



September 16, 2025

Town of Bellingham Planning Board
c/o Robert Lussier, Director of Planning and Engineering
10 Mechanic Street
Bellingham, MA 02019

Via: Email to rlussier@bellinghamma.org

Reference: Peer Review – Stormwater and Engineering
Blackstone Street Improvements
Bellingham, Massachusetts
B+T Project No. 3608.01

Dear Members of the Board:

Beals and Thomas, Inc. (B+T) is pleased to assist the Town of Bellingham Planning Board (the Board) with its review of the stormwater management system and general engineering design for the proposed Blackstone Street Improvements (The Project) located on Blackstone Street (the Site or Property) filed by Wall Street Development Corp (the Applicant).

We have reviewed the Applications for Stormwater Management and Development Plan Approval Under the Zoning Bylaw and associated documentation with respect to the requirements of the Town of Bellingham Bylaws, Chapter 245-13 – Stormwater Management, Town of Bellingham Procedural Rules, and the Massachusetts Wetlands Protection Act, MGL c. 131, §40 310 CMR 10.00 (the Act) as it relates to the MassDEP Stormwater Handbook standards.

B+T received the following documentation which served as the basis for our review:

- Plan entitled *Blackstone Street Improvements*, dated February 14, 2025, revised June 20, 2025, prepared by Allen Engineering & Associates, Inc. (12 sheets)
- Document entitled *Drainage Analysis for Blackstone Street Improvements*, dated February 14, 2025, revised June 20, 2025, prepared by Allen Engineering & Associates, Inc.
- *Application for Stormwater Management Permit Under Zoning Bylaw*, dated June 24, 2025.
- *Application for Development Plan Approval Under the Zoning Bylaw*, dated June 24, 2025.

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Our comments are as follows:

Town of Bellingham Procedural Rules

1. Please provide a dedicated Erosion and Sediment Control Plan in accordance with the Procedural Rules. While the Applicant acknowledges that a Stormwater Pollution Prevention Plan (SWPPP) will be required per the NPDES Construction General Permit, one has not been provided at this time. The SWPPP would serve as the Erosion and Sediment Control Plan. The Erosion and Sediment Control plan should depict erosion and sediment controls, temporary sedimentation basins, temporary seeding/stabilization, stockpile areas, waste materials to be temporarily stored onsite, and construction sequencing/phasing. The plan would also include additional information, including soil erodibility, steep slope delineation, and critical habitats. Refer to the Procedural Rules for additional required information. (§7.8.1)
2. We request the Applicant depict specimen trees 12" and larger in diameter proximate to the work area on the plan. (§7.8.1(C)2)
3. The number of the mature trees to be removed shall be minimized. The existing trees to be retained and protected shall be suitable if there is an average of one 4"-caliper (or larger) tree per 30 feet of individual lot frontage as identified by the Tree Warden. (§7.9.1(B)). We request the Applicant provide a narrative documenting compliance with the regulation.
4. The Erosion and Sediment Control Plan shall include property/right-of-way/easement lines with metes and bounds. (§7.8.1(H))
5. Provide the timing, schedules, and sequence of development including clearing, stripping, rough grading, construction, final grading, and vegetative stabilization. (§7.8.2(P))
6. Provide an Operation and Maintenance Plan in accordance with the Procedural Rules. While some best management practice maintenance information was provided in the report, the items outlined in Standard 9 of the Checklist for Stormwater Report should be provided. The Procedural Rules emphasize respective easement information shall be included, as well. (§7.8.3)
7. Stormwater management systems shall be designed to remove at least 90% of the annual pollutant load of Total Suspended Solids (TSS). Note, this requirement is above the standard 80% TSS removal rate required by MassDEP (and proposed by the Applicant). The Procedural Guidelines require 60% removal of the average annual load of Total Phosphorus is also required. As the three proposed basins retain and infiltrate runoff from the impervious areas routed to them, the requirement for Total Phosphorus is likely met, but the Applicant should document compliance. (§7.9.1(C)1)

8. The hydrology calculations utilize storm events from the NOAA Atlas 14 though the Wetland Regulations (§247-33.B(7)) suggest the Cornell Method (or equal). We note the depths associated with the 2, 10, & 25-year NOAA Atlas 14 storms (3.38", 5.23" and 6.38", respectively) are greater than those of the Cornell Method (3.26", 4.89" and 6.16"), with the exception being the 100-year storm (8.75" vs. 8.16" for NOAA 14). (§7.9.2(B))
9. The proposed culverts shall safely pass the design storm (50-year rational storm event, at a minimum) based on MassDOT roadway functional classification. Adequate erosion protection shall be designed, as well. Rational calculations for the proposed culverts have not been provided. (§7.9.2(L))

