September 06, 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
Stormwater Peer Review Update

To the Members of the Commission,

BETA Group, Inc. (BETA) has completed a stormwater management peer review based on supplemental materials received for the proposed 40B Development "Cascade Residential Housing Development" 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.

BASIS OF REVIEW

BETA received the following supplemental items via email:

- Letter entitled: ***Response to Peer Review Comments2***; prepared by LEC Environmental Consultants, Inc.; dated July 11, 2023. Inclusive of:
    - Plan Set entitled: ***Cascade Residential Housing Development, Boston Post Road, Wayland, Massachusetts, Middlesex County;*** prepared by C1.0 Engineering, LLC; dated November 14, 2022 and revised through June 30, 2023; stamped and signed by William Doyle, MA P.E. No. 41510; 13 sheets.
    - Report entitled ***"Post Construction Stormwater Management Report"*** prepared by C1.0 Engineering & Development, stamped and signed by William Doyle, MA P.E. No. 41510, dated June 30, 2023.
    - Letter to ***Tenzin Lama, Environmental Engineer, Massachusetts Department of Environmental Protection, Northeast Regional Office, dated July 12,2021 RE: Response to MassDEP Deficiencies and Errors for Groundwater Mounding Analysis of Proposed Subsurface Disposal System for the Cascade Development at 115 Boston Post Road, Wayland MA***. Prepared by Geosphere Environmental Management.

Hydrogeologic Report entitled **"*Revised Hydrogeologic Report: Groundwater Mounding analysis for Proposed Subsurface Disposal System*"** prepared by Geosphere Environmental Management, Inc. dated January 19, 2021, signed by Raymond W. Talkington, PhD., P.G., Principal Hydrogeologist.

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***

COMPILED REVIEW LETTER KEY

BETA reviewed this project previously and provided review comments in a letter to the Commission dated January 12, 2023, (*original comments in italics*). LEC Environmental Consultants (LEC) provided responses (responses in standard text) and BETA provided comments on the status of each (***status in bold italics***).

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 front and westerly edge of the development to avoid the riverfront area. The existing 20" outfall from the Route 20 stormwater collection system to Pine Brook will be removed and replaced with an 18" culvert that will be directed into a swale that will provide some treatment prior to discharge into the stream. The runoff from the easterly parking area will be collected into two (2) catch basins and piped through a sediment forebay in front of the proposed building. The runoff from the driveway entrance into the underground garage will be collected by a catch basin and directed through a separate sediment forebay just west of the entrance. Entrance. The proposed infiltration basin will be located at the far west side of the development. The

discharge from the basin will be directed east towards the proposed outfall swale associated with the Route 20 discharge channel. This basin will be the only infiltration SCM provided on site.

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. The hydrogeological report has been provided including a revised groundwater mounding analysis. The results show that the flow through the subsurface sewage effluent disposal system will cause a 5% increase in the groundwater flow into the stream within the zone analyzed from 10,101 cu. ft./ day to 10,592 cu. ft./day although the mound from the system did divert an additional 442 cu. ft./day from the north to the west which will ultimately flow to the stream. The test pits data shows that there is a thin vein of coarse sand & gravel on the site that sits over a dense silt layer. Thus, all the flow from the proposed subsurface disposal system will flow to the stream. The report only addresses the geohydrological impacts of the system on the groundwater regime in the limited area of the proposed system. As noted, the final treatment methodology and water quality goals for the effluent were not presented and are not necessary for the analysis provided.

The other important result from the report was the analysis of Estimated Seasonal High Groundwater. As reported, based upon the actual groundwater readings in the monitoring wells, ESHGW was above the redoximorphic features by in some instances over 2'. The impacts of the system on ESHGW levels have been considered in the stormwater 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 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.

BETA2: A significant explanation from LEC has been provided in response, and the limit of the degraded riverfront area corresponds to the limits as outlined in the field. However, it must be noted that on a recent project in Yarmouth after the site walk, DEP interpreted an area inside the outer riparian as non-degraded only on the basis that remnants of the former paved surface were not present. Although after 50 years there was still no vegetative cover present in this particular area. Based upon this interpretation, the only degraded riverfront area for this site, would be the building footprints. BETA will defer the final interpretation of the degraded riverfront area to the Commission.

[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

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 in nature. There is no information provided on the proposed structure. As a minimum the first-floor elevation, the use, and footprint area should be provided. Based upon BETA's earlier comments there are now sufficient construction details to provide comments regarding specific compliance with the standards. To reduce the size of the report, those comments from earlier reviews which have been addressed and/or are no longer relevant have been eliminated. There has now been 3 previous reviews and comments. The last review conducted by BETA was in response to an email inquiry by C1.0. The applicant has responded to both the June 5th report and the June 28th response to the email inquiry in their report to the Commission. Their response will be formatted by ***C1.0 7/11 Response:*** while the BETA response will be ***BETA3:***

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.

