD88). Moving forward, new seawalls will be built to this same level reducing the amount of variability among seawalls. The minimum seawall elevation is based on the level of the sea and is set to address impacts coming from the ocean. The maximum elevation is based on the elevation of the property and is set to prevent rain water runoff from impacting the house.

Properties at different elevation require seawalls at different elevation to prevent erosion and

address drainage issues. Individuals with marine interests also consider seawall height in the context of access to their boats.

#### 10. Where do I find the supporting science for the sea wall height increase?

Extreme high tides occur every year in the fall. The tide elevation is an observed measurement. The sea level rise projection (see graphic) was updated in 2015 by a working group of scientists and sea level rise experts convened by the Southeast Florida Regional Climate Change Compact. The science of the projection can be found on the Compact website at <http://www.southeastfloridacclimatecompact.org/wp-content/uploads/2015/10/2015-Compact-Unified-Sea-Level-Rise-Projection.pdf>. The City Commission accepted the Updated Unified Regional Sea Level Rise Projection of the Southeast Florida Regional Climate Change Compact for purposes of sea level rise adaptation planning activities in December 15, 2015.

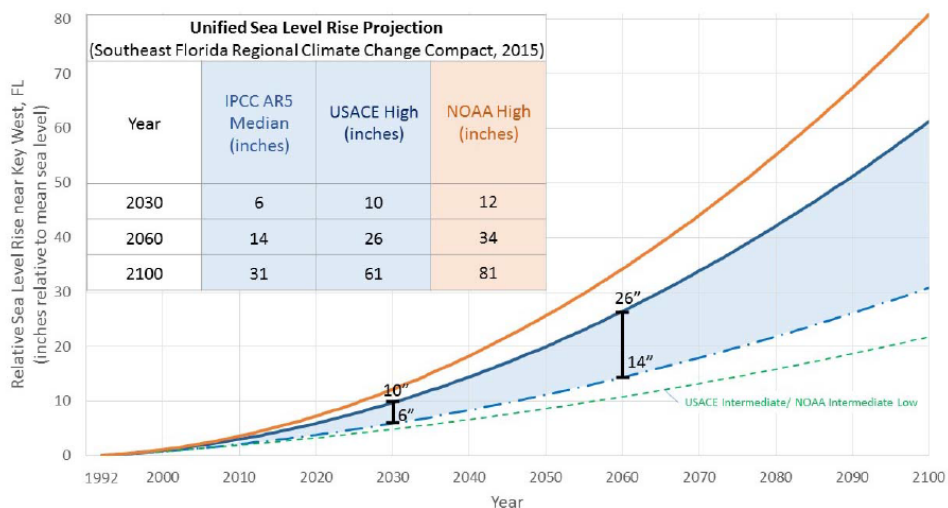


Figure 1: Unified Sea Level Rise Projection. These projections are referenced to mean sea level at the Key West tide gauge. The projection includes three global curves adapted for regional application: the median of the IPCC AR5 RCP8.5 scenario as the lowest boundary (blue dashed curve), the USACE High curve as the upper boundary for the short term for use until 2060 (solid blue line), and the NOAA High curve as the uppermost boundary for medium and long term use (orange solid curve). The incorporated table lists the projection values at years 2030, 2060 and 2100. The USACE Intermediate or NOAA Intermediate Low curve is displayed on the figure for reference (green dashed curve). This scenario would require significant reductions in greenhouse gas emissions in order to be plausible and does not reflect current emissions trends.

#### 11. What counts as a seawall? Are rip rap and coral rock seawalls included in the ordinance?

The ordinance defines a seawall as a vertical or near vertical structures placed between an upland area and a waterway. The seawall may be made of any material as long as it is substantially impermeable. Rip rap is defined in the proposed ordinance as a foundation of unconsolidated boulders, stone, concrete or similar materials placed on or near a shoreline to mitigate wave impacts and prevent erosion. For the purposes of Section 47-19.3(f), rip rap is not consider a seawall but traditional coral rock seawalls (coral boulders cemented into a solid wall) meet the definition.

