

# JOE CASALI ENGINEERING, INC.

CIVIL • SITE DEVELOPMENT • TRANSPORTATION • DRAINAGE • WETLANDS • ISDS • TRAFFIC • FLOODPLAIN  
300 POST ROAD • WARWICK, RI 02888 • (401) 944-1300 • (401) 944-1313 (FAX) • WWW.JOECASALI.COM

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June 15, 2021

Ms. Nancy L. Freeman, Principal Environmental Scientist  
Rhode Island Department of Environmental Management  
Office of Water Resources, Freshwater Wetlands Program  
235 Promenade Street  
Providence, RI 02908

RE: Application No. 21-0084  
Proposed Parking Lot Expansion to Service the Anchor Auto Group  
194 Sayles Hill Road, North Smithfield, RI  
AP 17, Lot 15  
***Response to Comments***

Dear Ms. Freeman:

On behalf of our client, Benoit Residential Realty, LLC, Joe Casali Engineering, Inc. (JCE) respectfully submits the enclosed materials in response to your April 21, 2021 Comment Letter. JCE has reviewed your comments and offers the following responses:

## *Biological Review Comments*

*Comment 1: The project as proposed does not satisfactorily avoid and minimize impacts to the 100-foot Riverbank Wetland. To avoid a significant alteration determination, RIDEM suggests that you revise the limit of disturbance (LOD) to reduce encroachment into the 100-foot riverbank wetland and incorporate a row of evergreen trees, e.g. Northern White Cedar (Tsuga canadensis) or Eastern Red Cedar (Juniperus virginiana) along the limit of disturbance (LOD) where encroachment into the 100-foot riverbank wetland is proposed. Trees should be 10-feet on center at least 4-6 feet tall after plantings.*

**JCE Response:** It is extremely important to the Applicant to retain the maximum number of parking spaces within the previously disturbed portion of this site. Along the limit of disturbance within the 100-foot riverbank wetland, a double row of Eastern Red Cedars has been incorporated into the plans, as advised. In addition, a combination of highbush blueberry (*Vaccinium corymbosum*) and silky dogwood (*Cornus amomum*) are proposed within the area where more disturbance is proposed. These plantings have been incorporated to mitigate site improvements.

*Comment 2: Please provide an Impact Avoidance and Minimization Statement as required per Rule 250-RICR-150-15.1.9B.(d) to address any alterations proposed.*

**JCE Response:** An Impact Avoidance and Minimization Statement has been provided as a supplemental document to this letter. Please refer to the attached "Written Narrative in Support of a Request for Preliminary Determination," prepared by Natural Resource Services, Inc.

## Engineering Review Comments

**Comment 1:** *The proposed project represents an increase in impervious cover over pre-project conditions. The receiving waters have an impairment for enterococcus bacteria. As per the "Appendix H.3: Water Quality Goals and Pollutant Loading Analysis Guidance for Impaired Waters: "Stormwater Compensation Method", infiltration of new runoff from increased impervious areas is needed in order for no additional offset water quality treatment to be required. Please provide a pollutant loading analysis (PLA) that will address the amount of increase in bacteria load anticipated from the proposed project. Please note that the PLA may consider any reduction in load from the removal of the existing cesspool, if there is any associated bacterial load from this outdated on-site wastewater treatment system. Another option is to investigate the potential to provide additional infiltration elsewhere on nearby property within the same watershed owned by the Applicant.*

*Specifically, please note that proposed subarea 1B has an indicated 14,217 sf of pavement that will not be infiltrated. The existing condition on site area of impervious cover is indicated as 4,324 sf. The area of 2,282 sf of entrance drive is proposed to be infiltrated. The 14,217 sf of impervious area not infiltrated represents an increase of 9,893 sf. The Table H-3 in Appendix H of the Rhode Island Stormwater Design and Installation Standards Manual lists a 70% level of treatment for bacteria while an infiltration trench or infiltration basin is indicated as having a 95% level of treatment for bacteria (Which this office rounds to essentially 100%).*

