January 12, 2023

Wayland Conservation Commission
ATTN: Linda Hansen, Conservation Administrator
Wayland Town Hall
41 Cochituate Road
Wayland, MA 01778

Re: Technical Services – NOI, Cascades 40B Development
113-115 Boston Post Road, Wayland, MA

To the Members of the Commission,

BETA Group, Inc. (BETA) has completed an initial stormwater management peer review for the proposed 40B Development "Blackledge" at **113-115 Boston Post Road, Wayland, MA** (the Site). This letter is provided to outline BETA's findings, comments, and recommendations as they relate to the Massachusetts Stormwater Management Standards and Chapter 193 of the Town of Wayland bylaws.

BASIS OF REVIEW

BETA received the following items via email:

- Plan set entitled: ***Cascade Residential Housing Development, Boston Post Road, Wayland, Massachusetts, Middlesex County*** by C1.0 Engineering, LLC; dated November 14, 2022; stamped and signed by William Doyle, MA P.E. No. 41510; 6 sheets.
- Stormwater Report entitled **"113-115 Boston Post Road, Wayland Massachusetts, Post Construction Stormwater Management Report"** prepared by C1.0 Engineering, LLC, dated November 14, 2022.
- Plan entitled: ***Riverfront Area Restoration Planting Plan, 113-115 Boston Post Road, Wayland, Massachusetts*** prepared by LEC Environmental Consultants, Inc.; dated October 14, 2022;

Review by BETA included the above items along with the following, as applicable:

- ***Massachusetts Stormwater Handbook***; effective January 2, 2008.
- ***Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban Areas***

SITE AND PROJECT DESCRIPTION

The Site is comprised of two lots totaling 6.483 acres located at 113 & 115 Boston Post Road (Route 20), Wayland, Massachusetts. The Site is located on the southerly side of Route 20 and is bounded to the south by Pine Brook, a perennial stream. A portion of the Site is located on the opposite side of Pine Brook. The parcel at 113 Boston Post Road is 1.266 acres and is improved by an existing unoccupied single-family dwelling and a two-story carriage house. The parcel at 115 Boston Post Road, formerly the location of Mahoney's Nursery, is a 5.217 acre parcel improved with an existing storefront. Two greenhouses associated with the nursery have been removed, but remnants of the foundation and concrete walkways that were within the greenhouses are still visible on aerial imagery. Based upon aerial imagery, it additionally appears that several canopies were once installed in various areas around the nursery and greenhouses were removed prior to 2019.

All the parking areas and walkways around the former nurseries display areas were gravel, and there is no pavement onsite. Existing structures onsite covered an area of approximately 18,500± square feet.

The Applicant proposes to construct a 40B residential development which includes the following activities:

- Demolition of all existing commercial structures and cleanup of commercial debris;
- Demolition of the existing dwelling and carriage house;
- Installation of underground utilities including water, sewer, natural gas, and telecommunications;
- Construction of a multi-story structure with a footprint of 20,100± square feet;
- Installation of a 29-space parking lot at the east end of the structure;
- Installation of a 13-space parking lot at the west end of the structure;
- Installation of an 18-foot-wide emergency access roadway around the rear of the building;
- Construction of wastewater treatment plant with a 26' x 32' enclosure subject to a Groundwater Discharge Permit;
- Construction of 10,000± square foot subsurface sewage disposal system;
- Construction of an entrance pond at the northeast corner of the building including diversion of the existing outfall from Route 20 to Pine Brook into the pond;
- Construction of infiltration basin at westerly end of the development; and
- Site grading.

The proposed stormwater control measures will be located along the westerly edge of the development. The existing 24" outfall from the Route 20 stormwater collection system to Pine Brook will be diverted into a small ponding area northwest of the proposed structure. The runoff from the easterly parking area will be collected into three (3) catch basins and piped into the small ponding area. The outlet from the ponding area will be a 24" culvert that will flow directly into the infiltration basin. The parking lot on the west side of the building will be graded to flow directly into the infiltration basin via a rip rap lined swale.

