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FEBRUARY 13, 2024

Town of Arlington Conservation Commission
c/o Mr. Ryan Clapp, Conservation Administrator
Robbins Memorial Town Hall
730 Massachusetts Avenue
Arlington, Massachusetts 02476

RE: Response to Additional Peer Review Comments, Hatch Engineering Thorndike Place Stormwater Peer Review

Dear Members of the Arlington Conservation Commission,

On behalf of the Applicant, Arlington Land Realty, LLC, BSC Group, Inc. (BSC) is pleased to submit this response to peer review comments provided by Hatch Associates Consultants, Inc. (Hatch) relative to the Thorndike Place residential development (the Project) to be located off of Dorothy Road in the Town of Arlington. Hatch has performed a peer review of the Project's stormwater management design pursuant to the Wetlands Protection Act on behalf of the Arlington Conservation Commission and issued comments in a memorandum dated February 7, 2024, titled *Town of Arlington, Thorndike Place Stormwater Review*. For clarity, we have repeated the original comments from Hatch's original peer review letter January 23, 2024, in standard text below utilizing the same numbering system, provided our previous response from a letter dated January 24, 2024, in *italics,* restated Hatch's updated February 7, 2024 comment in standard text with date, and, finally, provided final response where required in *italics with date*.

2.1 General Findings

- The applicant proposes to develop a 17.7-acre parcel, disturbing 4.02 acres and create 1.81 acres of impervious surfacing, leaving the remainder of the parcel under a Conservation Restriction (approximately 12 acres).

  No response required.

- 5 infiltration systems, one infiltration chamber, and one bioretention basin/rainwater garden are proposed to provide stormwater treatment/management.

  No response required.

- Alewife Brook runs through the southeast corner of this property. The Alewife Brook corridor includes wetlands, Bordering Lands Subject to Flood, Buffer Zone to Bordering Vegetated Wetlands, and FEMA floodplain/floodway.

  Alewife Brook is not located on the property, but rather approximately 800-feet southeast of the property. The wetlands at the southeast corner of the property are hydraulically connected to the Little River/Alewife Brook via three culverts that run underneath Route 2.

  [Hatch response; February 7, 2024] Noted, no additional action required.

  BSC February 13, 2024: No response required.

2.2 Standard 1: Untreated Discharges

- Stormwater runoff from the eastern portion of the senior living building (approximately 14,800 square feet) is directed to a rip-rap apron that drains to a nearby wetland. The applicant should verify discharge from this roof, during extreme events, will not cause erosion and sedimentation into the wetland.

  This rip-rap apron has been sized to accommodate the peak flow associated with the 100-year storm from the outlet pipe for this portion of the roof runoff, such that there will be no erosion or scour. Please see Section 6.04 of the Stormwater Report for the rip-rap apron sizing calculations and Sheet C-202 for the detail of Flared End Section w/Stone Protection (Dissipation Bowl). For reference, the roof drain in question utilized flared end FES2.

  [Hatch response; February 7, 2024] Based on conversation on February 6, 2024 facilitated by Chuck Tirone between the BSC Group and Hatch, the BSC group will verify that there is not erosion caused by runoff after it has discharged from the riprap apron.

  BSC February 13, 2024: BSC has modeled the rip-rap outlet protection at this location in HydroCAD. As shown in the attached calculations, discharge from this outlet protection in the 100-year storm event will be at a velocity of 1.71 feet per second (fps). This velocity for the largest storm event analyzed is non-erosive for the vegetated areas downstream of the outlet protection.

2.3 Standard 2: Peak Rate Control and Flood Prevention

- Surficial fill soils were designated as Hydrologic Soil Group C, and infiltration rates (0.52 inches/hour) were selected to be on the edge of published values for HSG C those soils, based varying composition of sandy loam, fine sandy loam and gravelly sandy loam.

  No response required.

- FEMA Technical Bulletin 6-93, Below-Grade Parking Requirements for Buildings Located in Special Flood Hazard Areas, clarified FEMA's policy that below grade parking is consistent with their definition of a basement, and that construction of the lowest floor (including basements) below the base flood elevation is prohibited for residential buildings. The FEMA base flood elevation "100-year" is 6.8-feet. As the building is proposed to be used for senior living residences and the proposed floodplain is adjacent to the structure, the proposed underground garage with elevation of 6.0-feet is below the base flood elevation (plus applicable freeboard and floodway surcharge requirements). Therefore, the proposed garage has a significant flood risk, as identified by FEMA.