**JCE Response:** JCE has performed a Pollutant Loading Analysis, as advised. Calculations are provided below.

### Pre-Development Conditions:

**Existing impervious surfaces:** 1,194 sf house  
579 sf garage  
184 sf concrete pad  
2,496 sf driveway  
4,453 sf

**Bacteria (Equation 1a) =  $L = 1.03(10^{-3})[(P)(P_j)(R_v)](C')(A)$**

**Where:**

**P = rainfall depth (inches) = 49"**

**P<sub>j</sub> = rainfall correction factor = 0.9**

**R<sub>v</sub> = runoff coefficient expressing the fraction of rainfall converted to runoff**

**%I = 4,324 sf / 24,733 sf (site) = 0.175 = 17.5%**

**R<sub>v</sub> = 0.05 + 0.009(17.5) = 0.21**

**C' = flow-weighted mean bacteria concentration**

**Table H-2 = Residential = 7,000 col/100 ml**

**A = contributing drainage area of development site (acres)**  
**= 24,733 sf / 43,560 sf = 0.567 acres**

**$L = 1.03(10^{-3})[(49'')(0.9)(0.21)](7,000 \text{ col/100 ml})(0.567 \text{ acres})$**   
**= 37.86 billion colonies/year**

**Post-Development Conditions:**

**Proposed impervious surfaces (Subwatershed 1B): 14,217 sf parking lot**

$$\text{Bacteria (Equation 1a)} = L = 1.03(10^{-3})[(P)(P_j)(R_v)](C')(A)$$

**Where:**

**P = rainfall depth (inches) = 49"**

**P<sub>j</sub> = rainfall correction factor = 0.9**

**R<sub>v</sub> = runoff coefficient expressing the fraction of rainfall converted to runoff**

$$\%I = 14,217 \text{ sf} / 24,733 \text{ sf (site)} = 0.57 = 57.5\%$$

$$R_v = 0.05 + 0.009(57.5) = 0.5675$$

**C' = flow-weighted mean bacteria concentration**

**Table H-2 = Commercial = 4,600 col/100 ml**

**A = contributing drainage area of development site (acres)  
= 0.53 acres**

$$L = 1.03(10^{-3})[(49'')(0.9)(0.5675)](4,600 \text{ col/100 ml})(0.53 \text{ acres}) \\ = 62.85 \text{ billion colonies/year}$$

**Table #3 Pollutant Removal Efficiency Rating**

**Subsurface Chambers = 70%**

**The BMP reduces the bacteria level reduced by 62.85(0.70) = 43.995**

**The bacteria level is 67.23 - 43.995 = 23.24 billion colonies/year**

**Proposed impervious surface (Subwatershed 1C): 2,282 sf paved roadway**

$$\text{Bacteria (Equation 1a)} = L = 1.03(10^{-3})[(P)(P_j)(R_v)](C')(A)$$

**Where:**

**P = rainfall depth (inches) = 49"**

**P<sub>j</sub> = rainfall correction factor = 0.9**

**R<sub>v</sub> = runoff coefficient expressing the fraction of rainfall converted to runoff**

$$\%I = 2,262 \text{ sf} / 4,522 \text{ sf (site)} = 0.50 = 50\%$$

$$R_v = 0.05 + 0.009(50) = 0.5675$$

**C' = flow-weighted mean bacteria concentration**

**Table H-2 = Commercial = 4,600 col/100 ml**

**A = contributing drainage area of development site (acres)  
= 4,522 sf / 43,560 sf = 0.10 acres**

$$L = 1.03(10^{-3})[(49'')(0.9)(0.5675)](4,600 \text{ col/100 ml})(0.10 \text{ acres}) \\ = 10.45 \text{ billion colonies/year}$$

