Section 9 - Flood Elevation Requirements

A. Introduction - Localities in Hampton Roads have adopted freeboard construction requirements above specific FEMA flood plain mapping that impact proposed construction standards in these localities, including HRSD projects. To comply with the Locality requirements and to consider Sea Level Rise, this standard will cover the process to determine the finished floor elevation for HRSD constructed projects.

B. Definitions

- Freeboard - finished floor height above FEMA Base Flood Elevation for the 100-year storm
- BFE - Base Flood Elevation
- FIRM - Flood Insurance Rate Map
- Flood Zones:

AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
Coastal A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
VE	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

C. Locality Code Requirements - The following table summarizes the current adopted freeboard construction requirement for localities in Hampton Roads and the HRSD service area.

Locality	AO Zone Min Elev	Coastal A or AE Zone Min Elev	VE or V Zone Min Elev
Chesapeake	Equal to FIRM or flood-proofed	Base flood + 1.5'	Base flood + 1.5'
Isle of Wight	---	Base flood + 1.5'	Base flood + 1.5'

Norfolk	Equal to FIRM or flood-proofed	Base flood + 3'	Base flood + 3'
Portsmouth	Equal to FIRM or 2' higher than adjacent grade if no elev available	Base flood + 3'	Base flood + 3'
Smithfield	---	---	---
Suffolk	Equal to FIRM or 2' higher than adjacent grade if no elev available	Base flood + 1'	Base flood + 1'
Virginia Beach	Equal to FIRM or 2' higher than adjacent grade if no elev available	Base flood + 2'	Base flood + 2'
Gloucester	Base flood + 2'	Base flood + 2'	Base flood + 2'
Hampton	---	Base flood + 3'	Base flood + 3'
James City County	FIRM + 2'	Base flood + 2'	Base flood + 2'
Mathews	Equal to FIRM	Base flood + 1'	Base flood + 1'
Newport News	Equal to FIRM or 2' higher than adjacent grade if no elev available	Base flood + 2'	Base flood + 2'
Poquoson	Base flood + 3'	Base flood + 3'	Base flood + 3'
Williamsburg	N/A	N/A	Base flood + 1.5'
York	FIRM + 3' or 2' higher than adjacent grade if no elev available	Base flood + 3'	Base flood + 3'
King William	---	Base flood + 1'	Base flood + 1'
West Point	---	Base flood + 1'	Base flood + 1'

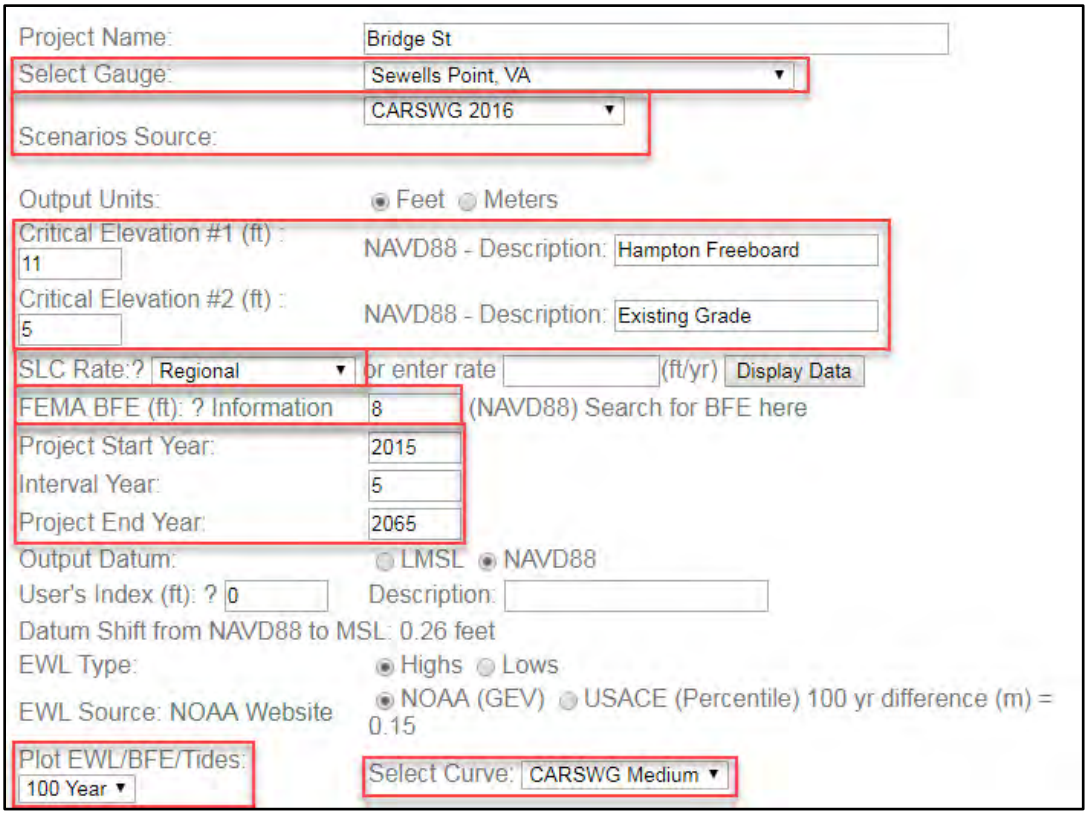
These freeboard finished floor elevation requirements should be verified with the locality in question for each project when initiated. Localized drainage constraints should also be considered for each project when setting the elevation for new buildings or structures.