The intent of adding the phrase “substantially impermeable” is to convey that tidal waters should not be able to move unimpeded through a seawall. This would include features such as open scuppers, cracks, seams, expansion joints, and poor mortar joints. Water will find its own level and penetrate under and through features until it reaches equilibrium. Seawalls shall be constructed so that tidal water should not “flow” inland through the above grade section of seawall. However, seawalls should be constructed with a means of relieving water pressure (hydrostatic pressure) from the upland side of the wall.

**12. Does the proposed ordinance address tidal flooding caused by a low seawall in the neighborhood?**

Yes. The proposed ordinance restricts property owners with seawalls below the minimum elevation from allowing tidal waters entering their property from impacting adjacent properties or public Rights-of-Way. If cited, those property owners have to pursue a remedy which may include installing a new seawall, raising the existing seawalls, or other solution.

**13. What happens if a property does not have a seawall and is causing neighborhood flooding?**

The proposed ordinance addresses waterway properties that may have permeable erosion barriers such as rip rap or a land/water interface of another nature which are allowing tidal waters entering their property to impact adjacent properties or public Rights-of-Way. If cited, those property owners have to pursue a remedy to prevent the tidal waters from leaving their properties which may include installing a new seawall, raising the existing seawalls, or other solution.

**14. Why is the Base Flood Elevation used to set the maximum elevation of the seawall?**

Base Flood Elevations are provided in the Federal Emergency Management Agency Flood Insurance Rate Maps (FEMA FIRM) as whole numbers (e.g. 4, 5, 6). This value was used to set a maximum to ensure that the new seawalls was lower than the finished flood elevation and would not result in grading of the property in a manner that would cause flooding into the home.

<u>Property's FEMA Flood Insurance Rate Map Location</u>	<u>Minimum Allowable Seawall Elevation</u>	<u>Maximum Allowable Seawall Elevation</u>
<u>In a floodplain with a base flood elevation greater than or equal to 5.0 feet NAVD88</u>	<u>3.9 feet NAVD88</u>	<u>Base Flood elevation of the property</u>
<u>In a floodplain with a base flood elevation equal to 4.0 feet NAVD88</u>	<u>3.9 feet NAVD88</u>	<u>5 feet NAVD88</u>
<u>In an X zone, not in a floodplain</u>	<u>3.9 feet NAVD88</u>	<u>Meet the definition of grade as determined by Section 47-2.2 (g)(1)(a)</u>



### 15. Will raising the seawalls worsen flooding caused by stormwater events?

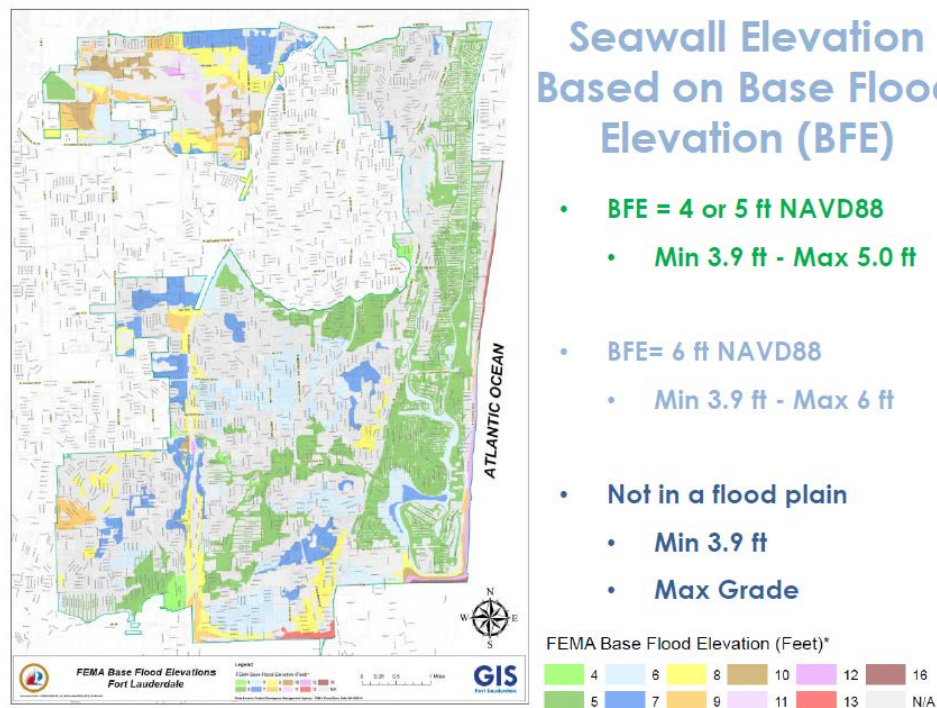
The elevated seawalls could prevent overland flow of stormwater. Generally speaking, the City's stormwater management system (drainage infrastructure) is designed to prevent overland flow. One way valves incorporated into the seawall itself is one potential solution to concerns of water pooling on the upland side of a seawall.

