

March 29, 2021

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Tel: 978.532.1900

Nicholas Iannuzzi, Chair  
Zoning Board of Appeals  
Town of Belmont  
455 Concord Avenue  
Belmont, MA 02478

Re: **Stormwater Peer Review of Proposed Multi-Unit Residential Development at 91 Beatrice Circle, Belmont, MA 02478**

Dear Chair Mr. Nicholas Iannuzzi and Board of Appeals Members:

Weston and Sampson Engineers, Inc. (Weston & Sampson) has reviewed portions of the Zoning Board of Appeals (ZBA) Application package related to stormwater submitted by 91 Beatrice Circle, LLC (the Applicant) for the proposed Chapter 40B Comprehensive Permit Application for the proposed multi-unit residential development at 91 Beatrice Circle. The following pieces of the Application have been included in our review which were downloaded from the Comprehensive Permit Application Package from the Town of Belmont's ZBA website.

1. Engineering Report prepared by DeCelle-Burke-Sala & Associates, Inc., dated November 4, 2020 (downloaded from supplemental materials)
2. Proposed Site Plan, 91 Beatrice Circle, Belmont, Massachusetts, dated November 4, 2020, prepared by DeCelle-Burke-Sala & Associates, Inc. (downloaded from Tab 7 – Engineering Plans)

Below is a summary of Weston & Sampson's review comments and recommendations to DeCelle-Burke-Sala & Associates, Inc. (DBS) Engineering Report and Proposed Site Plan Drawings. Our review compares the submitted documents referenced above to the Massachusetts Stormwater Handbook Stormwater Management Standards, Town of Belmont Stormwater Management and Erosion Control Rules and Regulations, Town of Belmont Stormwater Management and Erosion Control By-Law, and Town of Belmont Sanitary Sewer and Storm Drain Regulations and Specifications.

### Engineering Report

#### **Section 1 – Project Narrative**

Proposed Conditions-

1. *The pedestrian walkway is described having a width of 4 feet in the narrative, whereas the Site Plans show a width of 5 feet.*
  - a. Please confirm which width was used in the calculations and update.

Stormwater Management-

2. *DBS states "Despite the soil mapping calling for "A" soils (Charlton) DBS calculated land coverage numbers (CN) using Hydrologic Group "C" soils based upon soil evaluations performed within the vicinity of the project."*
  - a. Weston & Sampson does not agree with this assumption. DBS stated in their existing conditions summary that on-site test pits were used to confirm the Natural Resources Conservation Service (NRCS) mapping. Test pit logs included on the Existing Conditions Plan (Sheet 2 of 8) of the Site Plans identify parent soils as "Fine Loamy Sand". The NRCS classification for Charlton and the Rawls Rate soil classifications summarized in the Massachusetts Stormwater Handbook state that Loamy Sand is HSG A. HydroCAD modeling and recharge volume calculations should be updated for this site based on an existing conditions soil classification of HSG A.

#### **Section 3 – Management Plans**

Stormwater Operation & Site Maintenance Plan (SOMP)-

3. *Snow Management "Proper snow management practices will be implemented to minimize runoff and pollutant loading impacts. Plowed or shoveled snow will be placed in pervious areas at the edges of the pavement where it can slowly infiltrate. Snow will be placed on to pervious areas that are not subject to*

*excessive shade from buildings or vegetation. All accumulated sediment from snowmelt shall be removed each spring.*"

