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February 16, 2021

Christian Klein, Chair
Zoning Board of Appeals
Town of Arlington
Arlington, MA 02476

RE: Arlington Land Trust – Weston & Sampson Resiliency Review

Dear Chairman Klein:

BSC Group is in receipt of the resiliency review related to the East Arlington Mugar site (Thorndike Place) conducted by Weston & Sampson, dated January 20, 2021, on behalf of the Arlington Land Trust. BSC has reviewed the Weston & Sampson memorandum and offers the following responses and clarifications related to the information presented. The memorandum section headings are included for ease of review.

Background

History

- Weston & Sampson states that the Site is located within a protected wetland in both a FEMA established 100-year floodplain and 500- year floodplain. This statement is only partially accurate. Much of the 17.5-acre site contains regulated wetlands and 100-year floodplain. However, the portion of the Site proposed for development is located entirely outside of wetlands and includes only minimal impacts to 100-year floodplain.
- Weston & Sampson also states that the Applicant is utilizing the Chapter 40B statute to seek to bypass the protected wetlands zoning regulations by providing a certain percentage of affordable housing in the Thorndike Place development. This statement is not accurate. Under Chapter 40B, the Applicant is required to meet the requirements of the Wetlands Protection Act, as a minimum, but as part of the Thorndike Place proposal, the Applicant proposes to meet not only the requirements of the Wetlands Protection Act but also the setback and compensatory storage requirements of the Town of Arlington Wetland Protection Regulations (2015). Again, no structure is proposed within the wetlands.
- Figures 1 through 7 of the Weston & Sampson memorandum depict scenes after previous storm events. It is important to note that the figures primarily depict locations east of the Minuteman Bikeway, adjacent to Alewife Brook, located within the FEMA Floodway and at elevations approximately 3 – 5 feet lower than the area of the Site proposed for development. These Figures are not representative of the area of the Site proposed for development.

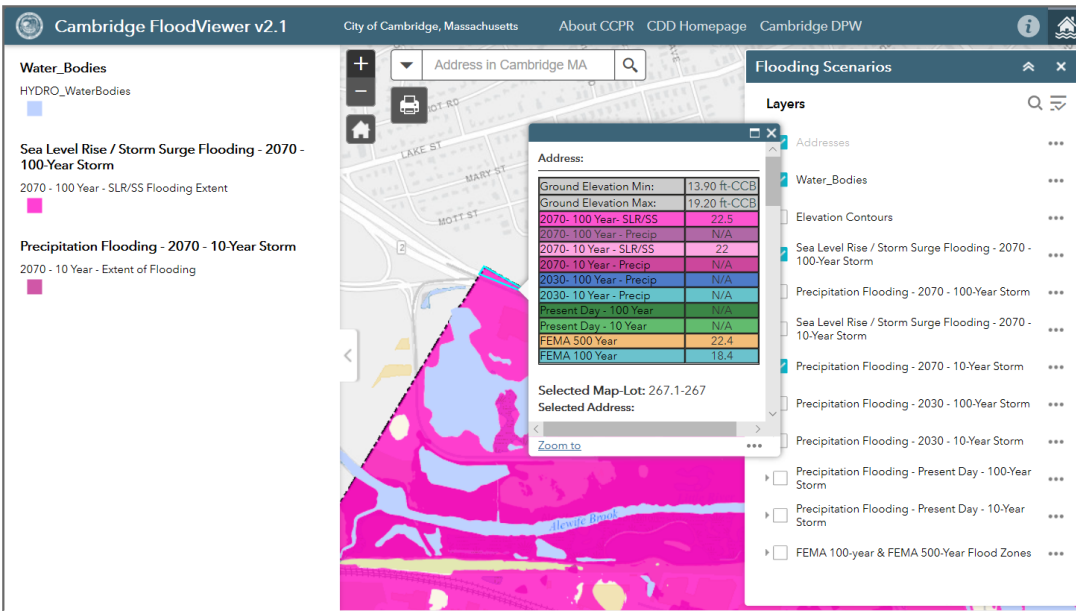


Current Design

- Weston & Sampson states that “the current design of the Thorndike Place development meets regulatory requirements, with a 2 to 1 compensatory flood storage ratio, as well as a design flood elevation (DFE) in accordance with FEMA’s 100-year base flood elevation (BFE).” Again, it is important to note that as Weston & Sampson states, the design meets both the Wetlands Protection Act and Town of Arlington Wetlands Protection Regulations.

FEMA Regulations vs. Neighboring Communities

- Weston & Sampson states that current Massachusetts legislation requires that buildings be designed to the 100-year base flood elevation (BFE), which is the elevation that Thorndike Place design relies on at 6.8 feet NAVD88. BSC concurs that this is an accurate statement of the law. Additionally, Weston & Sampson states that FEMA defines the 500-year flood elevation at 10.75 feet NAVD88 and that the first floor living space for the Thorndike Place development is designed at an elevation of approximately 13 feet NAVD88, making it suitable for projected sea level rise (SLR) and storm surge (SS) effects. Again, BSC concurs with these statements.
- BSC has reviewed the Cambridge Climate Change Vulnerability Assessment and the Cambridge FloodViewer to understand the anticipated 2070 SLR/SS and precipitation flooding at the Site. FEMA shows that the flood elevation upstream of Route 2 (Cambridge) and downstream of Route 2 (Site) is the same. Using this, it is anticipated that the 2070 flooding at the Site will be the same as shown on the Cambridge FloodViewer directly across Route 2. The Cambridge FloodViewer shows the anticipated 2070 100-year SLR/SS flood elevation 22.5 Cambridge City Datum (see below). The Cambridge City Datum is 11.65 feet above NAVD88. The equivalent 2070 100-year flood elevation on the Site is 10.85 feet NAVD88 or an increase of approximately 4 feet above the current FEMA 100-year flood elevation, which is and approximately 2 feet below the proposed elevation of the first floor living space at elevation 13 NAVD88.



