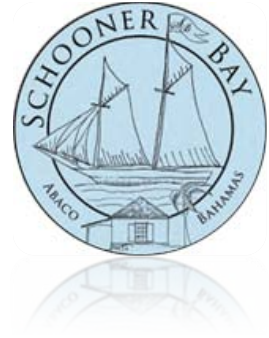


STORM SURGE DESIGN



The factors that protect the harbor at Schooner Bay from **wave action** are:

- The headland of Winding Bay /Cherokee which create a lee for the bay of Schooner Bay from the NE.
- The iron shore protects from the E/SE.
- The 60 foot ridge protects from the West.
- The offshore reef system protects from due East
- The Coppice is proof that over one hundred years no significant event has breached the dune.
- The vegetation on the iron shore gives an indication of the reach of storm weather.
- The dune itself is a signature of long term wave action.
- At the harbor mouth the dune is low and in the middle about ½ mile north and on it is 15 feet higher.
- This confirms historical direction of wave action away from the harbor mouth.
- Wave cannot exceed the depth of water they are in. In fact they are probably limited to a height around ½ the depth. So the offshore approaches at 15 feet depth will support 7 foot waves etc.
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In addition to wave height we have to look at additional **storm surge**:

- Storm surges vary in height according to depth of Ocean and funneling effects. For example The Current at Eleuthera will have a higher surge as the water funnels through the cut and level rises.
- Shallow water on a bank will surge much higher than deep water in the Ocean. That is because the surge is similar to a bow wave of a ship and pushes in from of the storm direction. In deep water the piling-up effect is offset by the water sinking down into the ocean depths. On a bank the water cannot go down so it steps up in front of the storm. Deep ocean water will only have a surge equal to the surge plus wave height. The maximum surge effect is about 6 feet in deep Ocean according to NOAA. On a bank it can be over 30 feet. In a cut in Exuma years ago Hurricane George produced a localized surge of 17 feet. So at Schooner we have to design with sea level rise not battering waves. The harbor edge is designed to dissipate wave echo for smaller wind waves that may develop in the harbor. The tidal surge we expect in a Category 5 Hurricane at High Tide is 10 feet. The minimum finished floor elevation is 12 feet. In addition all structures at Schooner are built to Fortified Home standards. That means the entire floor can go underwater and survive the event.
- A 10 foot surge would raise the harbour level and meet the same level for the south and then stabilize. Open areas are planned in the village harbour area to handle any such event.

Rainfall:

- The village grade is being raised so that the back of the village is at 20 feet. That means we will not have **rain flooding** as the positive drainage will remove all surface rainwater during any severe weather event.