  While the FEMA Technical Bulletin is not specifically applicable to a review under the Wetlands Protection Act and MassDEP's Stormwater Standards, it prohibits "the construction of below-grade parking garages…beneath residential buildings in Zones A1-A30, AE, and AH." Construction of the senior living building includes filling in the portions of the flood plain and, ultimately, altering its limits. The building will be constructed such that it is entirely outside the limits of the 6.8-foot base flood elevation (BFE). Therefore, construction of a garage beneath this building is allowed. A FEMA Elevation Certificate will be prepared for all buildings at the conclusion of construction demonstrating that all buildings are located above BFE. In addition, all below-grade areas in all buildings will be appropriately waterproofed to prevent groundwater intrusion.

  [Hatch response; February 7, 2024] The scope of this review was for all facets of stormwater management. Our accepted proposal states that we will review the project based on industry best practices, Wetland Protection Act, and the Massachusetts Stormwater Handbook. Specifically, our accepted proposal also states that we will complete a review as to the Code of Federal Regulations in regards to the floodplain and that will review the FEMA Floodplain/floodway encroachments as well as CLOMR/LOMR/no-rise documents. Further, the Mass.gov webpage lists the Massachusetts Wetland Protection Act as one regulation and practice that is part of floodplain management. As the Town of Arlington participates in the National Flood Insurance Program, it therefore must abide by the applicable rules and regulations stemming from CFR 60.3.

Based on conversation on February 6, 2024 facilitated by Chuck Tirone between the BSC Group and Hatch, fill is being used to raise the existing structure and separate it from the FEMA floodplain .FEMA NFIP Technical Bulletin 10, published in March 2023, "Reasonably Safe from Flooding Requirement for Building on Filled Land" provides guidance on this topic. Our understanding is that the use of any type of fill to remove a building from the Special Flood Hazard Area (SFHA) requires the LOMR-F, instead of a FEMA Elevation Certificate. Further, our understanding is that FEMAs requires the removal of the land from the SFHA before a basement, excavated into fill, is built below the base flood elevation using a LOMR-F process. It is our understanding that the FEMA then also requires a technical analysis showing the basement (garage) is reasonably safe from flooding and the Town of Arlington's designated local floodplain administrator to sign FEMA's Community Acknowledgement Form. The Town of Arlington's continued participation in the National Flood Insurance Program, with the significant benefit of subsidized flood insurance to its residents, requires it to comply with federal standards.

BSC February 13, 2024: The project will comply with all FEMA requirements. If a LOMR-F is required per FEMA regulations, one will be submitted in accordance with all applicable requirements. As previously stated, these requirements are not applicable to review and permitting under the Wetlands Protection Act. As such, the Hatch comment is noted and will be addressed with the appropriate permitting entities.

- The proposed basement elevations of the townhomes (elevation 3.0-feet) are 3.8-feet below the FEMA 100-year flood elevation of 6.8-feet. The proposed separation between these structures appears to be as little as 115-feet. A groundwater mounding analysis of the regional flood along Alewife Brook should be assessed to verify that groundwater intrusion from flooding along the watercourse does not impact the basements of the townhome structures. Note that this is distinct from the completed groundwater mounding analysis of the infiltration basins.

  A mounding analysis of the regional flood along Alewife Brook is not a requirement under the Wetlands Protection Act and potential basement groundwater intrusion does not fall under the WPA jurisdiction. Additionally, as referenced in our response above, the proposed site work will result in all buildings being located outside the FEMA 100-year BFE and below-grade areas in all buildings will be appropriately waterproofed to prevent groundwater intrusion.

  [Hatch response; February 7, 2024] This is a preference comment and can be considered closed.

  BSC February 13, 2024: No response required.