- a. We recommend that signage is installed at the east edge of the parking lot to prevent snow being stockpiled or pushed behind the retaining wall, and direct runoff of this snowmelt to the abutting property owner. Signage will also provide additional direction to a snow removal contractor to avoid this area for stockpiling.
  - b. It is also recommended that a Site Map be included with the SOMP that identifies allowable snow storage areas.
4. *Catch Basins and Deep Sump Drain Manholes*
    - a. It is recommended that the inspection frequency be increased to a minimum of twice per year (spring for increased salt and sand load and fall for increased leaf debris load).
  5. *SNOUT® (catch basin / manhole Water Quality Hood)*
    - a. It is recommended that this section be updated to follow the maintenance requirements outlined for the SNOUT. More frequent inspection is recommended following the first year of installation.
  6. *Underground Cultec Chambers*
    - a. It is recommended that additional O&M detail related to inspection and clean out of the Cultec Chambers is provided in the SOMP.
  7. *Site Management*
    - a. We recommend that mowing be identified in the general site management section of the SOMP.
  8. *Illicit Discharge Statement*
    - a. It is recommended that the Illicit Discharge Statement is signed by the appropriate party and submitted to the Town prior to the start of construction. This could be made as a condition of approval.
  9. In accordance with Standard 9 of the Massachusetts Stormwater Handbook, it is recommended that a Site Plan be included with the O&M Manual which identifies the location of all stormwater BMPs in each treatment train as well as the final discharge points.
  10. In accordance with the Town of Belmont Stormwater Management and Erosion Control Rules and Regulations Section III.D(2), an "Operation and Maintenance Compliance Statement", certified by a registered professional engineer shall be drafted and included with the SOMP. It is recommended that the Compliance Statement is signed by the appropriate party and submitted to the Town prior to issuance of an occupancy permit. This could be made a condition of approval.

#### Erosion & Sedimentation Control Plan-

11. The following information should be added to the Erosion & Sedimentation Control Plan in accordance with the Massachusetts Stormwater Manual; Erosion and Sedimentation Control Plan drawing (identifying the perimeter control locations, construction entrance, and soil stockpile area), inspection schedule and log, and an explanation of snow storage and removal during construction.
12. *Section 5.1 bullet 2 "place erosion control barrier at limit of work where possible"*
  - a. We recommend only installing erosion control barrier parallel to existing ground contours to prevent channelizing flow and scouring of non-vegetative surfaces.
13. *Section 5.1 bullet 4 "Place stone apron at construction exit for site."*
  - a. We recommend moving this earlier in the construction sequence.
14. *Section 5.1 all bullets related to stockpiles*
  - a. We recommend installing additional erosion control barriers at the downgradient edges of all soil stockpiles staged at the site. Soil stockpiles shall not be staged directly at abutting neighboring property lines. A soil stockpile detail should be added to the Site Plan drawings.
15. *Section 5.1 – catch basin protection*

- a. Protection of existing catch basins along Frontage Road is not identified. It is recommended that a silt sack be installed in the existing catch basin at the entrance of the site.

16. *Section 5.2.3 – Mechanical or Hand Sweeper*

- a. It is recommended that water be applied to areas prior to sweeping to minimize dust to abutting properties.

17. *Section 5.2.4 – Crushed Stone Construction Apron*

- a. It is recommended that the construction apron be extended to a minimum of 30 ft long in accordance with Massachusetts Erosion and Sedimentation Control Guidelines.

## Section 4 – Stormwater Management Data

### Stormwater Checklist

18. *Standard 3*

- a. The impervious area for the site draining to the infiltration structure is less than 100%. Additional recharge volume should be accounted for in the design to account for this difference in accordance with the Massachusetts Stormwater Standards.
- b. The required 44% TSS pretreatment is not met. The drainage manhole should not be used for 25% credit since it is not an off-line structure.
- c. The material for the culvert for the stormwater model node 5P (DMH) and 1P (Infiltration System) should match, please update.
- d. Additional calculations or modeling files are required to confirm the 2-hour recharge requirement for the simple dynamic method has been achieved.
- e. A mounding analysis is missing and should be submitted by DBS for review.

19. *Standard 4*

- a. The drainage manhole should not be used for 25% credit since it is not an off-line structure. The total required TSS removal of 80% is not achieved.

### HydroCAD Model

20. *Existing Conditions at the site is modeled showing all stormwater flow off-site to the east.*

