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Town Planner's Review
Wednesday, February 28, 2018

- XI. **Amendments to Flood Hazard Overlay District.** Proposed amendments to zoning ordinance to require two feet of freeboard above the base flood elevation, to recommend (but not require) compliance with the standards of the overlay district for areas that are outside of the flood hazard area but within an advisory climate change risk area, and to make other minor changes.
- I recommend discussion on the proposed amendments and if acceptable, setting a public hearing for March 14.

Please note the following:

- 1) **Background.** At the recommendation of Strafford Regional Planning Commission (SRPC) the staff has worked with James Burdin to make two changes to Durham's Flood Hazard Overlay District regarding adding two feet of freeboard and recommending compliance based on the advisory climate change map. The proposal was presented to the Leadership Committee (department heads) and the details were worked out by James, Audrey Cline, and Michael Behrendt with input from Jennifer Gilbert, Floodplain Management Program Coordinator for the NH Office of Strategic Initiatives. James will attend the Planning Board meeting to explain the proposed amendments.
- 2) **Vulnerability assessment.** With the assistance of SRPC, the Town completed a vulnerability assessment in February 2017. It was also included as an appendix to the Hazard Mitigation Plan alongside the 2013 climate adaptation chapter. This document identified the risk areas associated with the three different sea-level rise scenarios, below. It is posted to the website.
- 3) **Freeboard.** Presently, our ordinance requires that construction within the 100 year flood zone have the lowest floor of the building be raised to the base flood elevation (BFE). The amendment would require that the building now be raised two feet above the BFE.
- 4) **Basement.** Reference to "basement" is deleted in several places as "lowest floor" includes the basement in the definitions section of the Zoning Ordinance.
- 5) **Rationale – Hazards Report.** The figure of two feet of freeboard comes from the Coastal Risk and Hazards Report, which was the final document prepared by the NH Coastal Risk and Hazards Commission. The Commission was established in 2013 and consisted of various state and local officials, including a representative from each of the 17

coastal municipalities. The two feet of freeboard comes from this excerpt from the document:

- c. Encourage municipalities to use one of the following three approaches^{xiii,xiv,xv} for determining a higher vertical flood elevation and expanded corresponding horizontal floodplain than the current base flood elevation and floodplain to address current and future flood risk for new construction, substantial improvement, or repairs to substantially-damaged municipal and private structures and facilities:
 - i. *Climate-informed Science Approach* – use the best available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science.^{xvi}
 - ii. **Freeboard** *Value Approach* – use the freeboard value, reached by adding an additional two (2) feet to the base flood elevation for non-critical structures and facilities and from adding an additional three (3) feet to the base flood elevation for critical^{xvii} structures and facilities.
 - iii. *The 0.2-percent-annual-chance Flood Approach* – use the 0.2-percent-annual-chance flood elevation (also known as the 500-year flood elevation).

- 6) Rationale – ASFM. A brochure called, “The Costs and Benefits of Building Higher” produced by the Association of State Floodplain Managers states:

Communities that participate in the National Flood Insurance Program must ensure all new residential buildings constructed in the floodplain are elevated to or above the base flood elevation (BFE). The base flood is the flood that has a 1% chance of occurring or being exceeded in any given year.

Many communities concluded the BFE is not a sufficient level of protection, saying:

- *Floods higher than the base flood can and do occur.*
- *Most flood studies do not account for debris or obstructions during the base flood, thereby underestimating the BFE.*
- *NFIP flood studies do not account for the impacts of future development or sea level rise. Over time, the regulatory standard does not keep up with increases in flood elevations.*
- *In non-coastal areas, the protection level is measured at the top of the lowest floor, leaving the flooring, subfloor and floor joists exposed to the base flood.*

To offset these shortcomings of building only to the BFE, over half of the communities in the country require new buildings to be protected to one or more feet higher than the BFE. Floodplain managers call this “freeboard.”

...While the BFE is the minimum standard for communities in the NFIP, the program encourages regulations that set a higher protection level...

Lower insurance premiums are an immediate benefit to the property owner. Other benefits include less flood damage in the community, less suffering, less business interruption, quicker recovery, and higher property values.

The brochure estimates a payback period of 3.3 years on the additional cost for adding two feet of freeboard based on the lower insurance premiums for a 2,000 square foot stem wall (a particular type of foundation) house.

- 7) Advisory Climate Change. The second proposal affects a relatively small number of properties which are not included in the flood hazard area (and thus are not subject to the requirements of the ordinance) but which would be impacted by projected sea level rise and storm surge. The amendment would recommend (but not require) that those property owners meet the standards of the Flood Hazard Overlay District.
- 8) Maps. Four maps are included: 1) The Advisory Climate Change Risk Area map which shows the areas that would be affected by climate change and storm surge. These are shown in red. Note that most of these lands are included in the flood hazard area. 2) Sea Level Rise with Storm Surge for three potential future scenarios – low-level rise, moderate-level rise, and high-level rise. On these maps the green area is the flood hazard area and the red cross hatch area is the area affected by sea level rise and storm surge. *The advisory climate change amendment would apply to those areas that are shown with a red cross hatch just beyond the green areas (not in green)*. This affected area is larger as one moves from the low-level rise to the high-level rise. The Advisory Climate Change Risk Area map included here shows the moderate-level rise. If the Planning Board wishes to include this amendment it could specify use of any of the three levels. Note that the Leadership Committee recommended use of the moderate-level rise. I would recommend that the board consider use of the high-level rise because: a) this provision would be voluntary; b) the Leadership Committee did not have an opportunity to see the three maps which show very limited areas that would be affected.
- 9) Other changes. There are some other minor changes included in the amendments as marked.