



May 5, 2021

**BY ELECTRONIC MAIL: ayogurtian@belmont-ma.gov
AND BY FIRST CLASS MAIL**

Belmont Zoning Board of Appeals
Belmont Town Hall
455 Concord Avenue
Belmont, MA 02478

Re: Application for Comprehensive Permit – 91 Beatrice Circle, Belmont

Dear Members of the Board:

As you know, I represent neighbors and abutters to the proposed 12-unit Chapter 40B project at 91 Beatrice Circle in Belmont, including the Belmont citizens group, Build Wise Belmont. I am writing to comment on the civil engineering peer review letters that have been filed with the Board, to which the Applicant has responded. In our opinion, the Applicant's responses are woefully inadequate, and significant public safety, environmental and design issues still loom over this ill-conceived project.

The Board received extensive peer review comments from our civil engineer, John Chessia, on March 23, 2021, and from Jesse Johnson at Weston & Sampson ("W&S") on March 29, 2021. These two letters were mostly consistent in their comments. The Applicant's engineer, John Burke, filed a response on April 23, 2021. There remain many outstanding issues of concern, which I will highlight below.

I. Drainage Design

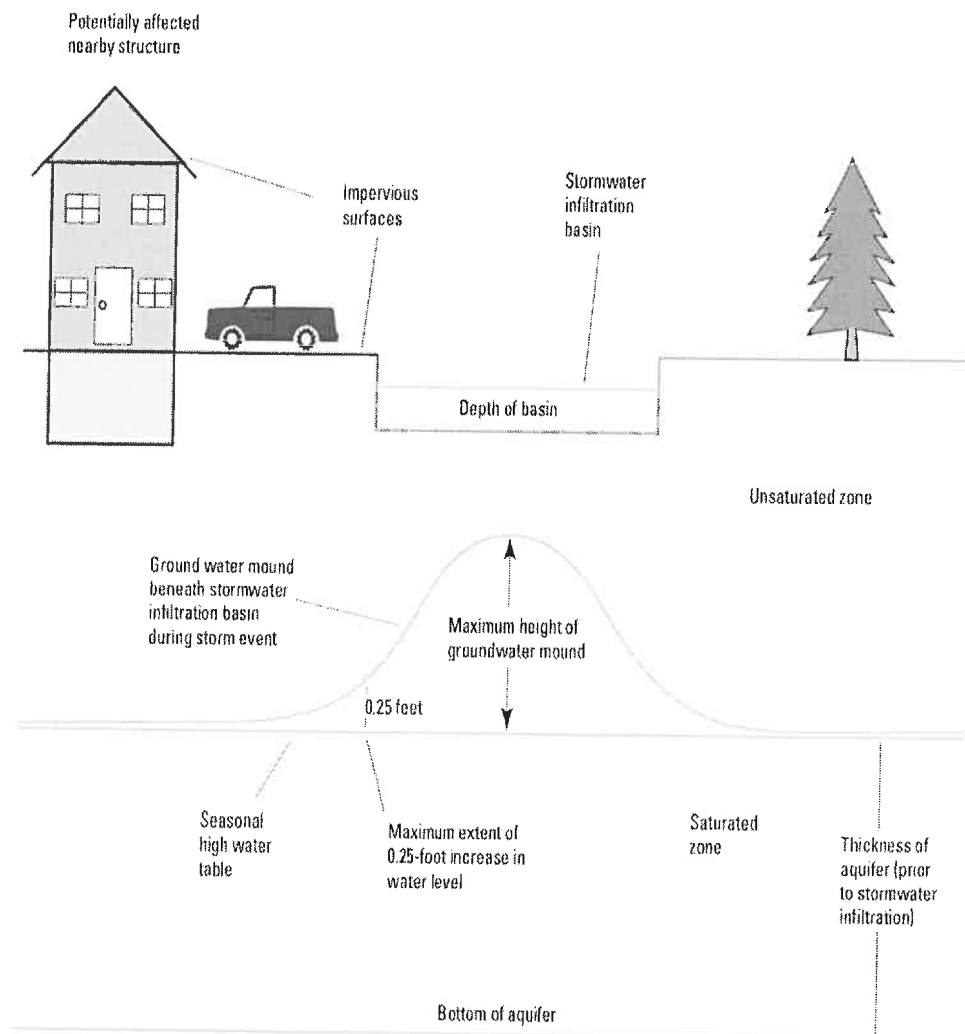
(a) Hydrology Modeling Errors. The Applicant has now agreed to use the correct hydraulic soil group classification (A instead of C) in its hydrology model, but at the same time inappropriately changed other input variables. See, W&S, 5/5/21, pp. 1, and 5. Specifically, Mr. Burke materially mis-characterized the existing surface conditions of the Project Site, overestimating runoff under existing conditions. Overestimating existing runoff conditions is inappropriate in stormwater modeling, as it provides a false baseline by which the engineer can justify designing a smaller drainage system for post-development runoff management. W&S correctly flagged this improper adjustment on pages 1 and 5 of its most recent letter.