Design Storm Depths

- Under Chapter 40B, the project is required to meet the precipitation frequency statistics based on Technical Paper 40 (TP40) as referenced in the Wetland Protection Act and the Massachusetts Stormwater Handbook. The Town of Arlington Wetlands Protection Regulations require the use of the more conservative Cornell precipitation frequency statistics. While not required to apply the Cornell statistics, the project stormwater management design has utilized the Cornell precipitation frequency statistics as required by the Town of Arlington Wetlands Protection Regulations. To further clarify, the National Oceanic Atmospheric Administration (NOAA) Atlas 14 Plus Method for determining design standards for precipitation have not been adopted by MassDEP or the Arlington Conservation Commission and should not be a requirement of this project.

Additional Resilient Design Issues

Deployable Flood Barriers

- The design of flood protection/flood barriers for the Garage Level of the project will be incorporated into the building plans to be submitted for building permit. Flood protection design will incorporate operational considerations including installation needs (time range for deployment, manpower, installation cost, etc.), repair during storm event, retraction needs, storage, and re-use of the products in the selection of the appropriate flood barriers. In other words, the project will not be retrofitted, but the resilient design issues will be incorporated into the building's construction.

Base Flood Elevation

- The proposed building will not be located within a flood FEMA hazard area. Additionally, the first floor of livable units have been designed to be more than 1 foot above the FEMA 100-year floodplain of elevation 6.8 NAVD88 and the 2070 100-year SLR/SS flood elevation of 10.85 NAVD88.



Compensatory Flood Storage Ratio

- The provision of a compensatory flood storage at a ratio of 2 to 1 will NOT minimize the area of Bordering Land Subject to Flooding, impacting flood recovery. Compensatory storage at the Town of Arlington Wetland Protection Regulations ratio of 2 to 1 will actually increase the area of Bordering Land Subject to Flooding on the Site upon completion of grading and construction.

Urban Heat Island Effect

- There were no urban heat island regulations in effect at the time of Thorndike Place Comprehensive Permit application. The current site design greatly reduces potential heat island effects by significantly reducing the area of the Site to be cleared for development and reducing the building and pavement impervious surfaces. The building will include white roofs and rooftop stormwater detention. Additionally, the project will provide a floodplain restoration plan for the area of compensatory flood storage and will conform to vegetation removal and replacement requirements identified in Section 24 of the Wetland Protection Regulations

Summary

As noted above, the Applicant has reviewed and considered increased flooding from sea level rise, storm surge, and precipitation projections in the design of the project. As stated, Site has previously been used as an area for flood storage, and will continue to do so as the area proposed for development is located outside of the floodplain with the exception of a minimal impact that is being mitigated at a 2 to 1 ratio. The design of Thorndike Place considers the best available climate data for this location (City of Cambridge data), and the impacts of the proposed development under future climate scenarios has been assessed. BSC Group provides the following responses to the Weston & Sampson recommendations regarding the design of Thorndike Place:

1. BSC has reviewed the Cambridge Climate Change Vulnerability Assessment and the Cambridge FloodViewer to identify anticipated 2070 100-year SLR/SS flood elevations for the Site and has presented the findings from that review above.
2. Under Chapter 40B, the project is required to meet the precipitation frequency statistics based on Technical Paper 40 (TP40) as referenced in the Wetland Protection Act and the Massachusetts Stormwater Handbook. The Town of Arlington Wetlands Protection Regulations require the use of the more conservative Cornell precipitation frequency statistics. The project stormwater management design has utilized the Cornell precipitation frequency statistics as required by the Town of Arlington Wetlands Protection Regulations.
3. The design of flood protection/flood barriers for the Garage Level of the project will be incorporated into the building plans to be submitted for building permit. Flood protection design will incorporate operational considerations including installation needs (time range for deployment, manpower, installation cost, etc.), repair during storm event, retraction needs, storage, and re-use of the products in the selection of the appropriate flood barriers.



4. The provision of a compensatory flood storage at a ratio of 2 to 1 will NOT minimize the area of Bordering Land Subject to Flooding, impacting flood recovery. Compensatory storage at the Town of Arlington Wetland Protection Regulations ratio of 2 to 1 will actually increase the area of Bordering Land Subject to Flooding on the Site upon completion of grading and construction.
5. The current site design greatly reduces potential heat island effects by significantly reducing the area of the Site to be cleared for development and reducing the building and pavement impervious surfaces. The Building will include white roofs and rooftop stormwater detention. Additionally, the project will provide a floodplain restoration plan for the area of compensatory flood storage and will conform to vegetation removal and replacement requirements identified in Section 24 of the Wetland Protection Regulations

Should you have any questions on this information, please do not hesitate to reach out to me at (617) 896-4321 or jhession@bscgrop.com.

Sincerely,

BSC Group, Inc.

John Hession, P.E.
Vice President

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