Please note that this proposed seawall ordinance is one component of an overarching strategy to improve the resiliency of our community to stormwater and tidal flooding. Other efforts being implemented through the City's Stormwater Master Plan, Seawall Master Plan, and Canal Dredging Master Plan will further reduce flooding and complement the seawall ordinance implementation. While elevation of the roadways is another potential tool to address flooding, finished floor elevations for the existing buildings need to be considered which limits the locations where street elevations could be applied.

### 16. I just put in a new seawall at the current maximum elevation of 3.9 NAVD88 (5.5 NGVD29). Do I need to do anything related to the proposed recommendation to design with a stronger foundation?

No. Your seawall met the requirement when it was installed.

### 17. What is my Base Flood Elevation and what are the applicable minimum and maximum seawall elevation?



**18. What if my finished floor is below 3.9 feet NAVD and I have to raise my seawall?**

Waterfront properties with a habitable finished floor elevation of less than 3.9 feet NAVD88 have site conditions which may not be able to accommodate raising their seawall to the minimum required elevations. For this reason, the ordinance contains a provision which will allow some flexibility for a seawall to be constructed at less than the stated minimum elevation if a waiver is granted by the City Engineer.

**19. Will the City canal dredging project impact the soundness of existing seawalls?  
Should the ordinance indicate building seawalls deeper?**

The City only dredges the center third of a canal, ensuring it does not dredge within 10 feet of a seawall to ensure it does not negatively impact seawalls. City canal dredging projects will not impact the foundation of existing seawalls. The City canal dredging criteria requires the contractor(s) to maintain all dredging operations 10 feet away from any seawall to prevent any impact to the soils surrounding the seawalls. Dredging activities would not warrant setting seawalls deeper.

**20. Will the ordinance make permitting easier?**

The ordinance does not change the current permitting process. However, the City is currently considering creating standard seawall designs that may be expedited through permitting.

**21. Where are the funds going to come from to address repairs of the City owned seawalls? How many linear feet of seawall does the City own?**

Should the proposed ordinance be adopted, the City will need to address our own seawalls in a phased manner as flooding conditions change with time and sea level rise. To incrementally address funding, design and construction of publically-owned seawalls, a variety of funding options could be considered including existing community investment plan funding, special assessments, a community development district, a seawall utility, future FEMA mitigation funds, a bond measure or increased millage rate on ad valorem property tax.

