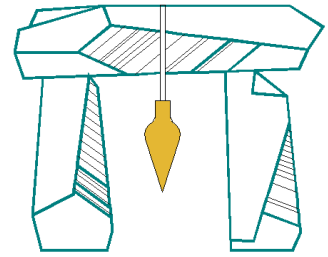


April 23, 2021

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

Re: **Peer Review Response**
91 Beatrice Circle
Belmont, MA

DeCelle-Burke-Sala



& Associates, Inc.

Dear Mr. Chair & Board of Appeals Members:

DeCelle-Burke-Sala & Associates, Inc. (DBS) is in receipt of the Stormwater Peer Review Letter prepared by Weston & Sampson Engineers, Inc. (WSE) dated March 29, 2021 regarding the proposed residential development project located at 91 Beatrice Circle. DBS has prepared this written response to each item listed in the WSE letter. Where our responses to WSE's recommendations include making revisions to DBS's site plans and engineering report, these documents are attached to this letter with a revision date of April 19, 2021. Our responses for each item are in a bold font following the WSE narrative from the referenced letter. DBS's responses are as follows:

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.

The amount of proposed impervious area calculated used a five foot wide sidewalk width.

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.

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DBS has revised the HydroCAD analysis to use HSG-A soils as requested by WSE. The revised stormwater management calculations are included in the Revised Engineering Report.

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.

DBS has revised the site plan to include signage to prevent snow being disposed of over the wall.

- b. It is also recommended that a Site Map be included with the SOMP that identifies allowable snow storage areas.

A Site Map identifying snow storage locations is included in the SOMP .

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).

The SOMP currently calls for the catch basins and deep sump drain manholes to be inspected a minimum of four times per year. The SOMP has been revised to required cleaning the catch basins and deep sump drain manholes twice a year.

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.

The SOMP has been revised to include SNOUT® inspection recommendations.

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.

The SOMP has been revised to include additional manufacturer’s specifications in regards to inspection and clean out of the Cultec Chambers.

7. Site Management

- a. We recommend that mowing be identified in the general site management section of the SOMP.

The SOMP has been revised to include landscape maintenance measures.

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.

The Illicit Discharge Statement shall be signed by the appropriate party and submitted to the Town prior to construction.

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.

The Site Plan will be included with the SOMP identifying the location of all stormwater BMPs and 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.

A compliance statement certified by a registered professional engineer will signed by the appropriate party and submitted to the Town prior to issuance of an occupancy permit.

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.

The Erosion & Sedimentation Control Plan has been revised to include perimeter control, construction entrance, soil stockpile area, an inspection log and snow management 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.

A narrative was added to the plans and to the Erosion & Sedimentation Control Plan to instruct the contractor to install erosion control barriers and on-site stormwater controls to prevent the generation of erosive forces.

13. Section 5.1 bullet 4 "Place stone apron at construction exit for site."
a. We recommend moving this earlier in the construction sequence.

The construction sequence has been revised to place the stone apron at the construction exit earlier in the construction timeline.

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.

A proposed erosion control barrier is proposed around the soil stockpile area.

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.

A proposed silt sack will 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.
b. **The erosion control plan has been revised to include the application of water prior to sweeping.**

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.

The construction apron has been revised to 30 ft.

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.
A 1.29 volume factor was added to the Standard 3 compliance calculations and these calculations are included in the revised Engineering Report.
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.

DBS has included a Contech CDS unit designed to remove 50% of the TSS generated from the 100 year event flow of 2.79 cfs. DBS used this value despite direct connections of roof runoff to the infiltration system which would reduce this flow. We believe the TSS reduction of 50% to be conservative for this structure. With a treatment train of the hooded deep sump catch basins and the CDS Unit providing the 50% a TSS pretreatment value of 62% is met exceeding the 44% requirement. CDS design materials are included in the revised Engineering Report. This unit's effectiveness for yearly statistical TSS removal is 93% effective.

- c. The material for the culvert for the stormwater model node 5P (DMH) and 1P (Infiltration System) should match, please update.

The HydroCAD model has been revised and this issue eliminated.

- d. Additional calculations or modeling files are required to confirm the 2-hour recharge requirement for the simple dynamic method has been achieved.

Calculations are attached confirming the 2-hour recharge requirements for this project using the simple dynamic method.

- e. A mounding analysis is missing and should be submitted by DBS for review.

A mounding analysis is provided 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.