Subdivision Regulations - Stormwater Management §245-13

1. Section 7.9 of the Town of Bellingham Procedural Rules requires the applicants must meet the drainage requirements specified in the Rules and Regulations governing the Subdivision of Land as well as the Massachusetts Stormwater Management Standards. We offer the following comments relative to the Subdivision rules related to stormwater.
2. Post-development peak rates of runoff shall not exceed pre-development at the boundaries of the development. We defer to the Board if the resource area constitutes the boundary. If so, subcatchments and the respective time of concentration flow paths shall be adjusted accordingly. (§245-13.A.(2))
3. The Rational Method shall be used for sizing pipes culverts. (§245-13.A.(3))
4. The vernal pool should be considered a hydrologic evaluation point (ultimately routed to EV1) as it impounds runoff. Modify the subcatchment boundaries and time of concentration flow paths accordingly.
5. Please confirm the time of concentration flow path for existing (pre-development) subcatchment 3S. The path traverses a low point below the 310-contour before apparently climbing above the 312-contour elevation across the unimproved way. It is not clear if there is an existing culvert in this location. A calculation to determine if this area constitutes Isolated Land Subject to Flooding may be warranted.

6. The basin sediment forebays are modeled as separate ponds routed (in series) to the respective basins. It appears the intent was to model the forebays with the gabions modeled as weirs overflowing to the primary basin storage volumes, less the associated forebay volumes (at the respective stages). However, we request the Applicant confirm the contour areas in the HydroCAD Pond Summaries. For example, the area at upper elevation 288.50 for Basin #1 does not appear to include the area over the forebay; and the area at lower elevation 289.0 for Basin #3 appears to include the forebay footprint. Furthermore, runoff would likely flow right through the stone gabion voids, providing little to no actual retention within the forebay. Even if impermeable, the gabion would classify more as a broad-crested weir (as opposed to sharp-crested, which are relatively thin). We recommend the calculations be revised to accurately model the basin.
7. The stormwater conveyance system shall use the rational formula for determining pipe and culvert sizes. The hydrologic calculations models the pipes at reaches, though the tributary flows are not based on rational storm events. (§245-13.A.(3))
8. Detention basin berm (fill) slopes shall not exceed 4:1 (horizontal to vertical) and it appears the basin side slopes are proposed at 3:1 throughout. (§245-13.A.(3))
9. We request the Applicant revise the catch basin construction detail to clearly specify curb inlets (noting transition sections) as well as specifying SNOUT hoods (or equal). The LeBaron models depicted are no longer available.
10. A 6-foot chain link fence is required around the proposed basins. The construction detail depicts a 4-foot-high fence. (§245-13.D.(2)(g))
11. The Operation and Maintenance Plan shall include an estimated annual cost to maintain the stormwater management system and the Applicant is required to submit sufficient funds to cover these expenses for ten years. (§245-13.D.(2)(h))
12. The soil tests for the proposed stormwater basins were performed November 5th and 6th of 2025. Deep tests shall be made between February 15th and May 15th. (§245-13.D(2)(b))
13. Basin depth shall not exceed five feet. Infiltration Basin #1 has a depth of 7.5 feet from the bottom of the basin to the top of the berm, though the ponding depth does not appear to exceed five feet. It is unclear as to why the basin is approximately three feet deeper than the 100-year maximum ponding depth. (§245-13.D(2)(a))
14. We request the Applicant include a construction detail for the roadside swales consistent with the regulations. (§245-13.F(3))

15. The post development subcatchment boundaries associated with the proposed roadway are difficult to ascertain on the Proposed Drainage Plan (1"=150' scale). We recommend the Applicant provide a separate plan of these areas at a more conducive scale.
16. We request the Applicant provide recharge, drawdown, forebay sizing, and water quality volume calculations for Basin #3.
17. The Checklist for Stormwater Report erroneously indicates there is no disturbance to any Wetland Resource Areas (under LID Measures), though the project includes wetland fill.
18. While not checked on the Checklist for Stormwater Report, it appears the site is subject to the 44% TSS pretreatment requirement for Standard 4. The requirement is met given the deep sump catch basins being routed to the forebays. The Water Quality Volume depth should be checked.

Wetland Regulations - Stormwater Compliance §247-33

1. The Regulations require three testing locations for each basin. There were three tests performed in and around Infiltration Basin #1. Two were performed in the vicinity of Infiltration Basin #2. While this testing may be adequate for these two basins (given the size and findings), there is no soil testing information for Basin #3. (247-33.B(2)).
2. We request the Applicant confirm the emergency spillways are designed to pass the 100-year inflow rate with 6" of freeboard to the top of berm (i.e. basin in failure (§247-33.B(4))

General Engineering

1. There are roadway centerline grades proposed at 10%, though the Subdivision Rules and Regulations (§245-12.E.(2)) specify an 8% maximum. We note this for the benefit of the Board and understand the Applicant is not filing a Definitive Subdivision Plan.
2. There are no sidewalks proposed. While we understand the Applicant is not filing a Definitive Subdivision Plan, a subdivision road would require a sidewalk per the Rules and Regulations (§245-15(A)(2)). The proposed roadway is a $1,900 \pm$ foot dead-end with restricted pedestrian access at wetland crossing approximately 250 to 500 feet west of the intersection with the existing road.