- Proposed ACF R-Tank^{XD}'s between the townhome units are nearly adjacent to the foundations of these structures with basements. The bottom of the chambers of these units are proposed to be at 6.0-feet (with bottom of stone at 5.67-feet), with the basement elevation of the adjacent townhomes at 3.0-feet. When these basins are filled with stormwater runoff, seepage will likely occur adjacent to the basement foundation wall, which will act as a preferential flow path (planar surface) with least resistance downward. Groundwater intrusion flood risk and seepage from these infiltration systems represents a concerning flood risk.

  See previous response to comments regarding waterproofing of buildings.

  [Hatch response; February 7, 2024] No further action, the comment may be considered closed. Additional discussion on separation between groundwater elevation and basements is included in the subsequent bullet.

  BSC February 13, 2024: No response required.

- Test Pit #1 (2023), located at the proposed ACF R-Tank^{XD} between the westernmost two townhome units, measured a point-in-time groundwater elevation of 1.5-feet, while the proposed basement elevations are at 3.0-feet. The Town of Arlington Zoning Bylaws Section 5.6.8.A (2) state that for sites within an Inland Wetland District, at least 4.0-feet of separation should be provided between the floor of the occupied levels and the seasonal high-water table.

As mentioned in previous comments, the basements of the buildings will be waterproofed to prevent intrusion of groundwater. We also note that project was reviewed and permitted as to local regulations in effect at the date of submittal of the Comprehensive Permit application. This comment references a more recent version of the Zoning Bylaws, and further is not relevant to the stormwater review under the Wetlands Protection Act.

[Hatch response; February 7, 2024] Based on conversation on February 6, 2024 facilitated by Chuck Tirone between the BSC Group and Hatch, we understand that the Comprehensive Permit application was completed and the basement elevations approved prior to this stormwater peer review. The comment may be considered closed.

As a best practice, FEMA advises against construction of basements below the FEMA flood elevation (see Technical Bulletin #10 above) and established groundwater tables as these structures may be prone to damage by hydrostatic pressures and/or groundwater seepage. and note that construction.

A point of clarification, during the site visit, Hatch staff were informed that groundwater elevations were based on readings from "monitoring locations". We now understand that the groundwater elevations are based on redox methods. As the margin for error is so close between the groundwater elevations and 1. The basement elevations and the seasonal high groundwater table and 2. The required separation between the infiltration feature bottoms and the seasonal high groundwater table, it is incumbent on the Hatch team to thoroughly review the established groundwater elevations as well as any discrepancies.

BSC February 13, 2024: Design of basements and applicable waterproofing systems will be performed during the final building design of the townhouses and submitted with building permit plans per standard industry practices. As previously stated, these requirements are not applicable to review and permitting under the Wetlands Protection Act. As such, the Hatch comment is noted and will be addressed with the appropriate permitting entities.

- Test Pits #2 and #4 pose similar challenges between the proposed basement elevation (3.0 feet) and insufficient separation to the groundwater table, located at 0.8 and 1.5-feet, respectively.

  See response to above comments.

  [Hatch response; February 7, 2024] No further action, the comment may be considered closed. Additional discussion on separation between groundwater elevation and basements is included in the previous bullet.

  BSC February 13, 2024: No response required.

- Test Pits #3 and #5 (2023) measured point-in-time groundwater elevations (3.5 and 4.0-feet, respectively) above the proposed basement elevations of adjacent townhomes (3.0-feet).

  See response to above comments.

  [Hatch response; February 7, 2024] No further action, the comment may be considered closed. Additional discussion on separation between groundwater elevation and basements is included in the bullet two above.

  BSC February 13, 2024: No response required.

- Note that the seasonal high groundwater table may be higher than the 2023 point-in-time measurements and increase flood risk. Additionally, construction of a sump pump system, to mitigate flooding/groundwater intrusion, at any of these residences could lower the regional groundwater table.

  See response to above comments regarding waterproofing of basement areas. Use of or need for sump pumps has not yet been determined. Should sump pumps be proposed, they will be included in final plans and building permit plans submitted in accordance with the Comprehensive Permit for the Project.

  [Hatch response; February 7, 2024] No further action. Comment may be considered closed.

  BSC February 13, 2024: No response required.