SUBSURFACE SEWAGE EFFLUENT DISPOSAL SYSTEM

The proposed sewage treatment plant will be located along the eastern edge of the parcel along the outside edge of the parking lot. The treatment plant components as proposed will be outside the limits of the Riverfront Area. The subsurface wastewater effluent disposal system will be located south of the parking lot and building. The system as proposed is a series of trenches that will be entirely within the outer riparian zone of the Riverfront Area associated with Pine Brook. The system will be approximately 100 feet from the edge of the flagged wetlands adjacent to Pine Brook along the northerly bank of the Brook. Approximately 6' of fill will be required to construct this system, and the edge of fill will extend into the inner riparian zone of the Riverfront Area to Pine Brook within 72 feet of the flagged bank at its closest point. Based upon its proximity to Pine Brook and its location within the Riverfront Area, BETA recommends that the Applicant provide information associated with the design of the proposed leaching facilities for further review, including the mounding analysis.

DEGRADED RIVERFRONT AREA

WETLAND PROTECTION ACT

During the site walk, BETA reviewed areas of the Site to determine if they met the definition of degraded Riverfront Area based upon a lack of topsoil per 310 CMR 10.58(5) of the Massachusetts Wetland Protection Act (the "Act")

> *"A previously developed riverfront area contains areas degraded prior to August 7, 1996 by impervious surfaces from existing structures or pavement, absence of topsoil, junkyards, or abandoned dumping grounds".*

Although there is no definition of "topsoil" or its minimum depth requirements provided within the Act or its Regulations, the definition generally accepted to determine topsoil classification states:

> *"…topsoil is a mineral soil, formed at the surface or below an O horizon with little remnant rock structure, and one or more of the following properties: 1) accumulation of humified organic matter but dominated by mineral matter, and not dominated by E or B horizon properties; 2) properties resulting from cultivation, pasturing, or similar disturbance; or 3) morphology resulting from surficial processes different from the underlying B or C horizons*".[1]

This definition is cited from a Superseding Order of Conditions, MassDEP File No. 002-1015, and was therein referenced as parameters used to assist in the determination of classification of degraded areas by the Amesbury Conservation Commission and Massachusetts Department of Environmental Protection (MassDEP).

Topsoil is additionally assumed to be present if the area in question is well vegetated. In the Matter of Crystal Motor Express, Inc. versus the Lynnfield Conservation Commission, MassDEP concluded that "…because the site was well vegetated, it was subject to review under new development standards…"[2] and would not qualify as degraded or previously developed.

FINDINGS

The Applicant asserts that degraded Riverfront Area is present at the easterly edge of the parcel behind the existing house. Multiple test pits in this area revealed that topsoil was developing in the fill adjacent to the existing debris pile. It is BETA's opinion that based upon this observation of topsoil, the entire Riverfront Area from flag DRA#3 adjacent to the rockpiles along the property line and across to Flag DRA#17 is not degraded. The only exclusion within this area is the debris pile behind the carriage house.

Due to time constraints, no further test pits were conducted beyond the area behind the existing house. The remainder of the degraded Riverfront Area follows the edge of the perimeter gravel road behind the existing structures. Vegetation growth was observed within areas asserted by the applicant to be degraded Riverfront Area. These areas were along the westerly edge of the development where the perimeter roadway turns north back to the parking lot, and between the parking lot and Pine Brook. Although remnants of the gravel surfaces associated with the former nursery operations were observed within these areas, this gravel was not consistent with the dense, hard packed gravel of the parking area

[1] Page 4 of Superseding Order of Conditions Denial MassDEP File No. 002-1015; dated January 30, 2013
[2] Page 5 of Superseding Order of Conditions Denial MassDEP File No. 002-1015; dated January 30, 2013

and perimeter roadway. In consideration of the vegetative growth observed within areas referred to as degraded by Applicant, it is BETA's opinion that the areas west of the existing structures, and between the parking lot and Pine Brook are not degraded. Furthermore, it is BETA's opinion that the limit of the degraded Riverfront Area extends from flag DRA#38 to the southeast corner of the existing wood hut and follows the stone wall west along the back edge of the parking lot to flag DRA#46. Based upon our experience with Massachusetts Department of Environmental Protection (MassDEP) regarding the definition of degraded Riverfront Area, BETA recommends that the applicant provide the commission with additional information to document that the areas between the gravel roads and buildings are consistent with the definition of degraded.

STORMWATER MANAGEMENT REVIEW

The Project proposes to use a single infiltration basin at the far westerly edge of the development. The design as presented is preliminary, and there are no construction details provided. In addition, there is no information on the proposed structure which identifies the first-floor elevation, the use, footprint area, access walkways, patios, and other landscape features. Based upon the preliminary nature of the submission, BETA's comments will be limited to general comments regarding the direction and nature of the hydrologic/hydraulic analysis. Comments regarding specific compliance with the standards will be addressed in later revisions.