LEC: The report and calculations have been revised to account for the new vegetation.

BETA2: *BETA recommends that the CN Value for the vegetated former gravel area be converted to Fair condition.*

C1.0 7/11 Response: While vegetation has begun to establish within gravel areas since project permitting began, the CN has been changed to "Fair" condition to meet BETA Group's expectations.

BETA3: Comment Addressed.

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 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.

LEC: The Curve Numbers have been adjusted per discussions with Beta Group and the calculations have been revised.

BETA2*: See comment above.*

C1.0 7/11 Response: See response above.

BETA3: No further comments.

G3. 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.

LEC: The areas have been recalculated and the gravel emergency access drive has been calculated as gravel with permeability. The large patio at the rear of the project has been removed and will now be grass.

BETA2: *The stormwater report continues to state in the Standard 3 description that "There is an overall significant decrease in impervious surfaces from pre- to post- development conditions,", the impervious surfaces on site increase from the current 0.53 acres to 1.30 acres. Beta recommends that this language be modified accordingly.*
Provide manufacturer's information regarding the proposed grid in the construction detail shown on Sheet C.2 for the proposed emergency access driveway.

C1.0 7/11 Response: Text has been corrected and manufacturers information added.

BETA3: Comment addressed.

G8. 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.

LEC: The test pits and monitoring wells in the vicinity of the retention basin have been added to the plans and with their elevations. The test pit logs and monitoring well information have been added to the plan and the hydrogeologic analysis for the site has been provided, which includes all of the test pit, boring logs and groundwater analysis.

BETA2: *Figure 5 Simulated ESHGW Contours, prepared by GEOSPHERE and included in the drainage report shows that ESHGW where the proposed infiltration basin is located ranges from elevation 156-154. It is shown at OSE-TP 5 as elevation 155.0. The bottom of the proposed infiltration basin is Elevation 156.0. The design of the basin must be modified to meet the separation requirement from the ESHGW elevation.*

C1.0 7/11 Response: The bottom of the infiltration basin has been raised to elevation 158.

BETA3: Comment addressed.

G9. 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."

LEC: A note has been added to the plan to remove any fill material and replace with septic sand.

BETA2: *BETA Recommends that the construction detail for the basin be modified to include the limits of the proposed excavation and the material specifications for the replacement soil.*

C1.0 7/11 Response: The stormwater basin detail has been modified.

BETA3: Comment addressed, detail modified as requested.

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.

LEC: Separate Stormceptor units have been added to each of the parking lots and the Route 20 drain has been disconnected. Contech specified a Stormceptor 450i Catch Basin inlet for the west parking lot and a Stormceptor 1515-3-C inline unit for the east parking lot.

BETA2: *Based upon a report from the EPA, the proprietary separators are approximately 40% effective. (See Attached) BETA has normally allowed these units to be used primarily as pretreatment units which will provide the 44% TSS Removal required prior to the infiltration SCM. It is our opinion that using them exclusively for treatment should be reserved when they are needed to meet the MEP requirement for redevelopment (Standard 7). In this instance also, the design provides no treatment for the roof runoff.*

BETA 6/5 Comment: *Based upon a report from the EPA, the proprietary separators are approximately 40% effective. (See Attached) BETA has normally allowed these units to be used as pretreatment units which will provide the 44% TSS Removal required prior to the infiltration SCM. This is consistent with the requirements for discharges to Cold Water Fisheries as outlined in Volume 1 Chapter 1, page 20 of the Handbook, which states "For discharges near or to cold-water fisheries, proprietary BMPs may be used for pretreatment only, unless verified for such other uses by STEP or TARP. "Since the STEP and TARP program has been discontinued, It is our opinion that using them exclusively for treatment should be reserved when they are needed to meet the MEP requirement for redevelopment (Standard 7). In this instance also, the design provides no treatment for the roof runoff.*

C1.0 7/11 Response: Sediment forebays have been added to the two parking lot treatment trains. There are now two separate pretreatment systems from the parking lots that include deep sump catch basins sediment forebays, which provide 44% TSS removal from the respective parking lots prior to draining the infiltration basin. Both parking lot pretreatment systems drain to the infiltration basin for the total TSS removal efficiency of 89%. The roof drains tie into the drainage system after the pretreatment systems and drain to the infiltration basin without going through the pretreatment systems. TSS and WQV calculations are provided in Appendix D.