2.4 Standard 3: Recharge to Ground Water

- Test Pits #7 and #8 (2023) measured point-in-time groundwater elevations of 0.5 and 2.2, respectively. These test pits lie beneath the proposed Stormtrap infiltration system with a proposed bottom elevation of 6.0-feet. Massachusetts Stormwater guidelines state that at least two feet of separation shall be provided between the *seasonal high groundwater elevation* and the bottom of an infiltration structure. Based on our understanding from the site visit, the 2023 groundwater elevations were collected in May. We recommend collection of additional groundwater information, especially during the spring, to verify this standard is met.

  The highest estimated groundwater elevation on site was found to be 3.98 and was based on the highest observed redoxomorphic features in the soil, which were found in Test Pit #5. All infiltration systems on site were designed with a bottom elevation of 6.0 to provide a minimum of 2-feet of separation to this estimated seasonal high groundwater elevation (ESHGW). The test pits were conducted in Spring (May) of 2023 in coordination with the Town of Arlington Engineering and Conservation Departments and accepted practice under the Wetlands Protection Act, and consistent with the groundwater testing window set out within the Comprehensive Permit. It has been confirmed from USGS that streamflow conditions were within the normal range and that there were not drought conditions in this area at that time. Test pit logs and groundwater elevations can be found in the Stormwater Report. Locations of test pits are shown on the Site Grading and Drainage Plan.

  [Hatch response; February 7, 2024] The groundwater of the Stormtrap ST1 infiltration device should be reviewed. Based on simplified methods, Hatch expects approximately 2-3 feet of groundwater mounding beneath this basin for the design storms.

  BSC February 13, 2024: It is unclear exactly how Hatch has determined their groundwater mounding estimates or what is meant by "simplified methods". As part of the Stormwater Report, BSC performed a groundwater mounding analysis using the Hantush Method, which is the only methodology specifically referenced in the DEP Stormwater Handbook (see Volume 3, Chapter 1, Mounding Analysis). The mounding analysis was performed to demonstrate that the groundwater mound resulting from the required recharge volume does not break out above the land or water surface of a wetland as required. It should also be noted that the methodology used in our analysis is the exact same as was used during the Comprehensive Permit process and extensively peer reviewed and accepted by BETA Group working on behalf of the Town of Arlington.

- Additional comments regarding groundwater connectivity, infiltration, and recharge can be found in the section of this review on Standard 2.

  No response required.

2.5 Standard 4: 80% TSS Removal

- Point-in-time groundwater measurements were provided for review and incorporated into the design to provide at least 2-feet of separation between the bottom of the infiltration structure and the ground water table. The applicant should provide and review the seasonal high groundwater elevation, as is required by the Massachusetts Stormwater Handbook, to determine if adequate separation between the groundwater table and the structures is available.

  Please see above comments relating to the determination of the estimated seasonal high groundwater elevation and the elevations that were used for the infiltration systems. The Massachusetts Stormwater Handbook notes in Volume 3, Chapter 1 that "Depth to seasonal high groundwater may be identified based on redox features in the soil." Where redox features were found to be higher than the observed groundwater in the test pit, the elevation of the redox features was taken to be the estimated seasonal high groundwater elevation to ensure that suitable separation to infiltration practices was provided. Test pit logs and groundwater elevations can be found in the Stormwater Report.

[Hatch response; February 7, 2024] No further comment, this comment may be considered closed. Additional discussion regarding the type of groundwater measurements is included in Section 2 section.

BSC February 13, 2024: No response required.

- Near the existing wetlands, the lowest surveyed elevation shown in the drawings is 3.0-feet. The water surface elevation of the wetland should correlate to the groundwater elevations observed in the test pits. The measured groundwater table varies locally by as much as 4.5-feet between measurements, which is concerning for infiltration as a stormwater management strategy.

  While the measurements of the groundwater table varied in elevation across the site, the highest estimated seasonal groundwater elevation (3.98) was used for the conservative design of all of the infiltration systems. This ensures that 2-feet of separation to groundwater will be provided at a minimum across the site. This elevation corresponds well to elevations at the bordering vegetated wetlands (BVW) and observed conditions in the BVW.

  [Hatch response; February 7, 2024] No further comment. The comment may be considered closed.

  BSC February 13, 2024: No response required.