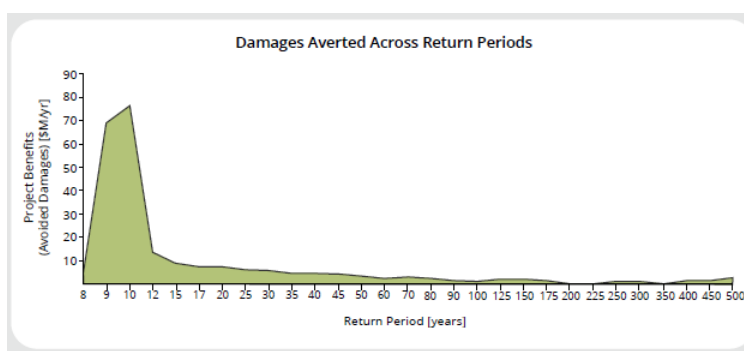
We estimate that the City owns four (4) miles of seawall (~21,000 linear feet). Depending on whether the seawall needs to be raised or replaced the cost in today's dollars could range from \$2M-\$26M

**22. What evidence is there to support raising seawalls will reduce the risk of flooding?**

In neighborhoods where tidal flooding into the roadway is observed to be caused by ocean water flowing over a low lying seawall, common sense dictates that raising that seawall can be one tool in reducing local flooding.

The Rockefeller Foundation partnered with the re-insurance industry to conduct a study to

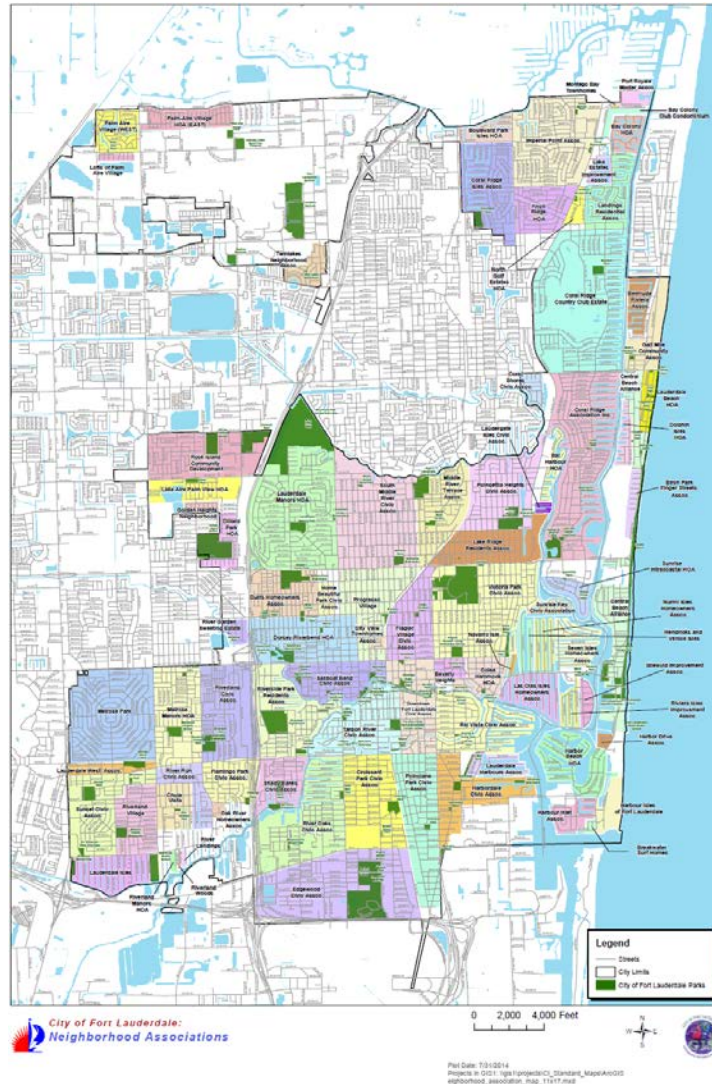
determine the benefits of investing in resilience. The report entitled “[Leveraging Catastrophe Bonds as a Mechanism for Resilient Infrastructure Project Finance](#)” was released in December 2015. One of the case studies reviewed was the impact of raising seawalls on Miami Beach. The study concluded “Preliminary results on risk reductions indicate that seawall upgrades that raise the seawall cap minimum elevation from 3.2 feet NAVD88 to 5.7 feet NAVD88 can provide significant benefits, particularly in reducing loss from frequent, low intensity surge events.” The graphic below shows that investing in resilient infrastructure, such as the seawalls in Miami Beach, can dramatically reduce economic losses.