BETA3: The design as modified will provide the pretreatment needed for the infiltration basin to achieve the 80% TSS Removal rate. In addition, the design no longer depends upon proprietary separators for pretreatment. However, the total TSS removal rate provided is only 80$. The pretreatment cannot be included in the total removal rate determination.

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

LEC: The calculation sheets have been added to the drainage report.

***BETA2:** See comment G12 above.*

BETA 6/5 Comment: See comment G12 above.

C1.0 7/11 Response: See response to comment 12 above.

G14. 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.

LEC: Onsite Engineering Test Pits #20 and #21 are located on the eastern portion of the site at the location of the septic system. The hydrogeologic report contains those logs and locations.

***BETA2:** The hydrogeologic report cannot be located. As shown on Figure 2 from Geosphere, the 2 test pits are located in the area of the proposed leaching facilities for the sewage disposal system however the depth to groundwater indicated in the original plan does not seem to correlate to the actual conditions. Provide the logs.*

C1.0 7/11 Response: The original Figure #1 provided was a progress print and at that time Test Pits #20 and #21 had not been conducted. After that progress print, Test Pits #20 and #21 were conducted for the final hydrogeological report dated June 26, 2018 and approved by the MADEP, see attached. The hydrogeological report illustrates the "observed" existing conditions and the "modeled" proposed conditions with the infiltration/leaching systems.

BETA3: The Hydrogeological report has been included and the test pit locations have been addressed. No further comments.

G17. 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.

LEC: Grades have been adjusted and a note has been added that walk and parking lot drain to CB #302.

BETA2: The grades as shown are incorrect. The rim elevation for CB 302 is 175.3, which is higher than the grade as shown at elevation 174.5±. Comment remains.

C1.0 7/11 Response: The elevation has been corrected.

BETA3: The proposed rim elevation has been corrected to Elevation 174.30; however, the outlet pipe is a 12" HDPE culvert at invert elevation 173.0. Based upon the elevations, this structure cannot be built as shown. Based upon the inverts at DMH 351, it appears that the invert could be dropped to Elevation 172.27 which would provide the cover depth needed for the piping. This should be corrected.

G19. 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.

LEC: A detail has been added that illustrates the cross section of the basin embankment and the spillway.

***BETA2:** More dimensional detail is required to define this embankment including crest elevation, crest width, depth and limits of fill removal, replacement material specifications, and bottom material type and depth.*

C1.0 7/11 Response: Additional detail has been added to the plan.

BETA3: The detail does not match the plan view. In addition, the crest width of the embankment is not identified. Ideally, a width of 8' should be provided. Comment Remains.

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.

LEC: The retention basin is now located 107 feet from the stream. There are two outlets, one that drains west and one that drains to a newly created swale where the Route 20 drain pipe has been cut back about 110 feet to "daylight" the stream.

***BETA2:** By scale, the toe of the proposed embankment is 57± feet from the last wetland flag on the abutting lot is the nearest point to the abutting resource. See comment G12 above relative to the treatment level provided.*

***BETA 6/5 Comment:** By scale, the toe of the proposed embankment is 57+ feet from the last wetland flag on the abutting lot which is the nearest point to the abutting resource. See comment G12 above relative to the treatment level provided. It should also be noted that the connection of the outlet with the Route 20 Swale would be considered a direct discharge to an ORW. The applicant should expand their explanation of this issue to justify the connection.*

C1.0 7/11 Response: Additional explanation has been added to the Drainage Report narrative. Discharging the now treated Route 20 stormwater run-off directly to Pine Brook is required due to existing site topography. Instead of the existing condition, where untreated Route 20 stormwater discharges directly to Route 20 via a broken drainage pipe, stormwater from Route 20 will be directed to a treatment swale prior to discharge, thereby improving conditions for Pine Brook. The only viable alternative would be to retain the existing condition. The proposed drainage swale connection to Pine Brook will be achieved by excavating the land immediately behind the large stones and boulders that currently comprise the Pine Brook Bank, such that treated stormwater will flow through the spaces between the stones and boulders as it enters Pine Brook and the existing Bank will be

preserved. This work will be conducted under the supervision of a qualified Wetland Scientist during construction. A note to this effect has been added to Sheet C1.0 of the Revised Plan Set.

BETA3: In accordance with the Volume 1, Chapter 1, page 17, of the handbook,

> "The long-term pollution prevention strategies for sites near critical areas must also incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event***."***

The outlet configuration should be designed accordingly. As previously noted, this remains a direct discharge to a critical area and a waiver from the standards will be required and should be requested. NEC comments regarding this outfall should also be considered in this request.