The drainage manhole being used for TSS removal has been removed from the design. The 80% removal is exceeded by designing a treatment train including deep sump hooded catch basin, a CDS proprietary water quality unit and an infiltration system.

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.

The existing conditions model has been revised to include the three areas requested by WSE. Calculations attached confirm post-development peak discharge rates are below pre-development peak discharge rates for all three model points.

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.

The proposed conditions model has been updated confirming the reduced post-development peak discharge rates to the east, to the town's MS4 system and to Frontage Road. There is no post-development increase of impervious area to Frontage Road, in fact there is a reduction. The model has been revised to compare the flows pre- and post-development to the three separate watershed areas.

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

Pre- and post-development discharge volumes for the 2-, 10-, 25- and 100-year 24-hour storm events have been tabulated for the Board's review. The tabulation shows a stormwater volume net reduction from the site.

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.

A proposed outlet control structure manhole has been added to provide for easier access and inspection to the outfall structure.

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.

DBS has determined that the peak flow and volume of stormwater runoff from this site is reduced and the water quality has substantially improved. DBS can state and has shown by calculation that the Town of Belmont's MS4 system is well protected from any negative stormwater impacts from this project by reducing peak flow, reducing stormwater volume and by improving off-site stormwater quality from this property.

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.

See pipe analysis calculations attached.

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.
- With a 6-foot grade drop it is recommended that a fence be installed at the back of this parking area.

A proposed 42" fence will be installed on the top of the walls exceeding 30" in height proposed for this project.

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.

It is our belief that the vertical and horizontal setbacks of the underground HDPE recharge system can be constructed safely and all long and short term related concerns regarding this foundation setback can be addressed through proper design and construction. The long term concern of flooding living space for this project is negated due to the slab-on-grade construction. The underground recharge structure is below the slab elevations. In addition, structural foundation concerns can be eliminated by designing and constructing the building footings to allow groundwater to move freely without supporting soil movement. This can be accomplished because the system is being constructed together and will work together for the long term. Short term construction related impacts can be eliminated by using proper construction and excavation techniques along with necessary geotechnical material or soil required to fully support the building in the environment proposed. A geotechnical foundation design will be submitted with the building permit application.

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.

Additional soil tests will be performed to better assess the depth to bedrock upon the demolition of the existing home. The applicant is prepared to remove bedrock to allow for the proper separation of the infiltration structure.

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.

A drain manhole has been proposed for the connection to the Town's existing drain line.

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.

A note asking for 12" separation between the drain pipe and water main while maintaining a minimum of five feet of cover for the water main has been added to the plans.

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.

Invert elevations of the roof drains are on the site plan and confirmation made that the system will convey all runoff to the underground system. A profile view of the Cultec Recharger structure showing invert elevations is provided on the Site Plan.

32. Update references of drainage inverts to be consistent between the HydroCAD model and Site Plans.

References to drainage inverts have been confirmed to be consistent between the HydroCAD model and the Site Plan.

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.

The Cultec Recharger 330XLHD detail has been 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.

The pre-cast concrete catch basin detail has been revised to specify a 10" HDPE pipe, consistent with the pipe sizes specified on the site plan. The 10" pipe is more than sufficient to handle the flows generated from this site. Please see the Rational Method Pipe Sizing Calculations included in the revised Engineering Report

35. The proposed length for all pipe segments should be provided to confirm inverts and slopes.

The proposed pipe lengths for the drain and sewer pipes are included in the plan.

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.

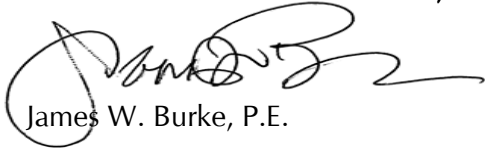
We revised the watershed maps and HydroCAD calculations at the request of WES and based on the calculations the stormwater flow is reduced to Frontage Road for all

storms. It is true the total impervious areas for these watersheds contributing to Frontage Road has increased by 321 s.f. when comparing pre- and post-construction numbers. However, the overall post-construction watershed area contributing to Frontage Road has decreased by 2,124 s.f. The design detains enough of the sub-watershed to reduce the stormwater flow off-site. Please also note that the off locus post-construction impervious area has decreased by 128 s.f. located within the Beatrice Circle road layout.

It is our hope that the plan revisions and supplemental information attached address WSE concerns. We look forward to presenting these revisions to the Board at the next scheduled hearing.

Sincerely,

DeCelle-Burke-Sala & Associates, Inc.



James W. Burke, P.E.