- Infiltration as a stormwater practice is challenging for many stormwater site designs near wetlands due to high groundwater tables. Therefore, establishing the seasonal high groundwater table is extremely important.

  As noted in previous comments, the estimated high seasonal groundwater elevations were determined in accordance with the Massachusetts Stormwater Handbook.

  [Hatch response; February 7, 2024] No further comment. The comment may be considered closed.

  BSC February 13, 2024: No response required.

- The water surface elevation and regulatory water levels of the wetland should be labeled on the plans and in the Stormwater Report.

  This information is not required under the Wetlands Protection Act and does not provide any discernable value to determining groundwater elevations. In addition, the term "regulatory water levels of the wetland" are not defined or included in the Wetlands Protection Act, so it is not clear what would be noted on the plans. As noted in responses above, groundwater elevations were determined in accordance with the requirements of the Stormwater Handbook in the Spring of 2023, and the most conservative value found was utilized for all infiltration systems on site.

  [Hatch response; February 7, 2024] No further comment. The comment may be considered closed.

  BSC February 13, 2024: No response required.

2.6 Standard 5: Higher Potential Pollutant Loads (HPPL)

- We concur with the applicant's stormwater report that Standard 5 is not applicable to the project site as the site use is not consistent with a land use with higher potential pollutant load (LUHPPL).

  No response required.

2.7 Standard 6: Critical Areas

- The Massachusetts DEP has <u>not</u> identified the project site as a(n):
  - Outstanding Resource Water,
  - Public water supply (Zone Is, Zone IIs and Interim Wellhead Protection),
  - Bathing beach,
  - Cold-water fishery,

- Shellfish growing area.

We concur with the applicant's stormwater report that Standard 6 is not applicable to the project site.

No response required.

2.8 Standard 7: Redevelopment Projects

- We concur with the applicant's stormwater report that Standard 7 is not applicable to the project site as the project is a new development.

  No response required.

2.9 Standard 8: Erosion, Sediment Control

- Street cleaning, such as street sweeping or shoveling, should be included to periodically to remove sediment that may have been tracked out of the project site, beyond the construction access. Street cleaning will be especially important following the saw cuts on Dorothy Road.

  The Construction Period Pollution Prevention Plan included in the Stormwater Report has been revised to include street cleaning at the end of each day as a requirement during construction.

  [Hatch response; February 7, 2024] This comment is considered closed.

  BSC February 13, 2024: No response required.

2.10 Standard 9: Operation and Maintenance Plan

- Per Massachusetts Stormwater Standards, an estimate of the annual O&M budget shall be provided in Section 4.0 *Long-Term Pollution Prevention & Operation and Maintenance Plan* of the Stormwater Report.

  An estimated O&M budget has been added to the Long-Term Pollution Prevention and Operation and Maintenance Plan included in the Stormwater Report.

  [Hatch response; February 7, 2024] This comment is considered closed.

  BSC February 13, 2024: No response required.

- If using asphalt shingles on the townhomes, the loose grit be collected and disposed of, following construction, and prior to 6" roof drains being connected to the infiltration basin.

  A note has been added to the Construction Period Pollution Prevention Plan included in the Stormwater Report (Section 3.7) that specifies that roof drains shall be connected to the infiltration basins after the area has been cleaned to prevent loose material from the shingles from entering the drainage system.

  [Hatch response; February 7, 2024] This comment is considered closed.

  BSC February 13, 2024: No response required.

- Long term operation and maintenance for the on-site infiltration basins (both Stormtrap and R-Tank^{XD} systems) must be provided. The O&M Plan should include the following provisions:

  - maintain an operation and maintenance log for the last three years, including inspections, repairs, replacement and disposal (for disposal, the log shall indicate the type of material and the disposal location),
  - make this log available to MassDEP and the Conservation Commission upon request; and
  - allow members and agents of the MassDEP and Conservation Commission to enter and inspect the premises to evaluate and ensure that the responsibility party complies with the Operation and Maintenance Plan requirements for each BMP.
  - As the stormwater BMPs serve more than one lot, the applicant shall include with the Notice of Intent a mechanism for implementing and enforcing the Operation and Maintenance Plan. The

applicant shall identify the lots or units that will be serviced by the proposed stormwater BMPs. The applicant shall also provide a copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of the legal responsibility for the operation and maintenance of stormwater BMPs.

