Memorandum

To: Planning Board
Town of Winchester
71 Mt. Vernon Street
Winchester, MA 01890

Date: November 29, 2021

Project #: 15516.00

From: Luke Boucher, PE
Jake San Antonio, PE

Re: 10 Converse Place Special Permit/Site Plan Review Application – Stormwater and Drainage Peer Review

---

At the request of The Town of Winchester Planning Board (the Client), Vanasse Hangen Brustlin, Inc ("VHB") conducted a peer review of stormwater and drainage components of the Center Business District (CBD) Special Permit and Site Plan Review Application package submitted by Beals Associates, Inc. (the Applicant). The materials were prepared in order to obtain Planning Board approval for a proposed Mixed-Use Development (the Project) at 10 Converse Place in Winchester, Massachusetts (the Site). VHB's review evaluated the project's compliance with the Massachusetts Wetlands Protection Act (WPA) and its implementing regulations, the Winchester Wetlands Bylaw (the Bylaw), and standard industry practice.

Specific documents were provided to VHB for review and comment and include the following:

1. Stormwater Management Report dated August 2021, prepared by Beals Associates, Inc.,
2. Site Plans for the Project dated August 10, 2021, prepared by Beals Associates, Inc., consisting of 14 plan sheets,

Site and Project Description

The site is located within the Center Business District (CBD). The Site currently consists of a four-story office building and an associated parking area. The southern and eastern portions of the Site are located in the 1% annual chance Floodplain (FEMA Zone AE) and Regulatory Floodway associated with the Aberjona River. Surface water drainage within the site and vicinity is tributary to Mill Pond of the Aberjona River via overland sheet flow or via the municipal closed drainage system. The Project proposes to demolish the existing office building and parking area and construct a five-story mixed-use building, at-grade landscaped and patio areas, and associated below grade parking.

Findings

FEMA 100-Year Floodplain and Regulatory Floodway

1. Sheet 03P and Table 12 from the effective FEMA Flood Insurance Study, dated July 6, 2016 and Sheet 003P and Table 23 from the preliminary FEMA Flood Insurance Study, dated August 13, 2021 both indicate a 100-year FEMA Floodplain elevation (Zone AE) of 19.9 Feet NAVD 88. Per the notes on Sheet 3 of the planset, the Floodplain and Regulatory Floodway line indicated on the plans is shown graphically based on the FEMA Flood Insurance Rate Map (FIRM) instead of based on elevation. As a result, the ZoneX/Zone AE floodplain delineation line ranges from elevations 19 to 21 based on the existing conditions contours. As proposed work and grading are proposed in close proximity to these elevations, VHB recommends that the Applicant revise the floodplain extents on the project site based on the effective floodplain elevations to demonstrate that the proposed work does not encroach into the 100-year FEMA Floodplain elevation or Regulatory Floodway.

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Memorandum

2. While nearly all the proposed work is located above the 100-year FEMA Floodplain elevation (19.9 Feet NAVD88) and Regulatory Floodway, the proposed elevation 20 contour located north of WF-13 and WF-14 along the south side of the Site indicates a small amount of fill within the 100-year FEMA Floodplain elevation and Regulatory Floodway. VHB recommends revising the grading in this area to eliminate the proposed modification to the elevation 20 contour.

Stormwater Management Report

3. The Pre-Development Watershed Map indicates that the existing building discharges to Point of Analysis (POA) #2, Mill Pond. The building appears to have a flat roof with internal roof drains; however, the discharge location of these roof drains is not indicated on the plans. The Applicant should provide information on the existing roof drain system to confirm that it is tributary to POA #2 and does not discharge into the municipal closed drainage system on Converse Place.

4. The Pre-Development HydroCAD model utilizes a timespan of 5 to 20 hours. As a result, the surface runoff volumes reported in the tables on page 6 may be underestimating total runoff volumes generated for the entire storm duration because they are excluding volumes in the beginning and end of the event. As an increase in the pre-development volumes would not result in any required changes to the design of the post-development stormwater system, it is VHB's opinion that no change is required.

5. The Stormwater Management Report indicates that the project is considered a redevelopment project for the purposes of Standard 7 of the Massachusetts Stormwater Standards, but that the project has been designed to meet all of the Massachusetts Stormwater Standards. As the project results in an increase in impervious area (from 59.1% impervious under pre-development conditions to 85.8% impervious under post-development conditions), the project is not considered a redevelopment. As a result, the Applicant should revise the narrative and DEP Checklist for Stormwater Report accordingly.

6. Under Standard 3 – Stormwater Recharge, the Capture Area Adjustment calculation appears to be incorrect. Instead of increasing the required recharge volume, the calculation is showing that the adjustment is reducing the required recharge volume. In addition, it appears that the incorrect value for the pre-adjusted value is used in the calculation. The Applicant should revise the calculations and all associated calculations accordingly.

