Frequently Asked Questions

1. *What are the components of the flood waters affecting the Savannah area from hurricanes approaching the island from the south?*

   The total water level at the shoreline due to the passage of a hurricane arises from Storm Surge; Wave Set Up; and High Tide. Storm surge is the increase in sea level resulting from the direct action of the wind and atmospheric pressure associated with the hurricane, while wave setup is an overall increase in sea level due to wave breaking. In the Savannah Area, the height of both storm surge and wave set up is limited due to the deep water in front of the ironshore bluff. The water in this area is 30 to 50 feet deep. The primary cause of flooding is wave overtopping of the bluff.

2. *What about spray? How much does that affect the flood waters?*

   Although spray overtopping is a very noticeable effect during storms, technical studies have shown that the spray contributes very little to the overall volume of water. As a result, equations for estimation of overtopping do not include the often-negligible volume of water from spray.

3. *How effective is the wall likely to be?*

   Using information recorded during Hurricane Wilma, the flood volume was calculated to be approximately 1.6 billion gallons of water. If the proposed wall with +19 ft elevation is put in place, our estimate for total overtopping volume for Hurricane Wilma is 22 million gallons. In other words, if a wall had been in place, it would have prevented 98-99% of the flood waters from reaching in-land.

4. *How did you determine how much water will get over the wall?*

   Overtopping rates are estimated on the basis of empirical equations that have been calibrated against the results of physical model tests. The topography at the Savannah Gully site is complex and the development of overtopping estimates by means of the empirical equations is subject to some uncertainty, hence the range of values in our estimates.

In order to most accurately predict the action of the wall during a hurricane event, we recommend the construction of a physical tank model to test the structure and to conduct a drainage analysis.

5. *Why not consider a large drainage channel or moat dug into the ground along the projected line of the wall?*

There are a few concerns with the construction of a channel or moat. Chiefly, the concerns include the following:

- A channel would actually increase wave run up.
- The geological formations in the area are dolostone and limestone, which can contain openings ranging, in size from cracks to sea caves.
- The irregular surface will require deep excavation to maintain depth
- Existing cracks and openings will enlarge over time.
- Soft or weak rock in the sidewalls or bottom will erode.
- The moat prism will be difficult to maintain.

6. How can an event be a CAT 5 near the eye but a CAT 2 or 3 on-island?

Hurricane wind speeds are highest in a location that is typically in the order of 10 to 30 miles from the hurricane eye, and it is these winds that are the basis of the hurricane categorization. Hurricane wind speeds and wind-induced wave conditions diminish with distance from the hurricane.

7. How effective is the proposed design against a CAT 3 hurricane?

The floodwall as currently designed would be greater than 90% effective for a CAT 3 hurricane approaching Grand Cayman from the south.

8. How much seawater (volume) flooded the area due to Wilma?

It is estimated that approximately 1.6 billion gallons of seawater flooded the Savannah Area during Hurricane Wilma.

9. *Can you store the water in the gully and pump it back to the sea into the south sound?*

No, in order to store vast quantities of water in the gully, it would need to be excavated and a retaining wall would need to be constructed around the perimeter. The gully would need to be excavated over 12,000 feet to contain the volume of water from a storm like Wilma.

10. *Why don't you construct a conveyance system to allow the flood waters to flow into the Pedro Castle Quarry located one mile east of the gully area?*

To convey the water to Pedro Quarry would require using the gully as a collection basin and then building a one mile long pipe system to carry the water to the quarry. The pipe would need to be in excess of 30' in diameter to carry the 1600 million gallons of water. At the quarry, there would need to be additional excavation to make the quarry almost twice as large and 175 feet deep.

11. *How much water to you expect to go over the wall during a CAT 2 hurricane?*

It is estimated that the floodwall as currently designed would prevent approximately 96-99% of the water from overtopping the wall for a CAT 2 event. The remaining 1-4% would be approximately 22-64 million gallons of water.

12. *Won't the water simply flow along the wall and then go around the ends of the wall and flood areas not previously flooded.*

No, the wall is designed to match the current high points along the ironshore, which have not historically experienced flooding, and the low spots are blocked by wall.

13. *Won't the volume of water flowing along the wall be higher that existing conditions because it has nowhere to go and won't the higher volumes create flooding in areas previously protected by their higher elevation?*

No, the wall is designed to match the current high points along the ironshore and the low spots are blocked by wall. The water overtopping the edge of the ironshore bluff will flow back to sea, as it currently does at locations with higher elevations east and west of the ironshore.

14. *What will happen to the water on the land side of the wall?*

Of the 22-48 million gallons of water that overtop the wall, it is anticipated that some water will still cross Sandy Ground Road and flow through the gully. This flooding will be far less significant that current flooding (measures in inches rather than feet). As some water may pond behind the wall, the wall will be constructed with one way check valves that will allow the water to flow back to the ocean after the storm.

15. *If the intersection of Shamrock and Homestead Crescent were raised and a culvert was installed below the roads, the waters will not block the road and emergency vehicles will be able to cross.*

If the roads were raised, culverts would be needed at several places along Shamrock Road to handle the flooding and the road would need to be raised up for approximately 3000 feet affecting 40 or so properties. While this alternative would allow the main roads to remain open, it would not limit the depth of flooding and would increase the flooding on the south side of Shamrock Road.

16. *Who is going to benefit from the wall? Why protect one or two homes?*

The wall is designed to prevent 95-98% of the floodwaters from reaching inland. The Savannah Acres, Savannah Meadows, Butterfly Circle are among the communities to benefit from the flood wall. In addition, the businesses along Shamrock and Homestead Circle will also benefit from the wall.

17. *Have you considered transverse drainage sluices to allow the water to flow back to the sea rather than construct the wall?*

Transverse drainage sluices or channels dug into the ironshore will allow the water to run up inland much quicker than under current conditions by providing a deep, smooth channel. This will exacerbate the flooding, not reduce it.

18. *Why is this wall so big and so expensive?*

Although the proposed wall is almost 2000 feet long the proposed wall height is not very large as it ranges from 2 to 7 feet above the surface of the ground. The design of this wall is different from some of the other walls on the island. For example, the East End Seawall has a roadbed "back-up" which together with the wall, share the resistance of the waves. For the Savannah wall, the foundation and the wall must bear all the resistance of the waves.