

ATTACHMENT A

Strategies and Mitigation of Flood Waters of the Cape Fear River

While there are a multitude of strategies and design, both active and passive, for dealing with potential raising river levels two issues drive the strategy adopted for The Villages at Battleship Pointe. These issues are first the rate of occurrence and second the amount or level of the event. The Villages location at the confluence of both the Cape Fear and Northeast Cape Fear will inevitably experience both minor rising river levels from lunar high tides and minor storm events and while less frequent rising river levels due to major storms that frequent the area. This simple fact causes concern for any development on the riverfront and a design strategy must be adopted to mitigate the effects of any event. The site topography, as a first step, must be considered as part of the overall mitigation design. The current site sits approximately 9' above sea level, we due to the environmental contamination on the site, are estimating adding another 2' of fill as part of the Brownfield cleanup process. This will provide a base elevation of approximately 11' above sea level. The next decision point in any design approach is the type of flood control system best suited to this particular site for this development. The approach we have embraced is considered passive, meaning a natural non mechanical systematic philosophy for dealing with the potential flood waters. This systematic approach must be designed into the project from the initial conceptual thought process to the final utilization, grading and landscaping, of the site. The design we have chosen is considered the oldest, simplest and most reliable design that has been proven over multiple centuries worldwide. The major component of this approach is to provide paths for the flood waters to invade the site and transect the site without creating any damage to the physical site components. We can look to examples of this philosophy within our own county that successfully have been employed to focus any flood waters and allow its unrestricted flow for those waters to transect the property without creating major destruction. The area of Blue Clay Rd and Old Dairy Rd currently has a federally documented spillway or flood channel that has for decades successfully prevented and major flooding in the area. We can also look on a more macro scale at cities such as Phoenix, Los Angeles, and San Diego for examples of a comprehensive successful static flood mitigation designs. These systems require little to no maintenance are not objectionable or unsightly to the community and effectively prevent the occurrence of any major damage to the properties they have been designed to protect. The Villages project has been designed around the central principle that by allowing, then directing any potential flood waters though the site, the amount of damage to the project can be easily controlled. Historically this particular property has not experienced any major flooding over the last 4 to 5 decades according to the patriarch of the family that has owned it during that time. Additionally, we have documented fact that the highest flood level recorded to date by, NOAA is 9.03 feet on 8/4/2020. This level was recorded at a NOAA station located approximately ½ mile down stream on the west shore of the Cape Fear River. This along with the NOAA, Advanced Hydrologic Prediction teams anticipated 3.85 foot increase in Cape Fear River rise in river level by 2050 supports that the effect of flooding either major or minor on this site is minimal at best. The design team however has

taken the further step of designing a multifunctional pedestal type support system for the actual pedestrian area of the site that can not only sacrifice up to 10' of additional elevation available for accommodating any river level rise and minor flood event without impact to the occupied area of the site but in the event of a catastrophic flood event an additional 25 feet of elevation is available to protect the physical site and its occupants. Further, currently Point Harbor Road the major ingress and egress avenue into the site historically experiences water coverage at approximately 6.5 feet of river level rise. The developers have been granted control of a major section of Point Harbor Rd by NCDOT and as part of the encroachment agreement calling for roadway improvements and resign, plan to raise the roadway by an additional 3.5 feet.