7. Under Standard 4 – Water Quality, the Applicant indicates that the 80% TSS removal requirement is satisfied through the 80% TSS removal associated with the subsurface infiltration system. This methodology does not account for the 4,226 sf of on-site impervious area, which is approximately 19% of the total on-site impervious area. The Applicant should provide calculations demonstrating that 80% TSS removal is achieved for the entire site. The Town's Engineering Department has indicated that it is acceptable to use a composite TSS removal rate that credits overtreatment in some areas (i.e. the subsurface infiltration system) to account for less than 80% TSS

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Memorandum

removal in others. We respectfully defer to the Conservation Commission for a determination on the acceptability of this approach.

8. As the project is located within soils with rapid infiltration rates, 44% TSS removal pretreatment is required, and the 1.0-inch water quality volume applies. The Applicant should revise the calculations to demonstrate compliance with this requirement.

9. Seasonal high groundwater is based on measurements from observation wells monitored in late October 2019, as indicated in the Preliminary Geotechnical Engineering Report prepared by McPhail Associates, LLC. As stated in this report, "It is anticipated that future groundwater conditions across the site may vary from those reported herein due to factors such as normal seasonal changes, periods of heavy precipitation, and alterations to existing drainage patterns." The groundwater table is typically lower during this time of year than during the spring months. Per Vol. 3, Ch. 1 of the Massachusetts Stormwater Handbook, "Depth to seasonal high groundwater may be identified based on redox features in the soil (see Fletcher and Venneman listed in References). When redox features are not available, installation of temporary push point wells or piezometers should be considered. Ideally, such wells should be monitored in the spring when groundwater is highest, and results compared to nearby groundwater wells monitored by the USGS to estimate whether regional groundwater is below normal, normal or above normal (see: http://ma.water.usgs.gov)". The Applicant states that additional test pits were performed in August 2021; however, test pit logs associated with these test pits were not submitted. The Applicant should submit the test pit logs to support their use of the selected ESHGW elevation or provide a calculation for an adjusted groundwater elevation based on the above.

10. The LID Measures section of the DEP Checklist for Stormwater Report indicates that the project will not result in disturbance to any Wetland Resource Area; however, it appears that the proposed riprap at the outfall into Mill Pond extends into Bank and Land Under Water. The Applicant should either revise the design to eliminate this encroachment into resource areas or should revise the checklist accordingly.

11. The Standard 1 section of the DEP Checklist for Stormwater Report indicates that outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth and that supporting calculations are included; however, these calculations do not appear to be included in the report. The Applicant should provide these calculations.

12. The Standard 4 section of the DEP Checklist for Stormwater Report indicates that the project is subject to a TMDL; however, no discussion is included in the narrative. The Applicant should revise the report to include discussion on compliance with any TMDLs.

13. Section 0. Of the Operation and Maintenance Control Plan describes the 648-654 Main Street Project. The Applicant should revise this section to reflect the current project.

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Memorandum

14. The Applicant should revise Figure O&M 1: Operation and Maintenance Plan to indicate the locations of the proposed area drains and riprap apron.

15. Section 5.2 of the Operation and Maintenance Control Plan indicates that "If upon visual inspection it is found that sediment has accumulated to an average depth exceeding six (6) inches, the system should be back-flushed." If this depth of sediment is observed in the system, it likely means that the majority of the crushed stone layer underlying the infiltration systems is fouled with sediment, preventing infiltration through the bottom of the system. Backflushing the system will likely only redistribute sediment throughout the crushed stone layer. As requested on the 648-654 Main Street project, the Applicant should revise the O&M Plan to describe the backflushing procedure in greater detail. If the Applicant's intention is to discharge water from back-flushing operations into the municipal closed drainage system, VHB recommends including language similar to the following:

    Maintenance of the subsurface infiltration systems may be required should the infiltrative capacity of the system become reduced significantly beyond the design values. The R-Tank Systems should be back-flushed once sediment accumulation has reached 6" or 15% of the total system height. Back-flushing shall be done in accordance with the manufacturer's recommendation. Prior to any back-flushing the owner shall notify the Town's Department of Public Works and Town Engineer at least 7 days prior to the scheduled maintenance.

    The back-flushing of the system may require discharging sediment laden water from the systems. The sediment laden water must be captured for disposal, pumped through a Dirtbag or similar device, or sediment must be removed from the stormwater through another means prior to discharge into the Town's municipal drainage system. A Street Opening Permit will be required for the discharge and the Owner must coordinate with the Engineering Department and Conservation Commission prior to the work.