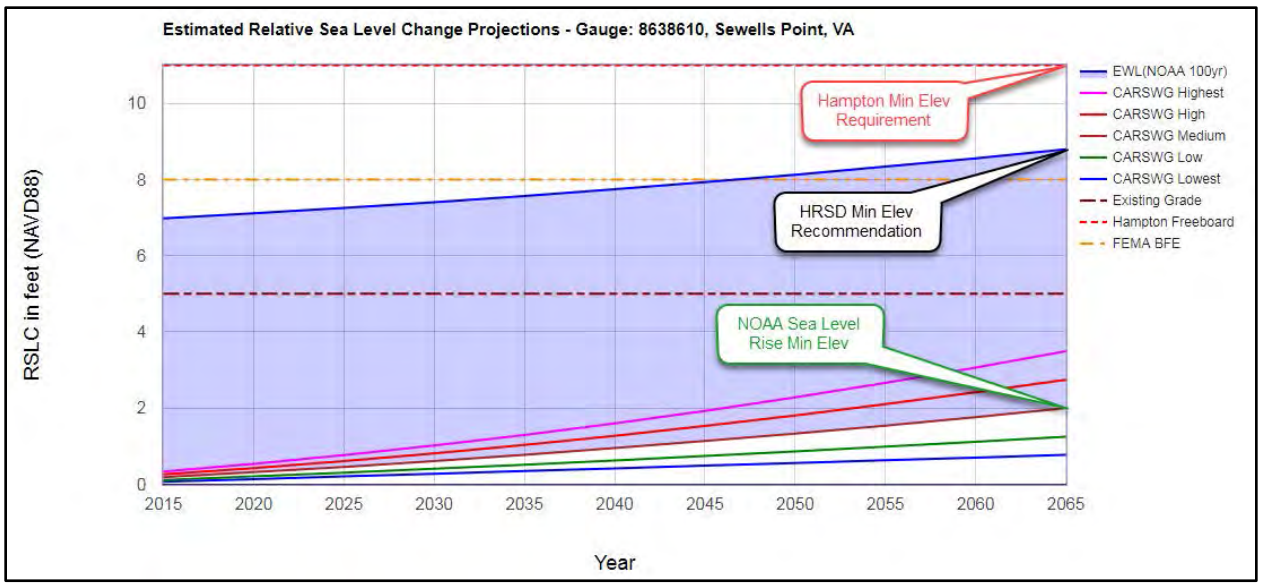
D. Steps for Determining Construction Elevation - The following tools and procedure should be used with all HRSD above ground construction to determine finished floor elevation:

1. US Army Corps Sea-Level Change Curve Calculator (http://corpsmapu.usace.army.mil/rccinfo/slc/slcc_calc.html)
2. Select Sewell's Point gauge
3. Select CARSWG 2016 under Scenario Source
4. Input Locality Freeboard elevation under Critical Elevation #1
5. Input existing grade elevation under Critical Elevation #2
6. SLC Rate should be set to Regional
7. Input FEMA BFE (site specific)

8. Input project start and end years (50-yr life cycle)
    - Assume project start year is when the facility will come on-line
9. Under the Plot EWL/BFE/Tides section select 100-yr
10. Select CARSWG Medium curve
11. Select finished floor elevation from graph from the greater of the set of results, see example below

E. Elevation Requirement Example - The following example is based upon HRSD's Bridge Street Pump Station project located in Hampton.





End of Section