The provisions noted above have been added to the Operation and Maintenance Plan included in the Stormwater Report. Please note that O&M provisions for the infiltration systems were already in the O&M Plan under "Underground Infiltration System". In addition, it should be clarified that all of the buildings in the Project (the 62+ building as well as the town homes) will be located on the same lot with ownership structure as condominiums. The responsible party for maintenance will be the condominium association. Upon establishment of the association, specific contact information can be provided.

[Hatch response; February 7, 2024] This comment is considered closed.

BSC February 13, 2024: No response required.

2.11 Standard 10: Illicit Discharges

- The review has not identified any proposed illicit discharges. We concur with the applicant's stormwater report that Standard 10 is not applicable to the project site.

  No response required.

- An unsigned Illicit Discharge Compliance Statement was provided in the Notice of Intent. The Illicit Discharge Compliance Statement should be signed prior to this issuance of permits.

  The Illicit Discharge Compliance Statement included in the NOI will be signed by the property owner prior to the issuance of an Order of Conditions.

  [Hatch response; February 7, 2024] This comment is considered closed.

  BSC February 13, 2024: No response required.

2.12 Miscellaneous Comments

- Arlington Land Realty address report on the title page of the Thorndike Place Notice of Intent drawing package is inconsistent with the address for the same reported in other reviewed submittal packages.

  Addresses provided on the Site Plans reference an old address for Arlington Land Realty while all other documents reference the current address. If required, a final set of Site Plans with the current address can be provided prior to issuance of an Order of Conditions.

  [Hatch response; February 7, 2024] No resubmittal to address this comment is required, comment is considered closed.

  BSC February 13, 2024: No response required.

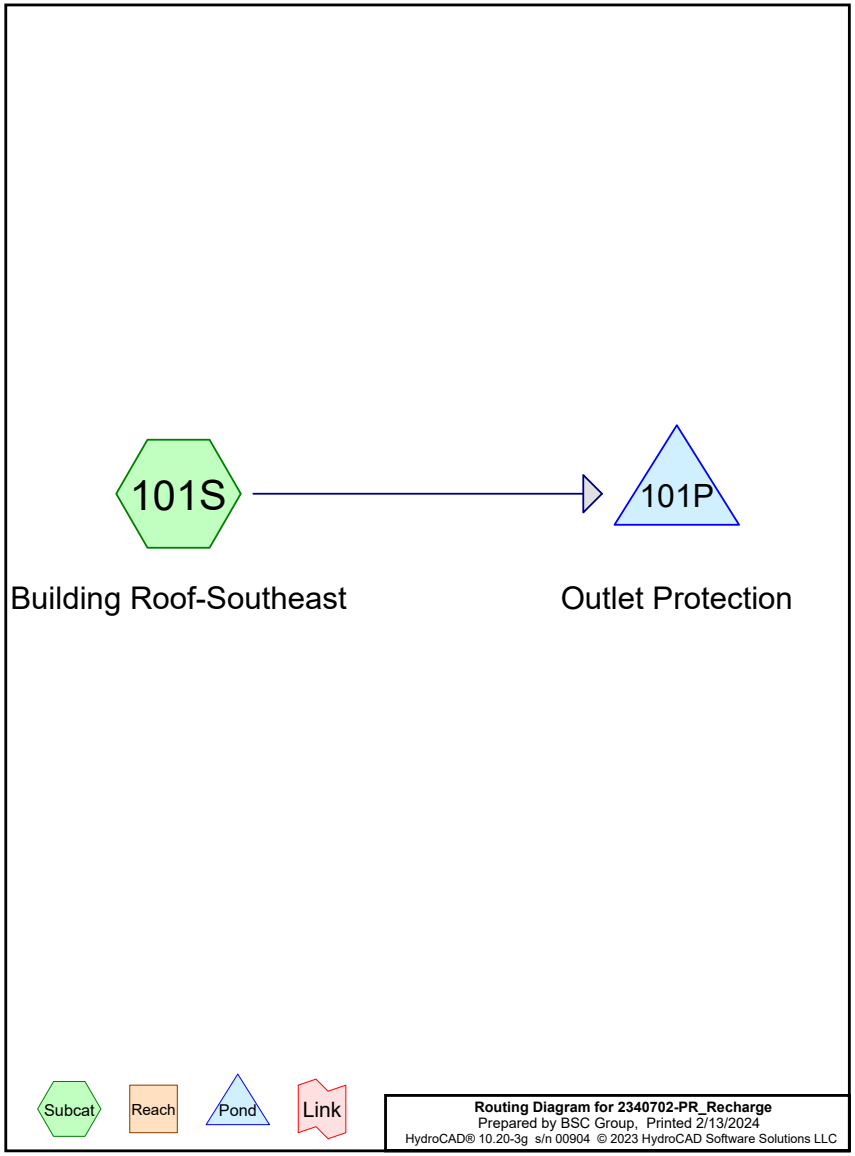
We believe that these responses fully respond to all open comments from the stormwater peer review. We look forward to discussing this project with you further at the upcoming public hearings on the project. Please feel