16. VHB agrees with the statement made in Section 5.2 of the Operation and Maintenance Control Plan, which reads *"The key component to ensuring the long-term performance of the system is to remain diligent about the maintenance of the stormwater BMP's located upstream of the infiltration system, in this case the area drains and roof leaders. Ensuring these upstream units function as intended will help to eliminate the inflow of debris and sediment into the infiltration system."* To minimize risk for sediment to enter the system, VHB recommends that the Applicant consider providing additional treatment at the area drains.

17. In accordance with the Drainage Design Standards included in Section 2.0 of the Winchester Checklist of Items for Notice of Intent Filings, the calculations indicate that the proposed stormwater management system has been sized to reduce peak runoff rates and total runoff volumes under post-development conditions for the 2-, 10-, 25-, and 100-yr storm events.

18. The Groundwater Mounding Calculation included in the Stormwater Management Report uses a value of 148.00 for the horizontal hydraulic conductivity. Per the notes included in the USGS calculation used by the Applicant, the

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Memorandum

horizontal hydraulic conductivity is typically assumed to be 10x the vertical hydraulic conductivity. Given the 2.41 in/hr value assumed for vertical hydraulic conductivity elsewhere in the report, a value of approximately 48 would be anticipated. While the value used in the calculation is consistent with the table provided on page 133 of the report, the Applicant should provide documentation for this assumption.

Site Plans

19. The existing conditions plan indicates that the catch basin in the parking lot is full of water and that the discharge location of the pipe is unknown. While a discharge pipe was not observed during VHB's visual inspection of the slope adjacent to Mill Pond, it is possible that such a pipe exists. VHB recommends that the catch basin be cleaned and the Applicant determine the discharge location, either through visual inspection and/or through research of plans for the previous development. If the existing catch basin discharges directly to Mill Pond, the Applicant may have an opportunity to connect the proposed discharge from the subsurface infiltration system into the existing pipe, which could eliminate the need for work within the Regulated Floodway, Bank, and Land Under Water.

20. The Applicant should consider the potential for stormwater to travel in the pipe bedding material at the discharge pipe from the subsurface infiltration system. VHB recommends that the Applicant add an anti-seep collar on this discharge pipe to ensure the system functions as intended. An anti-seep collar detail is already included on Sheet C6.2.

21. The R-Tank Infiltration System Detail on Sheet C6.1 appears to indicate that the material above the system is different than the material on the sides and below the system. The HydroCAD model and callouts on Sheet C3.0 indicate that 12 inches of crushed stone is proposed over the system chambers. The Applicant should provide documentation that the crushed stone meets the top backfill requirements indicated in the detail.

22. While the "R-Tank" subsurface infiltration/detention systems appear to be proposed in only non-vehicular areas, subject only to pedestrian traffic, proper installation and backfilling of these systems will still be critical to retaining their structural integrity. Particular care should be paid regarding the overlapping and securing of the geotextile fabric surrounding each system and the placement of GeoGrid above the system. We respectfully recommend that the Planning Board require the design engineer or manufacturer be present on-site during the installation of these systems and provide written affidavit certifying that the installation was performed in accordance with manufacturer's requirements.

23. Sheet C2.0. indicates that permeable pavers are proposed in Converse Place. The detail on Sheet C6.0 indicates that the drainage system of the permeable pavement system should be designed to accommodate expected infiltration rates, storage capacities, outlet flow rates, and other site specific conditions" and that the "subgrade should be sloped to aid in drainage." The Applicant should provide additional information on how this system will function, including whether or not existing inlet structures along Converse Place will be retained and where water in the reservoir layer will discharge if it is unable to infiltrate through the underlaying geotextile fabric and compacted subgrade.

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Memorandum

As requested by the Town of Winchester, VHB reviewed the CBD Special Permit and Site Plan Review Application package. VHB trusts the information provided above satisfactorily fulfills and addresses the Town's request for peer review of the stormwater and floodplain portions of the design. Please direct any questions or comments to Luke Boucher.

References

Web Soil Survey. 2020. U.S. Department of Agriculture – Natural Resources Conservation Service. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Massachusetts Department of Environmental Protection (Mass DEP). 2008. Massachusetts Stormwater Handbook https://www.mass.gov/guides/massachusetts-stormwater-handbook-and-stormwater-standards

Town of Winchester, MA. Winchester Wetlands Bylaw (Chapter 13 of Winchester Code of Bylaws). https://www.winchester.us/DocumentCenter/View/107/Winchester-Wetlands-Bylaw-PDF

Winchester Conservation Commission. 2011. Winchester Checklist of Items for Notice of Intent Filings. https://www.winchester.us/DocumentCenter/View/102/Winchester-Notice-of-Intent-Filings-PDF

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770