(b) Mounding Analysis Errors. W&S appropriately criticized the Applicant for not initially providing a "mounding analysis" for the large, subsurface stormwater infiltration system which serves to collect most of the runoff generated on the Site. A mounding analysis is necessary to accurately predict the runoff storage capacity of infiltration chambers during

extreme storm events. If these chambers are not sized properly, flooding of downgradient properties and Frontage Road will occur. The graphic below (**Figure 1**), reproduced from a USGS publication, illustrates the groundwater mounding effect from infiltration systems. If the mound rises to an elevation that is *higher* than the bottom of the chamber, the chamber loses its storage capacity.

Figure 1

Simulation of Groundwater Mounding Beneath Hypothetical Stormwater Infiltration Basins



W&S correctly noted in its current letter (p. 5) that Mr. Burke applied incorrect variable assumptions in his mounding analysis, which has the effect of underestimating the mounding effect, and thus underestimating the risk of failure of this critical drainage facility.

(c) Unauthorized Connection to the State Highway Drainage System. The drainage design still proposes a direct connection to the storm sewer within Frontage Road. Mr. Chessia noted in his March 23rd letter that private property owners cannot tie into a state highway drainage system without a state highway access permit. W&S echoed this comment on page 6 of its current letter (Comment #24). Mr. Burke did not address this comment, and therefore we still question the legality of this proposed connection.

(d) Noncompliance With Dimensional Requirements. W&S noted (p. 9) that the proposed infiltration chambers are sited too close to the building foundations. The state stormwater standards require a minimum 10-foot separation, where the proposed chambers are set back approximately 5 feet.

Under the Town's Stormwater Management and Erosion Control Bylaw, all projects under the Bylaw's jurisdiction must comply with all applicable provisions of the Massachusetts Stormwater Management Standards. Bylaw, §36.6.4.1. There is no provision in the Bylaw for waivers from these requirements.

While we recognize that under Chapter 40B waivers may be obtained from local bylaws, this case is unique. The Town's adoption and implementation of its Stormwater Bylaw is mandated by the federal and state Clean Waters Acts, which trump Chapter 40B. Under a so-called "National Pollutant Discharge Elimination System" permit issued by the United States Environmental Protection Agency under the Clean Waters Act, which was issued jointly with the state Department of Environmental Protection, all municipalities with storm sewer systems must adopt regulatory controls such as stormwater management bylaws that mandate compliance with the state stormwater standards. Thus, if the Applicant is correct that this Project will directly discharge runoff into a municipal storm sewer system in Frontage Road, compliance with the state stormwater standards is mandatory and cannot be waived by the Board.

In its current letter, W&S suggested that "if the Applicant does not want to adhere to the recommended 10-foot separation," it could perform an alternative geotechnical analysis. We respectfully disagree with W&S's presumption that the Applicant can avoid compliance with this setback requirement, for the reasons stated above. Even if the drainage system in Frontage Road is under *state* jurisdiction, which we believe is true, the Applicant will likely have to comply with the same standards – the Commonwealth has the same obligations as the Town of Belmont under federal law.