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

LEC: Monitoring wells have been indicated on the plans and an emergency dewatering pipe has been added.

BETA2: *Move the monitoring well inside the basin.*

BETA 6/5 Comment: *Move the monitoring well inside the basin.*

C1.0 7/11 Response: Monitoring well has been located within the basin.

BETA3: Monitoring well shown on plans, comment addressed.

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

LEC: Catch basin inspections have been added.

BETA2: *Inspection requirements are 4x per year, not just the first year.*

C1.0 7/11 Response: Four times per year inspections have been added to the Project Site Owner's Manual.

BETA3: Comment addressed.

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.*

LEC: The National Pollution Discharge Elimination Systems, (NPDES) and Stormwater Pollution Prevention Plan, (SWPPP) are typically applied for by the site contractor, general contractor an owner prior to construction. A contractor has not been engaged at this time, typically the Conservation Commission makes this a Condition prior to commencing work on the site.

BETA2: *BETA will defer this to the Commission.*

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

LEC: Applicant has signed the drainage report on .pdf pages #8 and #120.

BETA2: Comment addressed.

Based upon the revised design, BETA has the following additional comments regarding the proposed stormwater design.

G31. There appears to be an issue with the datum. The grades depicted on the existing conditions plan are approximately 2.5' lower than the elevations BETA found with an RTK unit. This same differential is present in the FEMA cross sections also. BETA recommends that the applicant confirm the benchmark datum.

C1.02 7/11 Response: The survey plan with the FEMA Zone A flood line was developed by a registered professional land surveyor and is presumed correct and accurate. The Zone A FEMA cross section data was obtained from available record information by the design team and added to the plan as a graphic for general comparison only. Additionally, all work proposed within the BLSF results in a topographic cut with no fill proposed, thereby meeting the DEP performance standards for work within BLSF.

BETA3: The contours as shown on the plans correlate closely with the 2021 LIDAR presented in Massmapper. No further comments.

G32. The assumption that the Tc for EDA 2 is 6.0 minutes is not appropriate. The Tc should be the longest duration travel time not the longest distance.

C1.0 7/11 Response: The Tc has been calculated in the model.

BETA3: The initial sheet flow assumption is incorrect. The slope is exaggerated, and the surface conditions are a grassed surface. Comment remains.

G33. There is an existing isolated depression located on the far westerly edge of the parcel. Based upon the existing conditions topography, it appears that this depression will store approximately 15-18" of water before it reaches the crest of the berm that forms the pond at elevation 155.3. Nearly the entirety of the watershed flows into this ponding area. The existing condition analysis should be modified to include routing through this depression which will act like an infiltration basin prior to discharge into the brook.

C1.0 7/11 Response: The depression has been added to the model.

BETA3: Comment addressed.

G34. At the west edge of the principle building on the site, the existing grades direct runoff into the building entrance where there are 4 catch basins indicated. The designer should document where these basins flow to or whether they are infiltration structures. The existing conditions analysis should be modified accordingly.

C1.0 7/11 Response: The structures indicated on the survey are a single 24 x 48-inch entrance doorway threshold grate, the underground structure is constructed of solid block walls and is about 18-inches deep with an open bottom filled with silt. There is no outlet pipe. The stormwater model was revised to include the threshold grate assuming the bottom eight-

square feet provide infiltration; the model revealed that the structure does not provide significant stormwater mitigation; overflow stormwater in this area currently flows from east to west through the existing dilapidated greenhouse.

BETA3: Comment addressed.

G35. BETA recommends that the outlet from the Stormceptor 450i be combined with the outlet from DMH 352. This will effectively maximize the separation distance between the inlet and outlet in accordance with Volume 2, Chapter 2 of the handbook.

C1.0 7/11 Response: The outlets have been redesigned.

BETA3: Comment is no longer applicable based on the redesign.

G36. Inside the proposed infiltration basin, BETA recommends that the A horizon identified on OSE-TP5 be removed also. This will expose the better C1 horizon soils below and will allow the designer to increase the infiltration rate to 2.41 inches per hour.

C1.0 7/11 Response: The plan has been revised to direct the removal of soil to the C1 horizon and the infiltration rates have been adjusted to use 2.41 inch per hour.

BETA3: Plan revised, see G38 below.

G37. In the analysis for the proposed flow into the infiltration basin, the water surface in the basin should be assumed to be an impervious surface with a CN value of 98.

C1.0 7/11 Response: The surface area of the infiltration basin has been modified to CN 98.

BETA3: Comment addressed.