3. The rate of curvature (K) values for some of the proposed vertical curves are appropriate only for speeds up to approximately 25 miles per hour. For example, the crest curve at STA 11+15 has a K=13.2 (design K=12 for 25 MPH per MassDOT Exhibit 4-26) and the sag at STA 15+25 has a K=21.7 (design K=26 for 25 MPH). We defer to the Board as to if there will be a posted speed limit or the Town speed limit of 25 MPH in thickly settled or business districts would apply.
4. There does not appear to be adequate space to install the retaining wall in the vicinity of the wetland/vernal pool, especially along the southern wall. There appears to be approximately two feet between the face of the wall and sediment control barrier and there appears to be a one-foot toe per the wall detail. We request the Applicant provide a narrative on the anticipated retaining wall construction.
5. Two existing culverts were observed below Blackstone Street connecting the WF-A and B Series wetlands but are not indicated on the plan. We request that the Applicant revise the plans to depict these features.
6. Sediment control barriers should be provided/extended to areas downgradient of proposed earthwork/trenching. For example, along the eastern perimeter of the drainage easement to Infiltration Basin 1, south of the roadway off-grading west of STA 7+00±, and around Infiltration Basin 2 and associated easement.
7. The proposed 2-foot high box culvert (at STA 3+45) appears as if it will have one foot of substrate placed within (per the roadway profile and invert elevation). Please provide a construction detail specific to the culvert and confirm this is the intent. If so, this will leave a relatively shallow one-foot-high opening. Please provide an operation and maintenance plan outlining measures to keep the culvert clear and functional in the wooded environment. It is also unclear how the substrate will be placed within the 37± foot culvert length, if that is the intent.
8. The proposed 10-foot-wide box culvert appears as if it may have as little as 10 square feet of open area. Comparatively, the existing low point along the roadway extends at least 100 feet and excess runoff could theoretically crest over this length. Please confirm how the proposed culvert was sized and that it has adequate hydraulic capacity to convey any overflow from the vernal pool and wetland. Hydraulic analyses and water budgets may be warranted to demonstrate there are no adverse effects on the vernal pool or the wetlands.
9. There are multiple existing culverts crossing beneath the unimproved way providing hydraulic connections between the wetland systems proximate to the vernal pool. Please evaluate and provide documentation demonstrating the proposed design (consisting of the single box culvert) is consistent with the existing wetland hydrology.

10. We recommend the Applicant investigate whether the proposed water main be insulated where it crosses beneath proposed culverts, as there is less than 5-feet of separation to the open-air.
11. Several stormwater drain pipes are proposed at slopes of 10%, including the 12" HDPE outlet pipe from DMH 3 and the 15" HDPE outlet pipe from DMH 5. This results in maximum flowing full velocities of 14.4 and 16.7 feet per second, respectively. Standard engineering practice is for maximum velocities to not exceed 12 feet per second.
12. We request that the Applicant extend the ends of the gabion at Infiltration Basin 3 to the 291± contour elevation.
13. We request the Applicant provide maximum 100-year storm water surface elevations within the Basin Elevation Schedule on the Stormwater Collection and Infiltration Basin detail on C-11. In accordance with the Bellingham Wetlands Regulations Section 247-33.B(3), basins shall be designed with a minimum one foot of freeboard from the 100-year ponding elevation to the emergency spillway. Standard engineering practice dictates an additional one foot of freeboard above the emergency overflow spillway to the top of berm. Also, please revise this detail to delete what appears to be an erroneous top of berm elevation of 216.60.
14. We request the Applicant consider proposing outlet control structures at each of the infiltration basins, in accordance with the MassDEP Stormwater Handbook. The design is dependent upon the infiltrative capacity of the soils. Under frozen/frost conditions, the basins may not dewater within 72 hours as required by the MassDEP Stormwater Management Policy.
15. We recommend the Applicant propose a free-draining loam for the bottom of the infiltration basins. The loam shall not impede infiltrative capacity.
16. We recommend drawdown devices be proposed to dewater each of the basins for maintenance, in accordance with the MassDEP Stormwater Handbook.
17. The paved widths on the roadway details on sheet C-11 are inconsistent with the notes. Assuming binder is paved 1.5 feet beyond traveled way, the binder width would be 25 feet (not 23 feet) to support the bituminous berm. Revise the roadway cross-sectional details to depict accurate pavement widths including pavement below the berm.

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B+T is available to attend the public hearing, upon request, to present the results of our review and be available for discussion regarding the comments listed herein.

Thank you for the opportunity to assist the Town of Bellingham with the review of the Stormwater Management Permit and Development Plan Approval Applications. Feel free to contact our office with any questions.

Sincerely,

BEALS AND THOMAS, INC.



Thomas J. Michalak, PE
Senior Civil Engineer

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