**Table #3 Pollutant Removal Efficiency Rating**

**Infiltration Trenches = 95%**

**The load reduced by the BMP is 10.45(0.95) = 9.93 billion colonies/year**

**The bacteria level is 10.45 - 9.93 = 0.52 billion colonies/year**

**The net bacteria level to the receiving waters:**

$$23.24 + 0.52 = 23.76 \text{ billion colonies/year (post-development)}$$

**37.86 billion colonies/year > 23.76 billion colonies/year**  
**(pre-development) (post-development)**

Therefore, the proposed BMPs provide a 37% reduction in the bacterial load to the receiving impaired waterbody compared to the pre-development conditions with the single-family dwelling. These calculations do not take into account the assumed bacterial load reduction gained by removing the outdated on-site wastewater treatment system.

*Comment 2: The proposed design also involves a proposed stormwater infiltration practice that does not meet the minimum required 50' horizontal setback to waters of the state, as per Stormwater Rule 250-RICR-150-10.8.21B10 (minimum horizontal setbacks to all other surface waters). Please revise the design or provide a technical justification explaining why the lack of the minimum standard 50' setback will not cause significant impact to the receiving waters (the F-Series Wetland).*

**JCE Response:** The proposed underground infiltration chamber system meets the required 50-foot horizontal setback to waters of the state, however, is not achieved with the proposed infiltration trenches adjacent to the F-Series wetlands. The infiltration trenches are associated with the proposed driveway into the new parking lot. It is necessary to access the lot from the existing Anchor Auto Group access driveway instead of Sayles Hill Road per direction from the Town during the Major Land Development process. The proposed infiltration trenches are the minimum size to achieve the required water quality standards for the proposed driveway. Buffer plantings have been incorporated to mitigate impacts to the wetlands from the adjacent site improvements.

*Comment 3: Please revise the typical details for the proposed infiltration trenches to ensure the use of **clean washed** crushed stone.*

**JCE Response:** The Infiltration Trench detail has been revised to specify the use of “clean washed” crushed stone, as advised.

*Comment 4: Please clearly depict the 1” outlet orifice from the proposed lined underground sand filter at the site. This outlet is indicated in the submitted analysis but does not appear to be indicated on the plans.*

**JCE Response:** A detail entitled “water quality collection system outlet detail” has been added to the Grading & Drainage Plan, Sheet 5 of 7. This detail depicts the 1” outlet orifice from the proposed lined underground sand filter at the site.

*Comment 5: Please clearly demonstrate that there will be a minimum 3' vertical separation to the seasonal high groundwater table for the proposed infiltration trenches.*

**JCE Response:** Two (2) additional test pits were observed and documented by JCE within the vicinity of the proposed driveway on May 7, 2021. The seasonal high groundwater table (SHGWT) was not encountered for Test Hole #5 and was excavated to a depth of 86-inches. The SHGWT was found at 44-inches below the ground surface for Test Hole #6. Completed soil evaluation test hole logs have been added to the Grading

**& Drainage Plan, Sheet 5 of 7. The Infiltration Trench Detail, located on Sheet 5 of 7, has been updated to clearly depict the groundwater separation more than 3 ft.**

*Comment 6: Please provide site-specific soils test information at the site of the proposed infiltration trenches or demonstrate how one or more of the soils tests done elsewhere on the site are applicable to the subject proposed infiltration trench site. Provide information to substantiate the elevation of the seasonal high groundwater table and the infiltration rate at the proposed stormwater management practice.*

**JCE Response: Please refer to our response to Comment #5 above.**

Please find the following included with this letter:

- Three (3) copies of the revised Site Plans, dated June 2021, and
- Three (3) copies of the Written Narrative in Support of a Request for Preliminary Determination.

If you should have any questions or would like to meet to discuss this application, please call me at 401-944-1300.

Sincerely,  
**Joe Casali Engineering, Inc.**

A handwritten signature in blue ink, appearing to read 'W. M. Lavery, Jr.', is positioned above the printed name.

William M. Lavery, Jr.  
*Project Manager*

cc: Robert Benoit, Benoit Residential Realty, LLC; file.