- a. Existing topography at the site suggests that stormwater flows off-site to three different areas; off-site to the south (northwest corner, southeast to the corner of the stone patio), a small segment along the north flows down the site driveway to Frontage Road, and the remaining runoff flows off-site to the east. DBS shall update their existing conditions model and confirm that post-development peak discharge rates to the east remain below existing peak discharge rates.
21. The proposed conditions HydroCAD model combines all runoff flow to one "reach". This does not accurately model the post development off-site discharge to the east, the towns MS4 storm sewer system, and overland flow toward Frontage Road. There appears to be an increase in impervious surface directed toward Frontage Road for the post-development conditions. DBS should update their proposed conditions model.
22. DBS shall also compare pre- and post-development discharge volumes for the 2-, 10-, 25-, and 100-year 24-hour storm events to comply with the Town of Belmont Stormwater Management and Erosion Control Rules and Regulations Section III.E.3.
23. It is recommended that a separate outfall structure/pipe is provided for the proposed infiltration system. This would allow for easier access and maintenance of the system as well as separation of inlet and outlet flows.
24. DBS shall include an analysis to confirm the Town of Belmont's MS4 system can handle the additional load of the proposed development and submit required documentation to comply with Town of Belmont Stormwater Management and Erosion Control Rules and Regulations Section III.E.4.
25. A pipe analysis should be provided to confirm the capacity for a 25-year storm, and adequate self-cleansing velocities of the pipes for the 2-year storm.

**Proposed Site Plan**

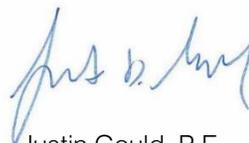
26. *The parking area at the east of the site has a proposed grade of 225 with a retaining wall dropping down to an elevation tying into existing grade at 219 feet.*
  - a. With a 6-foot grade drop it is recommended that a fence be installed at the back of this parking area.
27. *Distance between the proposed infiltration structure and building foundations measures approximately 5 1/2 feet.*
  - b. The Structural BMP Specifications for the Massachusetts Stormwater Handbook requires a minimum horizontal distance of 10 feet between an infiltration structure and building foundations.
28. *Three test pits were performed on-site with two test pits having refusal at elevations 219.7 and 217.67.*
  - c. The proposed infiltration structure has a proposed bottom elevation of 219. The minimum separation distance of 2 feet between the bottom of an infiltration structure and bedrock/groundwater is not met. It is recommended that the infiltration design be evaluated and changed as necessary to meet the minimum separation distance. Additionally, it is recommended in the Massachusetts Stormwater Handbook that a minimum of three test holes be performed in the bottom of the proposed infiltration area. We recommend additional testing is provided prior to the start of construction. If conditions deviate from assumptions provided in the design, then the Applicant should submit a revised design for review and comment.
29. *A flexible wye connection is proposed for the project's storm drain into the Town's existing drain line.*
  - d. It is recommended that a drain manhole be used for this connection.
30. There appears to be a potential conflict between the drain line connecting from the DMH to the infiltration structures and the proposed water line. A depth and minimum separation to the water should be provided.
31. Invert elevations of the gutter drain system from the dwellings to the infiltration structure should be added to the Site Plan. It should be confirmed that the proposed roof and gutter system will convey all runoff to the underground system. A detail of the connections to the infiltration structures should also be added to the Site Plan.
32. Update references of drainage inverts to be consistent between the HydroCAD model and Site Plans.
33. Based on installation guidelines for the CULTEC Recharger 330XLHD, the minimum cover for paved surfaces is 16 inches to the bottom of the pavement surface, and 18 inches to finish grade for unpaved surfaces. Additionally, the maximum cover for paved surfaces should be provided. The detail should be updated to be consistent with manufacturer requirements.
34. Detail for pre-cast concrete catch basin is shown with an 8" PVC pipe. Standard practice for all new drain lines is 12". We recommend the detail and network piping get updated to at least 12" minimum.
35. The proposed length for all pipe segments should be provided to confirm inverts and slopes.
36. The proposed access driveway design for the project appears to have more pavement generating runoff toward Frontage Road. The design has a crowned roadway 20' wide at over 14% grade and no stormwater inlets at its intersection. This design could lead to increased runoff toward Frontage Road.

If you have any further questions or require any additional information, please feel free to contact me. I may be reached at (978) 935-3795 by email at [johnson.jesse@wseinc.com](mailto:johnson.jesse@wseinc.com).

Sincerely,  
WESTON & SAMPSON ENGINEERS, INC.



Jesse Johnson, P.E.  
Senior Project Manager



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cc: Glenn Clancy, P.E., Director, Town of Belmont  
Melinda Costello, P.E. Weston & Sampson