(e) Absence of Critical Soil and Groundwater Data. Most critically, the Applicant has not performed any soil testing within the location of the proposed infiltration system (under the proposed central driveway between the buildings). Soil testing is an essential prerequisite to drainage modeling, as it establishes the infiltration rates, hydraulic conductivity of the soils and the existing groundwater elevations. These are essential data points for any stormwater model,

and are required under the state stormwater standards. Designing a stormwater system *without* this information is purely speculative. As W&S noted, gathering this data now is important because other test pits performed on site revealed the presence of shallow ledge or bedrock (at elevations 219.7 and 217.67 feet). Stormwater does not infiltrate through bedrock (or it does very slowly), and the stormwater regulations require at least 2 feet of separation between an infiltration system and bedrock or groundwater (W&S, p. 7). Where the infiltration systems are already at an elevation of 219 feet, this separation would not be met if bedrock is similarly found at 219 feet or higher in the location of the infiltration systems.

The Applicant's response is that it will provide this data after the Board closes its public hearing and issues its permit. The Applicant states that the existing house is in the location of the infiltration system, and therefore would need to be demolished before testing can be done. This is factually incorrect and therefore not a reasonable defense. Using a standard ruler and the scale on the bottom of the site plans, it is evident that the western edge of the proposed infiltration system is approximately **20 feet** from the western property boundary, and the western edge of the existing house is approximately **60 feet** from the same boundary. See **Figure 2** below. Therefore, there is an area approximately 40 feet wide where test pits could be dug on the west side of the house. Further, the existing garage above the east side of the proposed infiltration system could be removed to perform a test on that side. We concur with W&S that if soil conditions in this location are different than what Mr. Burke assumes, "the required redesign needed to comply with MA Stormwater Standards would be significant and possibly not feasible." To ensure the most conservative design, test pits should be done now (this spring), when groundwater levels are at their seasonal highest.

(f) The Intersection is Unsafe at Any Speed. Finally, we concur with W&S's comment that the driveway intersection at Frontage Road will be unsafe in the winter, as it will be susceptible to icing. This is particularly concerning given that the driveway has a steep downgrade of 14% as it approaches Frontage Road, enters Frontage Road with prevailing speeds of approximately 50 MPH, and is in the same location as a pedestrian crosswalk across Frontage Road and a sidewalk across the driveway. W&S's suggestion of a catch basin is not an adequate solution, as catch basins are prone to filling with sediment and leaf litter, and thus often do not store the volume of runoff they are originally designed for (which will be exacerbated here with its location below a 14% grade driveway).

II. Other Outstanding Civil Design Issues

Mr. Chessia raised a number of other, non-drainage design issues on March 23, 2021, which have not been addressed, as follows:

- a. In the case of the northerly wall at the property line the proposed system would not physically fit and is not practicable to install without impacting the right of way for Beatrice Circle. The wall may require part of the supporting geotextile be placed in Beatrice Circle. **Not addressed.**

- b. In the case of the easterly wall, the catch basins as proposed may not physically fit as designed as the wall block and geotextile reinforcement could be compromised by the location of the catch basins. **Not addressed.**
- c. The westerly wall has more space to install but would be approximately 6 feet high and is only 5 feet from another retaining wall on the abutting property. The excavation required to install this wall could compromise the foundation for the existing wall on the abutting property. A Structural/Geotechnical Engineer should analyze the construction of the existing wall to determine the stability of the wall relative to the proposed excavation. The existing wall is identified as concrete on the plans. It is unclear if there is a footing or if the wall is a gravity wall, the foundation depth is not specified and may not be on a record plan. The proposed wall would be over 7 feet high and would require a structural design and building permit. The reinforcing would likely require further excavation behind the wall for structural support and may not be feasible. **Not addressed.**
- d. There is a missing contour on the south side of the property at the 227' contour or an easement would be required from the Devine property. **Not addressed.**
- e. The design requires grading up to the property line on the southerly side of the site, including excavations for retaining walls and foundations. Foundations are 10' – 20' from the property line and retaining walls are as close as 3' to the property line. This will impact trees along or near the lot line, in particular the viability of large trees as impact to the root zone can harm existing trees. Not addressed.

The enormity of these outstanding design issues is alarming at this stage of the permitting process, and raises serious doubt as to the feasibility of the Project at the proposed density of 12 units. The Board's recent supplemental speed study of Frontage Road, confirming our own February study, intensifies our objections with the current design of this Project, which we will address in a separate comment letter next week.

Thank you for your continued diligence in reviewing this application.

Very truly yours,


Daniel C. Hill

cc: Jesse Schomer, Esq.
David Lyons, Esq.
Belmont Select Board
Belmont Planning Board
Clients

Figure 2