BETA personnel visited the Site on January 4, 2023, to assess existing conditions and analyze topography and evidence of flow patterns. Consideration was given to the observations made at this Site visit in the comments below.

G1. The date of the existing conditions survey conducted by Beals & Thomas, Inc. is needed. The limit of the gravel surface area depicted on the plan is not representative of the limit of vegetative cover as shown on the aerial imagery viewed on MassGIS. A significant area which is indicated on the plans as a gravel surface is now well vegetated. BETA recommends that the design engineer review the aerial imagery from 2021 and adjust the cover types and CN values used in the stormwater analysis accordingly.

G2. In addressing Standard 3 in the drainage report, the existing site is described as "various buildings, a large heavily compacted gravel lot, and a wooded area. The existing buildings and the gravel lot are functioning as impervious surfaces." Gravel surfaces are not defined as impervious surfaces in the standards. In addition, all of the gravel surfaces south of the parking lot are no longer heavily compacted and are covered by vegetation. CN values for these former gravel areas should be modified to reflect current conditions.

G3. The Hydro-CAD analysis assumes that the soils are all HSG B. However as noted in the drainage report, NRCS-WSS indicates that the soils are HSG A. Based upon the test pit logs and the percolation rates achieved by Onsite Engineering, it is BETA's opinion that the designation of the soils in the NRCS web soil survey as HSG A are correct. Additionally, the Scarboro soils adjacent to the brook are listed as HSG A/D. The HSG D designation should only be applied within the limits of the wetlands adjacent to the Pine Brook. Thus, all upland areas should be designated as HSG A in the analysis and CN values adjusted accordingly.

G4. The watershed area for the discharge culvert from the Route 20 outfall has been determined based solely upon the Route 20 pavement area only. BETA recommends that the design engineer

develop a watershed based upon contour mapping from aerial imagery and develop a complete analysis of the flows to be expected from this outfall.

G5. The narrative in the drainage report states that the site development is in accordance with the standards therefore the redevelopment standards are not applicable. However, in the calculations presented in Appendix D the discussion is only regarding the increase in impervious area. Revise the calculations accordingly to show that all the impervious surfaces onsite are considered. Gravel parking is not considered an impervious surface under the standards and should not be included in this total. The only impervious surfaces onsite are the roof areas and the brick and concrete walkways.

G6. If the intent is to design the Site as a redevelopment as shown on the checklist, then a redevelopment checklist is required.

G7. The stormwater checklist indicates the project as redevelopment. As previously noted, the gravel parking and access roadways are not considered impervious surfaces as defined in the standards. Therefore, the amount of impervious proposed is greater than the existing impervious and cannot be considered as solely redevelopment. Reduced impervious area is checked off as an LID Measure implemented which is not true since there is an actual increase in impervious on site.

G8. The checklist indicates that a portion of the runoff from impervious surfaces onsite does not discharge to an infiltration BMP. However, the watershed map indicates that there are no impervious surfaces within watershed PDA3 which is the only area that does not discharge through the infiltration basin. Indicate on the plans where the untreated surface inside this watershed is located and describe why it is not being treated.

G9. The test pits conducted by Onsite Engineering in 2016 do not provide the elevations at the surface; therefore, the groundwater elevation cannot be shown with certainty. BETA recommends that new test pits be conducted, and groundwater levels established.

G10. The results of TP-5 from Onsite Engineering indicates that there is 90" of fill where the proposed infiltration basin is located. There are no details regarding this fill and in accordance with Volume 2, Chapter 2 of the Stormwater Handbook, ***"6. Infiltration basins should not be placed over fill materials."***

G11. Test pits 3 & 4 by Onsite Engineering noted in Figure 1 of the drainage report indicate that Estimated Seasonal High Groundwater (ESHGW) is elevation 159.2±. These two test pits are each adjacent to the proposed entrance pond. The bottom of this pond is proposed at elevation 158.0, which is 1.2' in the groundwater. By exposing groundwater to this direct flow, the pollutant load associated with this discharge will directly impact ground water quality without treatment. BETA recommends that the basin either be moved west where groundwater levels are lower or eliminated.

G12. In accordance with Volume 2, Chapter 2 of the Stormwater Handbook, flow into the proposed infiltration basin will require 44% pretreatment for the infiltration basin to achieve 80% TSS Removal. The exception to this is the roof runoff which can be piped directly into the basin. As proposed, the pretreatment provided for the runoff from Route 20 and the west parking lot is not documented. Provide a description of the measures to be implemented and the design calculations which document that they are adequately sized in accordance with the Handbook.