G38. The HYDRO-CAD calculations cannot be used to determine that the infiltration basin has been designed in compliance with Standards 3 & 4. Storage documentation in accordance with Volume 3, Chapter 1 should be provided in the report.

C1.0 7/11 Response: The calculations for infiltration volume and water quality volume based on the Volume #3 of the Handbook, are provided in Appendix D, these calculations have been revised with the adjustments to the drainage system and associated calculations.

BETA3: The Water Quality Volume is 1" of runoff from the impervious surfaces, which includes all roof area. The calculation is as follows.

Total Impervious Area = 43,788 sq. ft.
WQV = 1" = 43,788 (1/12") = 3,649 cu. ft.
Static Volume Provided = 2,688 cu. ft.

The basin does not provide the WQV capacity required by the standards. The following issues with the basin design should also be addressed, which include:

- ***In accordance with Volume 3, Chapter 1, page 28 of the handbook:***
  Mounding analysis is required when the vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four (4) feet *and* the recharge system is proposed to attenuate the peak discharge from a 10-year or

higher 24-hour storm (e.g., 10-year, 25-year, 50-year, or 100-year 24-hour storm).

A mounding analysis was not included in the report.

- ***The emergency spillway has been incorporated into the normal discharge from the basin in events as low as a 2-year storm. BETA recommends that the design of the outlet control structure be modified to provide the combined discharge capacity and a true emergency spillway be provided above the 100-year water surface elevation.***
- ***The infiltration rate used in the analysis is 1.02 inches/hour. In accordance with the handbook, the design rate based on the C horizon soils would be 2.41 in/hr. BETA recommends that the design analysis be revised to reflect this rate since it may help with the design modification needed to address the above comment.***
- ***As discussed at the last hearing, the Commission is concerned about temperature issues associated with the discharge from the basin. BETA recommends that the design be modified to provide a temperature sink to cool the water prior to discharge. The State of Maine stormwater standards have recommendations for designs which could be implemented to achieve this goal.***
- ***The TSS removal calculations are incorrect. The pretreatment is required for the infiltration basin to achieve the 80% Removal Rate quoted. Therefore, the pretreatment rate cannot be used in determining the total TSS removal provided by the train. The actual Removal rate provide is only 80%, not the 89% reported. The sheets should be corrected.***
- ***Provide the sizing requirements for the sediment forebay and document that they provide the volume required in accordance with the handbook.***

G39. The proposed discharge channel from the Route 20 outfall should be moved upstream away from the existing culvert to avoid any potential damage to the culvert that may arise from the installation. In addition, the contours at the outlet adjacent to the stream are incorrect. BETA recommends that the designer look at the potential to continue the existing stonewalls across this discharge point to minimize the impact on the stream bank.

C1.0 7/11 Response: The proposed drainage swale has been adjusted to enter Pine Brook further upstream to minimize the potential for impacts to the stone walls associated with the existing bridge crossing the Pine Brook. Under existing conditions, the Pine Brook Bank is entirely comprised of large stones and boulders. These large stones and boulders will remain in place, and the land immediately behind the Bank will be excavated to accommodate the proposed drainage swale. Accordingly, treated Route 20 run-off will flow through the spaces between the stones and boulders along the Bank to Pine Brook, and the existing Bank to Pine Brook will be preserved. This work will be conducted under the supervision of a qualified Wetland Scientist during construction. A note to this effect has been added to Sheet C1.0 of the Revised Plan Set.

BETA3: The swale as proposed will maintain the existing stones on the bank of the stream. No further comments.

G40. Southwest of the outfall from the basin, the proposed grading along the outside of the embankment results in approximately 2,500 square feet of additional disturbance within the inner riparian zone. BETA recommends that the designer review this grading and reduce the disturbed area accordingly.

C1.0 7/11 Response: The plan has been revised to include low landscape walls to keep the grading outside of the 100-foot inner riparian zone. Please recall that this entire area is Previously Developed and that the Riverfront Area functions and values will improve via the restoration and enhancement efforts specified in the mitigation planting plan prepared by LEC.

BETA3: Comment addressed.

DEP Stormwater Standards

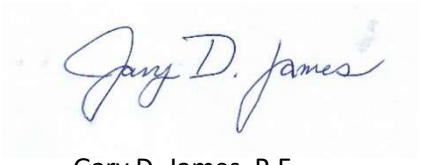
In consideration of the above comments, BETA will await the Applicant's responses prior to issuing final comments relative to compliance with the Standards.

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 currently.

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

Very truly yours,
BETA Group, Inc.



Gary D. James, P.E.
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