### 23. What neighborhoods have seawalls?

As the Venice of America, Fort Lauderdale has waterside communities throughout the city, not just on the ocean and the Intracoastal Waterway. Nearly every canal, river and water body that runs through the City (Intracoastal Waterway, New River, Tarpon River, Middle River) is connected directly to the oceans and therefore impacted by sea level rise and potentially by seasonal extreme high tides. Neighborhoods as far west as Lauderdale Isles, in the center of the City like Sail Boat Bend, and to the north like Coral Ridge Isles have seawalls. The number of recognized Neighborhood Associations that are not on a water body is dwarfed by the number of Association that border one (see the map).





## 24. Will the seawalls help with impacts from tropical storms and hurricane like storm surge?

A new seawall built to the proposed standard will provide some protection from storm surge. However, the ordinance was developed to address tidal flooding events that occur seasonally, especially in the fall. These are high frequency chronic events. By trying to design an ordinance to address catastrophic low frequency events like hurricanes, we would be armoring the city with very high seawalls creating concrete passageways out of our current scenic waterways.

## 25. What is the cost of seawall replacement or repair?

Seawall contractors were contacted to better understand the range of charges for installing a seawall. They quoted \$650-\$2000 per linear foot depending on the depth of the waterway and location of the seawall. Engineering and permitting services were \$2000-\$5000 per job. Repair of broken/spalled concrete areas in the cap \$60 per cubic foot of epoxy mortar. To add a 12”

cap to an existing seawall is estimated at \$75 - \$125 per linear foot.

Most homeowners have an expectation that they will need to maintain and, at some point, replace their roof. Maintaining and, when appropriate, replacing their seawall should be a consideration for all waterfront property owners as well. The City is currently investing substantial dollars to reduce tidal and stormwater flooding. Homeowner, likewise, need to invest in their own property improvements to address these same concerns.

**26. Does the city, county, state or federal government offer funding for private property owners to repair their seawalls?**

Not currently. The Federal Emergency Management Agency is considering funding raising seawalls as a form of hazard mitigation.

**27. How do we find out what the height our sea walls?**

If the sea wall was recently built, you may be able to request property records in person at the Department of Sustainable Development at 700 NW 19th Avenue, 33311. The elevation of the seawall will be on the plan. If it is an older existing seawall, you would need a property survey to determine the height of your seawall. If you have a survey of your property, the height of the sea wall is likely to appear on the survey. Look at the units on the survey. The proposed minimum seawall elevation requirements are: 3.9 ft NAVD88 (5.5 ft NGVD29). If your survey does not have the elevation of the seawall but does include your finished floor elevation, you can estimate the height of your seawall by running a level string line from your finished floor to your seawall and measure the difference. The current height of the seawall, its condition, and its structural design will determine how this proposed ordinance will affect any given property.

**28. How will the city code officers enforce the requirement to keep seawalls in good repair?**

In many ways, a seawall is not different than any other structural component of a property like the roof or a fence. It requires maintenance and eventual replacement. The proposed ordinance requires that seawalls are maintained in good repair. A seawall is presumed to be in disrepair if it allows for upland erosion, transfer of material through the seawall or allows tidal waters to flow unimpeded through the seawall to adjacent properties or public Right-of-Ways such as roads. The “good repair” criterion does not apply to the height of existing seawalls.

Most of the City’s code enforcement is complaint driven, a direct result of the observation of one of our code enforcement officers, or associated with targeted sweeps for specific concerns. Areas known for tidal flooding are likely locations for initial enforcement of the “maintained in good repair” criterion.