G13. Provide TSS Removal calculation sheets for each of the treatment trains.

G14. There are soil logs in the drainage report for 12 shallow test pits conducted by Beals & Thomas on 12-22-2017 to determine the limit of the degraded Riverfront Area, however, the location for these pits is not identified on the existing conditions plans and should be provided.

G15. There are 2 test pits nos. 20 & 21 identified in the drainage report in the plan shown as Figure 1 from Onsite Engineering dated January 2017. Depth to Estimated Seasonal High Groundwater and estimated percolation rates are indicated in the figure however no logs have been provided. Both test pits are in the infiltration basin area and the logs are required to confirm the notes. In addition, if the depth to ESHGW as indicated is correct than the bottom of the infiltration basin is less than 2' above maximum groundwater and the design should be adjusted accordingly.

G16. The flow path for EDA 1A is 389'. The flow path for PDA-3 is 504'. The runoff from these two watersheds follows the same flow pattern. Since the flow paths are not impacted by the development, the Tc calculation for the existing conditions should not be less than proposed. Adjust the calculations accordingly.

G17. The calculation for PDA-2 describes all the pavement as unconnected however all the pavement is collected in the catch basins and is directly connected. Modify the description in the HYDRO-CAD analysis accordingly since it will impact the peak flow rates.

G18. There are not enough grades shown on the Grading Sheet (C-1.0) to show that the runoff from the pavement on the east side of the building will be collected by the basins.

G19. The calculations for PDA-3 do not account for the modified CN value associated with the patio or the emergency access roadway. The CN values associated with this use should be accounted for.

G20. There are no details provided for the proposed infiltration basin embankments. Provide a detail for this structure including crest width, material, gradient of side slopes, surface treatment, spillway design, and general material requirements.

G21. There is a 3' high check dam identified on the plan in the infiltration basin however, there is no explanation for its purpose. If the intent is to provide a sediment forebay for pretreatment, then the area inside the forebay cannot be used for exfiltration. Explain its purpose and intent and adjust the Hydro-CAD analysis accordingly.

G22. Based upon the plans, the proposed infiltration basin is located 34.3± feet from the adjacent wetlands. In accordance with Volume 1, Chapter 2 of the standards, infiltration structures should be a minimum of 50' from waters of the commonwealth. In addition, Item 6 of the Standards espoused in Volume 1, Chapter 1 of the Handbook, states:

> *"Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment''*

The discussion relative to compliance with this standard should be included in the narrative.

G23. In accordance with Volume 2, Chapter 2 of the Handbook, the infiltration basins require monitoring wells and emergency dewatering capability.

G24. Provide stone sizing calculations for each of the outfalls.

G25. In accordance with the Standards, the manufacturer should provide the calculations necessary to document that the proprietary filter will continue to provide the documented TSS removal when installed in-line.

G26. Sheet 5 of the drawing set entitled "Flood Zone Elevation Plan" displays the 100-year floodplain. The limits of the floodplain as shown appear to have been taken directly from the current FEMA FIS map. Included are 4 HEC-RAS stream sections with corresponding water surface elevations that match the elevations shown on the FEMA FIS map. There is no explanation provided in the drainage report or on the plan as to how the water surface elevations were determined. If the intent is to extend the FEMA detailed analysis past the Site and document actual flood elevations, then the HEC-RAS results and base assumptions should be presented.

G27. The "Project Site Owner's Manual", included with the Stormwater Management Report, is missing inspection requirements for catch basins.

G28. Maintenance requirements for the infiltration basin should reflect the requirements in Volume 2, Chapter 2 of the standards.

G29. The disturbance area will exceed 1.0 acre and the site is therefore subject to the EPA Construction General Permit. BETA recommends that the Storm Water Pollution Prevention Plan, which is required in conjunction with the EPA permit, be submitted to the commission for their review & approval.

G30. The illicit discharge statement should be signed by the Owner/Applicant

DEP Stormwater Standards

In consideration of the above comments, BETA will await the Applicant's responses prior to issuing final comments relative to compliance with the Standards.

Summary

Based on our review of the Project documents and plans, the Applicant has not provided the Wayland Conservation Commission with sufficient information to demonstrate compliance with the MassDEP Stormwater Management Standards, and generally accepted engineering practices. BETA does not recommend the issuance of permit approvals at the time.

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,
BETA Group, Inc.

Elyse Tripp
Staff Scientist

Gary D. James, P.E.
Senior Project Manager