free to contact me at (617) 896-4386 or drinaldi@bscgroup.com should you have any questions on the information in this report.

Sincerely,
BSC GROUP, INC.

Dominic Rinaldi, PE
Senior Associate

Attachments: Velocity Calculations for Roof Discharge



Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-Year	Type III 24-hr		Default	24.00	1	11.50	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
14,140	98	Roofs, HSG C (101S)

Summary for Subcatchment 101S: Building Roof-Southeast

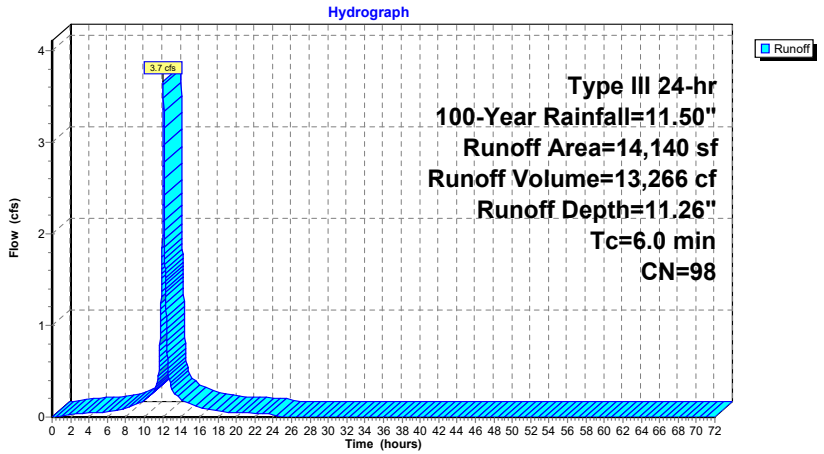
Runoff to Pond 101P: 3.7 cfs @ 12.08 hrs, Volume= 13,266 cf, Depth=11.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=11.50"

Area (sf)	CN	Description
14,140	98	Roofs, HSG C
14,140		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc**

Subcatchment 101S: Building Roof-Southeast



Summary for Pond 101P: Outlet Protection

Inflow Area = 14,140 sf,100.00% Impervious, Inflow Depth = 11.26" for 100-Year event
Inflow = 3.7 cfs @ 12.08 hrs, Volume= 13,266 cf
Outflow = 3.7 cfs @ 12.08 hrs, Volume= 13,250 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.7 cfs @ 12.08 hrs, Volume= 13,250 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 7.43' @ 12.08 hrs Surf.Area= 23 sf Storage= 16 cf

Plug-Flow detention time= 1.7 min calculated for 13,250 cf (100% of inflow)
Center-of-Mass det. time= 0.8 min (738.0 - 737.2)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	16 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	9	0	0
7.00	23	16	16

Device	Routing	Invert	Outlet Devices
#1	Primary	7.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=3.7 cfs @ 12.08 hrs HW=7.43' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 3.7 cfs @ 1.71 fps)

1.71 ft/sec is a non-erosive velocity for vegetated areas downstream of the outlet protection

Pond 101P: Outlet Protection