**29. I don’t want to tattle on my neighbor. Can’t the City just review all the seawalls?**

We all have a role to play in building this community. The City has limited Code Enforcement officers and this is just one of the many codes they are responsible for enforcing. Our neighbors

are the City's eyes and ears. You let us know where the problems are. Some have expressed the concern that complaining on their neighbors is detrimental to neighborhood harmony. However, a property owner who is not maintaining their seawall and/or allowing tidal waters to flood roadways, limiting access to a neighbor's home and potentially impacting neighborhood property values also needs to be a good neighbor.

**30. What are the consequences for not complying following citation for a seawall in disrepair?**

If the property owner maintained contact with the code officer, the code officer often provides the property owner with reasonable extension of time to comply. However, if the property owner still does not cure the violation, then the cases are taken to the special magistrate for adjudication. The special magistrate order will grant the property owner the numbers of days to comply and a daily fine if compliance is not achieved within the ordered timeframe. If the property owner meets the compliance timeframe, then the case is presented to the special magistrate to either abate any fines that may have accrued before the imposition hearing. A lien is placed on the property if the property continues to remain out of compliance. The City cannot foreclose on a lien on homesteaded property.

The City may in the public interest complete the work when the property owner does not comply with the order. In those cases the property owner would be "liened" for those costs and the costs may be placed as a non-ad valorem assessment in the property tax roll.

**31. What Does the City assume any responsibility for seawall maintenance/repairs when public infrastructure (such as an outfall pipe) passes through a privately owned wall?**

City infrastructure penetrating a private seawall serves a public benefit usually tied directly to the neighborhood in which the property is located. The City is responsible for maintaining its infrastructure. On a case by case basis, property owners should work with the City if there are concerns with the repair or maintenance of City assets that may have an impact on the private seawall.

**32. Property owners have received special permission to place a dock or other amenity to a public seawall. What happens to that amenity when the City raises the seawall elevation?**

Section 8-144 of the Unified Land Development Code gives the City Commission the ability to permit private use of public property abutting a waterway by resolution. However, this is just for the use of the public waterway. The specific resolution (permit) and the general provisions in this section define the relationship between the City and private property owner. These permits are generally temporary in nature. Those that include a fixed period of time may require that the permit holder repair, replace or maintain the adjacent seawall during the term of the permit. Should the City elevate a seawall, the permit holder would be required to remove any nonfixture improvements placed by him upon public lands and make the necessary repairs to the city

property to place the same in good condition.

### **33. Will putting in a new seawall impact my property assessment?**

According to the Broward County Property Appraiser's Director of Residential Property Department), the seawalls are already included in the land value and therefore modification would not affect the assessment. This is in contrast to a new roof in which modifications may affect the market value. However, based on the Property Appraiser's point system, a new roof would have a minimal impact on the assessment.

### **34. How are fixed and floating docks impacted by the ordinance?**

The proposed ordinance allows fixed docks to be built lower than the adjacent seawall. There is no minimum height for a dock. Docks tied to a seawall have a maximum height of no more than ten inches higher than the seawall to which they are attached.

Floating docks are allowed but must be permitted and permanently attached to a marginal dock, finger pier, mooring pilings, or seawall.

### **35. When are the scheduled public meetings on the proposed ordinance?**

April 7	Marine Advisory Board ( <b>Complete</b> )
April 25	Council of Civic Association Executive Board ( <b>Complete</b> )
May 3	City Commission Conference ( <b>Complete</b> )
May 5	Marine Advisory Board ( <b>Complete</b> )
May 9	District 1 District wide meeting on the Proposed Seawall Ordinance ( <b>Complete</b> )
May 10	Council of Civic Association Regular Meeting ( <b>Complete</b> )
May 18	Planning and Zoning Board – Public Hearing ( <b>Complete</b> – <b>Ordinance recommended to the City Commission for adoption</b> )
May 23	Sustainability Advisory Board
June 7	First Public Reading – City Commission
June 21	Second Public Reading – City Commission